

THE INTERNATIONAL JOURNAL OF ORGANIZATIONAL INNOVATION

VOLUME 3 NUMBER 2 FALL 2010

TABLE OF CONTENTS

	Page:
2010 Board Of Editors	4
Articles:	
Intercultural Communication Challenges And Multinational Organization Communication - Dr. Pranee Chitakornkijasil	6
Innovation In Education: So What Else Is New? Reaching The Individual Student - Dr. Valerie Maxwell	21
Managing Innovation: A Typology Of Theories And Practice-Based Implications For New Zealand Firms - Anton De Waal, Alex Maritz and Chich Jen Shieh	35
Knowledge Sourcing Behavior: A Theoretical Model Based On Knowledge Base And Network Relationship Perspectives - Chien-Hsiung Lin	58
The Role Of Work, Satisfaction, Achievement And Self-Realization - Ching-Hsiang Liu	70
A Study On Relationships Between Principal's Transformational Leadership And Physical Education Teachers' Teaching Performance In Taipei Elementary Schools - Weiyang Huang and Chinglung Hsieh	80
Disaster And Risk Management In A Global World - Dr. Pranee Chitakornkijasil	97
A Study On The Differences In Image Memory And Preference Between Male And Female Visual Cognition - Shou-Fang Liu, An-Sheng Lee, Jenn-Yang Lin, Yo-Wen Liang and Wen-Ching Su	114

Negotiating With The Chinese And Emerging Domestic Competition - Dr. Pranee Chitakornkijasil	129
An Analysis Of Essential Competencies Of Hotel First Level Supervisors - Peir-Yuan Patrick Li and Fu-Jin Wang	140
Risk And Uncertainty Of Enterprise During Dynamic Environmental Changes - Dr. Pranee Chitakornkijasil	162
Theory And Practice Of Residential Areas' Street Configuration And Burglary Vulnerability: A Review Of The Literature - Massoomeh Hedayati Marzbali, Dr. Aldrin Abdullah and Mohammad Javad Maghsoodi Tilaki	178
Research On Tv Advertising Effectiveness Of The Taiwan Super Basketball League - Li-Yun Chan, Maw-Song Su and Chi-Ming Huang	199
Broad Perspective And Framework Of Quality Of Work Life - Dr. Pranee Chitakornkijasil	214
A Study Of Taiwanese College Teachers' Acceptance Of Distance Learning - Chih-Hsing Wang, Wen-Liang Liu, Meng-Chun Tseng and Hung-Sung Tsai	243
The Influence Of Knowledge Workers On Occupational Commitment - Chih-Chung Chen, Yao-Sheng Hsu, Feng-Cheng Tung and Ming Shing Lee	261
Bureaucrat, Support And Innovation Promote Interpersonal Relationship In Organization - Hung-Wen Lee	285
From Successful Innovation To Market Profitability - Yun Ken and Tung-Yu Tsai	293
Enterprise Risk Management - Dr. Pranee Chitakornkijasil	309
An Enquiry Into "Hollowing Out Effects" In Home Exports, Technology Innovation, And Employment: A Study Of Taiwanese Enterprises To China - Ting Ling Lin, Wen Chung Hsu, Hsin Mei Lin and Ching I Chen	338
The Study On The Relationship Among Experiential Marketing, Service Quality, Customer Satisfaction And Customer Loyalty - Ming-Shing Lee, Huey-Der Hsiao, Ming-Fen Yang	352
The Internationalization Of Human Resource Management In The Host Nation Context & Strategic Approach Of IHRM - Dr. Pranee Chitakornkijasil	379
A Graph-Based Approach For Mining Closed Large Itemsets - Lee-Wen Huang and Ye-In Chang	401

A Fit Perspective: A Critical Factor To Communication Marketing - 416
Dong-Jenn Yang, Chen-Yin Liu, Hsiung-Peng Huang and Shu-Wan Yang

A Study Of The Application Of The Koch Curve And Fuzzy Theory 438
On The Computer Aided Design Of Furniture - An-Sheng Lee

ABOUT *THE INTERNATIONAL JOURNAL OF ORGANIZATIONAL INNOVATION*

The International Journal of Organizational Innovation (IJOI) (ISSN 1943-1813) is an international, blind, peer-reviewed journal, published online quarterly . It may be viewed online for free. It contains a wide variety of research, scholarship, educational and practitioner perspectives on organizational innovation-related themes and topics. It aims to provide a global perspective on organizational innovation of benefit to scholars, educators, students, practitioners, policy-makers and consultants.

Submissions are welcome from the members of IAOI and other associations & all other scholars and practitioners.

To Contact the IJOI Editor, email: drfdembowski@aol.com

For information regarding submissions to the journal, go to: <http://ijoi.fp.expressacademic.org/>

For more information on the International Association of Organizational Innovation, go to: <http://www.iaoiusa.org>

The next Annual Conference of IAOI will be held in Kuala Lumpur, Malaysia, July 27 - 29, 2011. For more information regarding the conference, go to: <http://www.iaoiusa.org/2011icoi/index.html>



BOARD OF EDITORS - OCTOBER 2010

Editor Position	Name	Affiliation
Editor-In-Chief	Frederick Dembowski	International Association of Org. Innovation
Associate Editor	Chich-Jen Shieh	International Association of Org. Innovation
Associate Editor	Kenneth E Lane	Southeastern Louisiana University
Assistant Editor	Alan E Simon	Concordia University Chicago
Assistant Editor	Aldrin Abdullah	Universiti Sains Malaysia
Assistant Editor	Alex Maritz	Australian Graduate School of Entrepreneurship
Assistant Editor	Andries J Du Plessis	Unitec New Zealand
Assistant Editor	Asoka Gunaratne	Unitec New Zealand
Assistant Editor	Barbara Cimatti	University of Bologna
Assistant Editor	Carl D Ekstrom	University Of Nebraska at Omaha
Assistant Editor	Catherine C Chiang	Elon University
Assistant Editor	Donna S McCaw	Western Illinois University
Assistant Editor	Earl F Newby	Virginia State University
Assistant Editor	Fawei Geng	University of Oxford
Assistant Editor	Fuhui Tong	Texas A&M University
Assistant Editor	Gloria J Gresham	Stephen F. Austin State University
Assistant Editor	Hassan B Basri	National University of Malaysia
Assistant Editor	Hsin-Mei Lin	National Chinan University
Assistant Editor	Hui Chun Chan	Fortune Institute of Technology
Assistant Editor	Hui Heng Chen	Fortune Institute of Technology
Assistant Editor	Janet Tareilo	Stephen F. Austin State University
Assistant Editor	Jeffrey Oescher	Southeastern Louisiana University
Assistant Editor	Jen-Shiang Chen	Far East University
Assistant Editor	Jian Zhang	Dr. J. Consulting
Assistant Editor	John W Hunt	Southern Illinois University Edwardsville
Assistant Editor	Julia N Ballenger	Stephen F. Austin State University
Assistant Editor	Jun Dang	Xi'an International Studies University
Assistant Editor	Jyh-Rong Chou	Fortune Institute of Technology
Assistant Editor	Ken Kelch	Alliant International University
Assistant Editor	Ken Simpson	Unitec New Zealand
Assistant Editor	Lee-Wen Huang	National Sun Yat-Sen University
Assistant Editor	Marcia L Lamkin	University of North Florida
Assistant Editor	Michael A Lane	University of Illinois Springfield
Assistant Editor	Nathan R Templeton	Stephen F. Austin State University
Assistant Editor	Nor'Aini Yusof	Universiti Sains Malaysia

(Board of Editors, Continued)

Editor Position	Name	Affiliation
Assistant Editor	Opas Piansoongnern	Shinawatra University, Thailand
Assistant Editor	Pattanapong Ariyasit	Sripatum University
Assistant Editor	Pawan K Dhiman	EDP & Humanities, Government Of India
Assistant Editor	Rajinder K Uppal	Panjab University, Chandigarh
Assistant Editor	Ralph L Marshall	Eastern Illinois University
Assistant Editor	Rayma L Harchar	University of Louisiana at Lafayette
Assistant Editor	Robert A Davis	Unitec New Zealand
Assistant Editor	Ronald Leon	Cal Poly Pomona University
Assistant Editor	Sandra Stewart	Stephen F. Austin State University
Assistant Editor	Shang-Pao Yeh	I-Shou University
Assistant Editor	Siti N Othman	Universiti Utara Malaysia
Assistant Editor	Sudhir Saksena	DIT School of Business, India
Assistant Editor	Thomas A Kersten	Roosevelt University
Assistant Editor	Thomas C Valesky	Florida Gulf Coast University
Assistant Editor	Wen-Hwa Cheng	National Formosa University
Assistant Editor	Ying-Jye Lee	National Kaohsiung University of Applied Sciences
Assistant Editor	Yung-Ho Chiu	Soochow University
Assistant Editor	Zach Kelehear	University of South Carolina

INTERCULTURAL COMMUNICATION CHALLENGES AND
MULTINATIONAL ORGANIZATION COMMUNICATION

Note: This paper was awarded as "The Outstanding Paper" at the International Conference on Organizational Innovation, Bangkok, Thailand, August 2010

Dr. Pranee Chitakornkijasil
Graduate School of Business Administration
National Institute of Development Administration (NIDA), Bangkok 10240 Thailand.
wayne.s@nida.ac.th

Abstract

In this study, intercultural communication challenge is considered. Later, the business context and intercultural communication are addressed. This is followed by importance of cross-cultural communication study. Besides, we explain barriers to effective cross-cultural communication. Communication in the export-import activities is elaborated. Finally, Communication in teams is studied. A topical bibliography is provided.

Keywords: Communication, Intercultural, Multinational Organization.

Introduction

Intercultural Communication Challenge

Learning to understand people whose background is diverse from our own is not an easy assignment. That challenge is to become an effective and successful intercultural communicator as we communicate with neighbors who might speak a “strange” language or a business partner who stops in the middle of a meeting. To be successful in communicating with the thousands of others we can face with the new global economy, we should communicate with people whose entire backgrounds, whose very method of viewing the world and doing things, may be different from us. The functioning of this new world refers to intercultural communication.

Intercultural communication means that people from different cultural backgrounds interact with one another. Cultural differences can create potential to make intercultural communication very difficult, and sometimes impossible. Culture strongly affects values, beliefs, world views, nonverbal behavior, language, and how to have relationship with others.

Intercultural Business and Communication Context.

Most nations are tied to an international system of economic interdependence, and most nations have at least one asset within their borders that is needed by another country. No nation is absolutely self-sufficient. Markets and cultures continued to converge, and major enterprise have seized the opportunity to go global. This results in augmented foreign competition. International corporations increasingly participate in various international business arrangements involving joint ventures between two or more organizations that share in the ownership of a business undertaking. Global competitors face both abroad and at home as tariffs are reduced, markets are deregulated. Cross-cultural collaboration and teamwork are important an organization’s success.

There are various issues when living or working in a foreign environment.

Communication across cultures is difficult. A critical impact of business globalization is the development of diversity in the workers. Effective global enterprise communication skills are the backbone that supports the transaction of business around the world. Managers working global business develop cultural acquire and fluency cultural-sensitive communication tools. The development of managerial communicative skills is challenging because management can be viewed differently from culture to culture.

Importance of Cross-Cultural Communication Study

Communication covers all aspects of organization activity. It's the process by which things are achieved in global organizations. For global managers, effective communication is a crucial skill because the manager's planning, organizing, monitoring and facilitating functions become operational zed only through communication. Cross-cultural communication creates when two managers from different cultures exchange meanings in both verbal and nonverbal ways. Every international manager is a communicator. Everything an international manager says and does communicates something in some way to some group or somebody. Cross-cultural communication happens when two managers from different cultures exchange meanings with one another. Verbal communication is the primary ways to encode a message. The communicator is able to convey a great deal of additional information through tone of voice, facial expressions, postures, gestures, use of personal space, punctuality, eye contact. A challenging area for global managers is the encoding and decoding of messages so that their original meaning is interpreted in the correct way. Proactive steps by both the receiver and communicator shall improve the overall cross-cultural communication process. In addition, feedback is sought by the communicator to assess whether the original message is received as intended. If not, follow-up

messages must be sent. Most transnational managers, after getting to know individuals from a different culture, are left with the impression that it is hard to categorize host-country nationals' behavior into a simple communicate effectively with vendors, customers, government officials, and other key stakeholders in host countries, knowledge about culture, communication style, and preferences is crucial. Unfortunately, many global organizations do not provide adequate cross-cultural and language training to their soon to be global assignees. Such training programs can help international managers to understand their own culturally determined stereotypes and communication preferences in attempt to make them more accepting and understanding of the communication preferences of managers from different cultures. The more culturally different the receiver's culture is from that of the communicator's, the more likely misinterpretation shall happen as the "Global Focus" issues are especially essential when virtual team members are from diverse cultures and spread out geographically.

Barriers to Effective Cross-Cultural Communication

Major barriers to effective cross-cultural communication come from: differences in spoken language, the extent to which information is exchanged, the use of nonverbal behavior, and consideration of time. Approximately 6,000 languages are used in the world today. Global managers are required to communicate in a second or third language that both individuals shall understand. Regardless of one's fluency in that second or third understanding and language of the receiver's host culture, miscommunications and cross-culture misunderstanding are still likely to happen. To prevent issues from happening, successful international managers in the 21st century need to be able to communicate in the language of their customer, no matter where that customer is located. Before one can conclude that English is sufficient to engage in most international business activities, global managers are required to consider the number and

languages of the nations they shall be working with and the degree of interaction with host-country nationals. Facial expressions is an essential in a global manager's daily interpersonal dealings with individuals from other cultures. Global managers can have cross-cultural communicators achieve two tasks. First, they ought to improve message and information they wish to send. Second, they ought to seek to improve their own understanding of what people from other cultures are trying to communicate. International managers are able to take various steps to become more effective cross cultural communication. They are required to have an objective understanding of their own communication norms and culture. To be effective, global managers are required to step outside of their culture and see it from the perspective of a non-home-country national. Although many persons know that English is the language of world business and is sufficient for most common business transactions. But others argue that a global assignee should always speak the language of the customer. Every one tries to make global assignees to learn the host-country language. This is especially important for managers who will be working and living in a host country for extended periods. For others persons who visit multiple countries each year and spend only a few weeks in each, then learning various key phrases such as "Good morning, my name is so and so," and "Hello, It's nice to meet you," "goodbye and thank you" shall help the global assignees function and gain the respect of the host-country nationals. Time pressures and travel schedules always mean that international managers cannot follow up their messages and encourage feedback every time they communicate with stakeholders from different cultures. Under such circumstances, an atmosphere of mutual trust and confidence between managers from diverse cultures are able to encourage facilitate communication. In cultures that need longer time to know one another and more disclosure about one's personal life, the trust building always need several initial face-to-face visits before mutual

trust is able to be established. The managers resist to get down to business during the early visit and instead concentrate on building rapport and getting to know host-country nationals. He waited until they initiated business discussions and as a result was perceived as friendly, nice and can be trusted. Such guidelines is able to be useful to global managers. More important, however, is the decision to listen. Guidelines are useful if the manager makes the conscious decision to listen. Only after the realization that effective communication concerns understanding as well as being understood, the manager is able to guidelines for effective listening become useful. One of the best methods to encourage someone to express true feelings, emotions and desires, is to listen. But just listening is not good enough, one must listen with understanding.

Communication in Multinational Organization

Official communication comes from the field through the international division to the appropriate areas at headquarters and back. Communication can be efficient because all international communication goes through the international division. Nowadays an augmenting of the revenues of major companies in many nations comes from international activities. Competition over who is best is able to lead communication problems and a waste of resources. One group may withhold information for the benefit of a subgroup. Staffing affects communication networks. An enterprise that needs to ameliorate its intercultural communication should reexamine its staffing practices and patterns.

To minimize communication issues, a company can:

- Hire host country personnel who are familiar with the home country culture
- Have a mixture of home country and host country nationals in the subsidiary
- Build specialists in certain regions
- Train personnel in the international division in intercultural communication

Many companies from the Koreans, the French, the Germans, and the Japanese expect that their workers is able to adapt, function, and communicate in different culture environments. European companies expect that managers shall speak at least one foreign language fluently. In cultures in which loyalty is essential in the workers, those working for a foreign company experience a decrease in his ability to communicate effectively.

In the international organization, scholars agree that:

- Managers should adapt to the culture.
- Technical expertise is not enough.
- Language and cultural sensitivity are crucial.

A change to a global structure does not make a global person out of a domestic personnel. If the shift to a global structure is not prepared carefully, there shall be a lot of confusion, poor communication and bad decisions. Workers may know the product inside and out, but they have little or no background in the international distribution systems, international market, intercultural communication, and international sensitivities problems. They may evaluate international procedures on the basis of their domestic expertise and their self frame of reference criterion. They decide everything on the basis of their own backgrounds. A global company needs coordination, unity of command, and communication. Worldwide operations communicate to the appropriate functional managers, such as finance, marketing, and personnel, at headquarters. The difficulty is that communication is able to occur along specialized paths. A functional manager have not overview of the whole situation because he deals only with one functional aspect. They should communicate with staff in their areas of specialization around the globe but also should communicate with managers from other functional areas to coordinate

efforts. Various companies spend great effort on cross-functional training of their management staff to improve operations. The process needs adaptation and sensitivity to the different goals of the various functional areas and cultural orientations. The geographic structure coordinates operations within a region but always does not pay enough attention to coordination between regions. Communication between regions may be not enough because of different ethnic rivalries and languages. The communication system may be fragmented, and be difficult to pull all the regions together to share resources and exchange ideas. In the worldwide product structure, global communication relating to one product can be efficient but the communication between different product groups is able to be weak because each product has marketing channels and its own sales force. Communications are negatively affected by fragmentation and competition. As a company becomes a global company, the changes needed for communication shall be difficult for workers at headquarters but even more difficult for personnel in the field. Nowadays, workers in the subsidiaries must contact a various personnel production product, development, finance, marketing and sales. Communicator lacks of background in the firm and without intercultural communication skills shall have difficulty structuring the message appropriately and choosing the optimal channel. An effective global structure needs intercultural communication training. Product development team members are not able to consider just domestic problems they must plan and think globally. Advertising campaigns must not be planned with only the local market in mind the team ought to consider cultural, regulatory and, legal requirements in other markets. Although each one has major responsibility for a special segment of the advertising campaign, everyone requires to be aware of the overall strategy and know what is going on worldwide. They all must overcome their work as a team and differences. The communication needs are more critical if R&D and production are spread over several locations all over the world. A

number of companies possess R&D labs in several nations. In a global enterprise those labs must coordinate and communicate with each other. They ought to cooperate and be informed rather than compete for resources. Each segment ought to keep in mind the best interest of the company as a whole. The global structure can be very beneficial for international operations. Global organizations do not distinguish between international and domestic advertising budgets. Managers from around the world must communicate with each other. They must know each other's requirements, ways of doing things, and priorities. The staff in marketing, finance, and product development at headquarters ought to have a global outlook and understand the thought processes, values of the cultures, and customs in which the company does business. A global structure needs effective communication at headquarters and full integration of communication strategies on a global basis.

Communication in the IMPORT-EXPORT Activities

The first stages of international involvement do not need much international adaptation. For example, various companies begin their international experience by exporting through an import-export company. In the advanced stage of exporting the company can establish an export department in the company. Often, firms sell abroad because someone abroad wants the product. If the foreign market very requires the product, the adaptation in terms of culture, product, and language may be minimal. In the first exporting stage the company looks at itself as a domestic company that sells some of its production overseas, toward more international involvement. A growth export company shall adapt its products to specific markets and consider the foreign market an integral part of its business. The E-commerce and Internet have provided international markets to small firms. As soon as a business applies a web page, people around the world are able to view its services and product line. Online communication of a website must be

constructed with careful attention to cultural priorities to succeed in international markets. A small business can go through an import-export company or hire an agent. The managers of the company have no contact or little with the foreign markets. Company who use a foreign agent to represent it and distribute its products in foreign markets, it must be familiar with some of the legal issues in hiring, firing agents, and maintaining. Exporting company hire translators, go to trade fairs and shows, and advertise its products. The company shall be more interested in the technical aspects of exporting, for example shipping methods and letters of credit, than in cultural adaptations. Communication with the foreign market is passed by agent and interpreter. The level of adaptation can be dependent on the product. The product is standardized, the Coca-Cola Company must adapt its communication techniques and styles to the various communication styles and cultures of its bottlers around the world. The product is the same everywhere, the packaging, the bottle shapes and sizes, may vary. In its communication and operations in worldwide operations, Coca-Cola must adapt to various audiences and take into consideration the conventions and expectations of many cultures. Even if the firm possesses excess capacity product should make life easier in another culture, the product may not sell unless the company is willing to research the market, a process that needs a lot of intercultural understanding and communication. A company requires research on consumer preferences and attitudes, government regulations, and the purchasing power of consumers. All information must be collected evaluated, organized and then communicated. A company must adapt its strategy to foreign conditions and be aware of consumers needs and satisfaction. Then a decision is made to adapt a product to foreign markets, the requirement for intercultural communication increases. The greater the requirement shall be to communicate directly with people with different cultural backgrounds.

Communication in Teams

Strong communication relations are vital to the wellbeing of a team. The most effective relations occur naturally. Such as:

- Have an appointment areas in which people is able to talk informally and meet.
- Maintain team members in close to ease communication.
- Encourage the most appropriate technology, and keep it up to date.
- Support free flow of communication between colleagues.
- Circulate agendas in advance of the meeting to give our team time to prepare.
- Attempt to delegate to other members of the team.
- Shift chairperson at each meeting to involve everyone.
- To be guarantee that good news is heard and clearly understood by all relevant persons.
- Support all relationships that may be good to the team.
- If issue is in any team relationship, deal with it quickly.
- Grant team roles carefully.
- Keep social contacts with other departments of organization.
- Maintain a record of contacts with valuable persons we meet outside the team.
- Find person with experience when seeking problem-solvers.
- To be interested in good points in an idea, and never criticize ideas in public.
- Guarantee that the whole team is able to learn from solving problems.
- Respect individuals they are doing a good job will build team morale.

How a team communicates internally depends on the location of its members and its size. Team members ought to have easy access to each other. If some members are off-campus supply efficient communication links, for example telephone, fax, e-mail, or video, all locations to

guarantee that dialogue is able to flow freely between the parties concerned. There are various methods for a team to communicate, within its own organization or externally. For example:

- Electronic means, intranet, e-mail, internet
- Consistency in conversational links between colleagues. These create an informal climate in organization.
- Video telephones and video-conferencing facilities that are able to reach right across the international business world.
- Other methods of communication are, for example: circulars, paper memo, reports, letters, faxes, notice boards, and telephone calls.

Making team meetings effective is a critical test of leadership skills. To be sure that team members understand the objective of each meeting and what is expected of them. Meetings often have a clear objective for exchange of information. Meeting are planned for future action. Draw up an agenda to be discussed and circulate this in advance of the meeting. Lead the participation and make purpose clear and aim to accomplish consensus within the team. Support everyone to have their say, subject to relevance and reasonable brevity, more creative the ideas. WORK-OUT MEETING: Meeting of whole team to study work methods. REPORTING MEETING: Meeting to spread special information to team. Teams depend to good networking skills. Make full advantage of the informal and formal connection both outside and inside organization to provide support for team.

If transactional processes make it possible to achieve task processes, then communication effects make it possible for transactional processes to work. Communication is the process of applying nonverbal and verbal to negotiate a mutually acceptable meaning between two or more personnel within a special environment and context. In a group, risk may come from the number

of members and the possible interpretations and interactions that can result from communication. A team normally works in an organization and with other units, dependency influences everything the team does:

- Accepted methods of doing things govern both teams and sub teams. Members live by norm, members know when
- A decision from any part of team can affect other part of that team
- Relationship among sub teams can maintained and created by the communication flow.

Each unit requires the other for information, and all units interact in making decisions, processing ideas, and building relationships. Without effective communication relationships, each unit may function independently, not interdependently.

- Information, influences, and ideas flow into and out of the team both from and to other teams and the environment.

Conclusions

The essentials of communication can lessen when anything changes communication is crucial again. Convergence is achieved only if workers talk about and agree to the ways they should work together to accomplish the objective, who should do what, and who requires what help. Committee convergence is able to be accomplished if people can listen and express to individuals needs and desires. In organizations where workers are not able to talk about their concerns and doubts, disasters occur. If managers and workers do not feel free to say, they don't know something, not able to do it, or feel wrong about conducting it, failure is likely and trust will be broken. If communication is not truthful, projects shall struggle. Organizations work best when there is both trust and individual coverage. Nowadays, multinational companies expand around the world. Communication in global cultural teams is very important. Intercultural

communication is more crucial. Communication in the export-import activities is also essential. Communication in teams is essential in every organization, both domestic and international level.

References

- Anonymous., "Sharing Knowledge Through BP's Virtual Team Network". **Harvard Business Review**. Boston: Sep/Oct 1997. Vol.75 Iss.5 p.152.
- Barley. Stephen R., :Semiotics and the Study of Occupational and Organizational Cultures." **Administrative Science Quarterly**. Ithaca : Sep 1983. Vol.28, Iss. 3 ; p. 393.
- Beamer, Linda., Varner, Iris I., **Intercultural Communication in the Global Workplace**. **Boston** ; Bangkok : McGraw-Hill Irwin, 2008. 4th ed.
- Block, David, Cameron, Deborah, **Globalization and Language Teaching**. London ; New York : Routledge, 2002.
- Bowe, Heather J. (Heather Joan), Martin, Kylie. **Communication Across Cultures : Mutual Understanding in a Global World**. Cambridge University Press, 2007.
- Briance Mascarenhas, Alok Baveja, Mamnoon Jamil., "Dynamics of Core Competencies in Leading Multinational Companies." **California Management Review**. Berkely: Summer 1998. Vol. 40 Iss.4; p.117.
- Clampitt, Phillip G., **Communicating for Managerial Effectiveness**. Thousand Oaks, Calif.: Sage Publications, 2005. 3rd ed.
- Curran, James., Morley, David., **Media and Cultural Theory**. London ; New York : Routledge, 2006.
- Curtin Patricia A. (Patricia Ann), Gaither, Thomas Kenneth. **International Public Relations : Negotiating Culture, Identity, and Power**. Thousand Oaks : SAGE Publications, 2007.
- Eriksen, Thomas Hyllamd., **Globalization : the Key Concepts**. Oxford, UK ; New York, NY : Berg, 2007.
- Glodstein, Susan., **Cross-Cultural Explorations : Activities in Culture and Psychology**. Boston, MA : Pearson/A and B, 2008.
- Hodge, Sheida., **Global Smarts : the Art of Communicating and Deal Making Anywhere in the World**. New York : Wiley, 2000.

- Jandt, Fred Edmund., **Intercultural Communication. An Introduction to Intercultural Communication : Identities in a Global Community.** Thousand Oaks, Calif : Sage Publications, 2004. 4th –ed.
- Katerine Xin., “Management and Cultural Values: The Indigenization of Organizations in Asia.” **Administrative Science Quarterly.** Ithaca : Sep 2001. Vol. 46, Iss.3 ; p.571.
- Mahlon Apper IV., “The Alternative Workplace: Changing Where and How People Work.” **Harvard Business Review.** Boston: May/Jun 1998. Vol.76, Iss.3; p.121.
- Newsom, Doug., **Bridging the Gaps in Global Communication.** Malden. MA, USA : Blackwell Pub., 2007.
- Porter, R.E., & Samovar, L.A., **Communication Between Cultures** (6th ed.), Belmont, CA: Wadsworth, 2007.
- Rudd, Jill E., Lawson, Diana R., **Communicating in Global Business Negotiations: a Geocentric Approach.** Los Angeles : Sage Publications, 2007.
- Taylor, William., “The Logic of Global Business : An Interview with ABB’s Percy Barnevik.” **Harvard Business Review.** Boston: Mar/Apr 1991. Vol.69, Iss. 2 ; p.90.
- Trompenaars, Alfons., Woolliams, Peter., **Business Across Cultures.** Chichester Capstone, 2003.
- Yadong Luo., “Antecedents and Consequences of Personal Attachment in Cross-cultural Cooperative Ventures. “**Administrative Science Quarterly.** Ithaca: Jin 2001. Vol. 46, Iss. 2. ; p. 177.

INNOVATION IN EDUCATION: SO WHAT ELSE IS NEW? REACHING THE INDIVIDUAL STUDENT

Dr. Valerie Maxwell
SOI Systems, Manhattan Beach, California
ADDSOIUSA@gmail.com

Keywords: Innovation, Education, Certified Learning, Standards

Note: This paper was awarded for "Outstanding Presentation" at the International Conference on Organizational Innovation, Bangkok, Thailand, August, 2010

Introduction

While many innovators have tried their hands at changing and improving the educational system, from Somerhill to No Child Left Behind, few have addressed the needs of the individual student. Fundamentally, how do we bring innovative change to a student's learning abilities? We are talking about neither institutional nor curricular change, nor about teacher change. We are talking about proven methods, rarely used, that create neurological transformation in each and every individual student, in their established school setting. The age of brain training has arrived, but schools have yet to board the brain-train.

First, let's examine educational failure. There are three reasons why learning, at any age, may fail: 1. The student is not prepared to learn, 2. The teacher does not deliver the information so the student properly assimilates it, or 3. The information being presented (curriculum) may be inadequate for or insensitive to the learning needs of the student.

If you teach curriculum to the group in a lock-step mode, some learners will be missed...and, invariably, the group will go on. In education, this lacuna has a cumulatively negative effect, often culminating in students dropping out, and at the very least in feelings of pervasive-personal failure. Whole portions of the student's educational future are then missed. This can create academic avoidance, for example, with females who might have trouble with math, hence forgoing many career opportunities. Doors of opportunity begin to close for students with learning differences.

In an educational meritocracy, historically, you could succeed by having a narrow but well-grounded education; yet now, more and more, the business world demands a workforce population with more than a basic understanding of many fields of learning. More than ever, the world today fervently needs disciplined, motivated and hard-working critical thinkers who are willing to go the distance in their endeavors. The earth and its inhabitants need an abundance of best minds to solve unprecedented crises like the oil spill in the Gulf of Mexico. It appears that we are producing fewer and fewer of this kind of educated adult, while we experiencing even more educational failures.

Almost All Failures In Education Are Correctable...If They Are Detected And Treated Early.

“The earlier that a failure is identified, the easier it is to correct.” (Robert Meeker, Ph.D. SOI Founder, 2009 Internal Document, SOI). Nevertheless, neuroscience once again confirms that the key to educational success is, indeed, in early education. According to Robert Meeker, it is well known that “it is easier to build a child, than to mend an adult.” Yet, recent data on the well-liked early education/intervention, popularized in the 1970's, indicates that too often Head Start programs have emerged as not much more than childcare. Why have they failed?

Almost all failures in learning result from the well-worn educational observation: The student did not come to school prepared to learn. This is a problem, but it is not a rationale for failure. When students are not prepared to learn, it means that the learning presentation has made assumptions about the students' skills, abilities, and concept-repertoires which the students do not meet. If a consumer complains about a car that is a lemon and the car company blames the failure on "bad material," they are simply identifying a problem, but this is not a rationale for failure-- a responsible car company will change suppliers. Toyota's recent crisis is a case in point. Eventually, companies take responsibility and correct the problems. When persistent learning failure sets in, problems are compounded. An endless cycle of self-defeating emotions and behaviors ensues. We believe that this kind of behavior typical in the current global culture reflects the profound sense of powerlessness that plagues so many people. Powerlessness often begins in one's first years of school experience. The kind of innovation we will outline can help solve the global educational problem.

Certified Learning*: The Innovative Alternative

Certified Learning is not a zero-sum game. It democratically produces learners who both succeed and take responsibility for their learning; it is the opposite of a meritocratic educational system. Children of all races, learning profiles, and social economic status are successful in the curriculum and graduate Certified Learning kindergarten and first grade with historically high levels of self esteem, personal responsibility, disciplined behavior and interpersonal empathy. They have developed their brains and very few are "left behind." We call this "Mastery." Certified Learning is the product of over 50 years of research provided by the Structure of Intellect (SOI) theory of identifying and training learning abilities. It is nothing less than the educational Holy Grail widely sought but elusive...until now.

SOI is a series of learning programs that range from readiness in kindergarten, to training and career counseling in industry, to rehabilitation in correction facilities. Clients include beginning learners, the learning disabled, autistic, ADHD, and the academically gifted. SOI can offer this broad range of testing, teaching, and training services because it is based on a proven theory of human intelligence

Dr. J.P. Guilford developed the theory underlying SOI in military and academic research. During World War II, the US Air Force was using IQ, vision assessment and good health as the basis for choosing pilots. With these conventional criteria, 35% of the individuals selected "washed out" during the training. Guilford was asked to develop a more effective screening tool. He did so and when his new screening was applied the "washout" rate dropped to 9% for bombardiers, and 5% for pilots and navigators. The full theory is explicated in his 1967 book, The Nature of Human Intelligence.

Mary Meeker, a doctoral student of Guilford 's, along with her husband Robert, took Guilford 's theory and developed it into an effective tool to assess learning capacities and to develop learning abilities where needed. It is this ability to develop potential learning abilities that makes SOI stand out from the many other intelligence tests. Mary Meeker's original work with SOI, The Structure of Intellect; Its Interpretation and Uses, expands our understanding of the breadth and depth of human intelligence.

The SOI Model for Learning focuses on the learner. It identifies those abilities, skills, and competencies that are expected of the student in most learning situations. It then provides the means of assessment to determine whether a given student meets these expectations. If the assessments reveal weaknesses, the program provides the means for overcoming these impediments by developing the abilities, skills, or competencies that are expected.

SOI Certified Learning -- Total Quality Management and Education

The application of Total Quality Management (TQM) to public school education has many advantages. First, TQM, while an older but still compelling business theory by Deming (Deming's 1950 Lecture to Japanese Management), does not tolerate continuing errors, so no instructional failure will go undetected or will be accepted -- all students are expected to master every step leading to mastery of the educational standards for their grade levels. Success is guaranteed for every student, so in a literal sense, rather than in a political sense, no child will be left behind.

Second, TQM is a complete system. Wherever and whenever failures occur, the system has procedures for correcting them. In this way the system is self-correcting and is constantly improving. The system improves week-to-week, so everyone -- students, teachers, and administrators -- benefit immediately from the improvements.

Third, the system offers new standards of evaluation at all levels. The evaluations are directly relevant to the instructional process. The emphasis in evaluation is not on testing; it is on measured success. The result of not passing a test is not a label of failure, but a prompt to find a way to master the material being tested.

Total Quality Management has been used in industry for more than 20 years. It is responsible for the quality and reliability of Japanese cars and electronics. It has been adopted, at one time, by every major manufacturer in the world. But students are not widgets, so how can we apply a system made for manufacturing, to education?

We can adopt the principles of TQM and adapt the procedures to the special circumstances of education. The circumstances of education are very different from industry, so we need to modify the usual procedures to create an educational model of Total Quality

Management.

What are the principles of TQM? First, the management system insures continuous improvement. Continuous improvement is not measured exclusively in terms of outcomes. Outcomes are obviously important, but when the focus is exclusively on outcomes, the enterprise often loses sight of its mission -- industries concentrate on the bottom line and lose sight of their customers in the process; schools concentrate on high- stakes test scores and lose sight of their students' needs. For TQM, continuous improvement is a systematic process of detecting your defects and having procedures in place to find their causes and correct them. In education, the "defects" are instructional failures specifically defined -- i.e. a student fails to master a step in the curriculum sequence.

So, continuous improvement requires a system for detecting failures when they occur and procedures for correcting those failures when they occur. Detection and correction go hand-in-hand. The failure that is easiest to correct is the one that is best defined and most immediate. Failures persist either because they are not detected or are not corrected. And failures that persist become more difficult to correct because they carry negative consequences for future learning. Learning is a cumulative process, and failures interrupt and/or negatively affect the on-going process. The system is best served when failures are corrected immediately.

For education this means specifying a curriculum in discrete steps of manageable size -- units that can be mastered in one to four weeks. Each unit teaches a specific objective that can be easily tested in a matter of a few minutes. The testing has two outcomes -- mastery (all responses correct) or no-mastery. And the outcomes have correlated consequences. Mastery sends the student to the next unit in the series. Failure to master sends the student back for more practice. And a second failure raises a red flag in the system to obtain special help for this student on this

unit -- not special help in general, which is, by definition, unfocused and difficult to evaluate. On the other hand, special help for a specific unit is easy to evaluate; it either results in correcting the failure or it is a signal to seek system-level help.

Industry and education differ critically in their approaches to detected failure. In industry, if the cause of failure is traced back to defective material, the industry looks for a new, reliable supplier, because that is much more cost effective than dealing with defective material. Obviously, looking for new suppliers is not an option for public education. So, the system must be prepared to identify the skills, abilities, or concepts that the learning presentation assumed the student would have and which the student did not have. These can be perceptual skills, sensory-motor skills, intellectual abilities, or lack of enabling concepts. Whatever the deficit, the system must be prepared to identify them and find a remedy if at all practically possible.

SOI Certified Learning is committed to all of these principles and procedures. We have a management system to schedule all students and track their progress. We have specified a ninety-six step curriculum for Kindergarten with expectations as to the weeks (1 to 4) needed for mastery. We have mastery tests and/or criteria for all of the steps in the curriculum. We have built-in procedures in the management system for attention to failure, including the revision of curriculum if the failures are widespread for a given unit in the sequences. We issue reports bi-weekly so personnel at all levels -- classroom, administration, and system -- can respond to problems that are documented.

We have installed SOI Certified Learning in over 40 kindergarten-through-first grade classes in the various communities in Texas. We are in our third year of implementation in five kindergarten classes, and second year in five grade one classes in the White Settlement ISD in White Settlement, Texas (a suburb of Fort Worth). We have had constant feedback from the

classroom teachers and administrators. We have made some in-course corrections and some recommendations for going forward into the next year. We have recently concluded an agreement to implement SOI Certified Learning in six kindergarten classes in the Sweetwater ISD in Sweetwater Texas.

A New Standard for Evaluating K-12 Education

Given the experience with No Child Left Behind (NCLB), it should now be obvious that the current standards for evaluating K-12 education are not working. The politicians may boast that test scores have risen, but everyone close to the situation – teachers, students, administrators, and parents – know that education is not significantly better than it was ten years ago. NCLB has taught us one thing: If the principal measure of success is the performance of the group, then there will be children left behind.

The primary focus is now clearly on the group, not on the individual. While most teachers are philosophically committed to the individual, there is the practical reality of needing to “move on” even if some in the group are being left behind.

The result of the group focus is that some students will be left behind because they do not count as much as the group. In some highly publicized cases, students have been systematically excluded from the group statistics in order to improve the overall performance of the school. Imagine the message to these students: Worse than being left behind, they are being treated as non-entities.

The current standard of evaluation is lamentable, but it is nothing more than the traditional standard carried to an extreme. Since the middle of the last century we have tended to judge school performance by group statistics, but the inherent flaws in the system were only made obvious when the informal standard became codified at a national level.

We cannot go back to the way things were before NCLB. That policy arose out of a widely perceived need for accountability. That perceived need still persists, so any alternative to the group-teach- statistics of NCLB must be a credible standard that will satisfy the demands of accountability. Can we find new standards that will put education back on track and, at the same time, satisfy the demands of accountability? Yes, and the key is to change the focus from the district-school-classroom group to each individual student.

Equal opportunity in society has been a bedrock concept of the national policy since the nation's inception. When, with the emerging recognition of individual differences, it became obvious that group-teach did not provide equal opportunity for all, schools began to pay more and more attention to the individual.

The emphasis on individual differences is a trend that has continued and grown. It is what sets US education apart from most other systems in the world, which makes our educational system one of the most advanced in the world.

Historically, as the US education system embraced the importance of individual differences, it did not bring about fundamental change. The system remained, basically, group-teach, but with an individual-difference overlay. One need only look at the codified procedures in the system to see that this is true: The hallmark of individual differences is Special Education. And, by policy, a student must be two years behind in achievement (group-teach achievement) in order to qualify for Special Education. (There is also some question as to whether Special Education is truly individualized or simply an alternate form of group-teach; but, even if this is so, it is still a laudable effort to deal with individual differences.) Some districts in the US have as much as 40% of the student population in (no so) "Special Ed." So, even with a growing emphasis on individual differences, the fundamentals of the system have not changed.

So we should take a lesson from history in creating a new standard for evaluating K-12 education. We, as educators, are in the same position as the Japanese manufacturers were in the 1950s – we can adopt a new way of measuring success and thereby leapfrog the rest of the world in education. We already have an advantage, namely, we understand individual differences better than other nations; so, we have the know-how to build the procedures to meet the needs of all students in their individuality.

Of course we recognize that educating students is not manufacturing products – it is, in fact, much more complicated – but having a quality-driven enterprise transcends the differences between education and manufacturing. Let's look at the advantages in having schools as quality-driven enterprises with Quality Performance Reviews. The principal goal is this: Every unit within the school will have a system of integrated procedures that will enable, within practical limits, every student to progress to the maximum of his or her individual abilities. Let's look at the advantages of such a system, and then discuss how it might actually be achieved. Let's see how the consumers of education – students, parents, taxpayers, and employers – might view such a system.

Students: Students will soon realize, even at the kindergarten level, that their education is a matter of individual achievement, not a group competition. Since the system is committed to addressing individual differences that may manifest themselves in instructional failure, that failure is more readily accepted by the student when it is obvious that the system is going to do something to remedy the failure as quickly as possible.

Parents: To the extent that parents have a choice (by home buying or open enrollment) of schools, they would be able to look at the Quality Performance Reviews to determine the best school for their children. So, whether it is quality in general or in addressing special needs, the

Quality Reports are superior to group-statistics – the Quality Reports will tell how their children will be treated; they have no idea where their children will end up in the group-statistics.

Taxpayers: Taxpayers may resent all taxes, but they revolt against taxes where they are not receiving quality services for their money. Most taxpayers have little idea as to whether they are getting quality for their dollar because the typical classroom-school-district-state reports are so obfuscated with exceptions and jargon that they are of little use.

Employers: Employers would be in the same position with respect to school graduates as they are with respect to anything else – namely does the Quality Review Report for the school indicate that this is a good source for hiring.

Now let's see how the producers of education – teachers, administrators, and educational governance – might view such a system.

Teachers: Teachers would have an entirely new basis of performance review, namely, are they following the procedures to produce the best results, and do they contribute to the general modification of procedures if they see how they could be improved. Notice, in particular, that on this basis of performance review, a teacher can do as well with a group that is preponderantly limited as with a group that is preponderantly gifted – the standard for both groups, and individuals within those groups, is the same.

Administrators: Classroom progress and teacher reviews are now documented at the individual student level in terms of success and remedies for failure. Performance reviews are more meaningful, more effective, and more fair when they are based on specifics rather than general outcomes.

Educational Governance: The role of governance is to set educational goals that are in line with broader policy goals for the region or nation as a whole; to provide oversight based on Quality

Performance Reviews; and to insure that the established procedures are being followed. This can be at the district, state, or national level.

Summary and Conclusion

In summary, the proposed standard would be more in line with the philosophy, stated goals, and commitments of those directly involved in education. What are the barriers to such a standard? They are formidable. The resistance to change will be as large for education today as it was for the auto industry in the 1950s. And the auto industry in the 1950s had an impetus to change that the educational establishment does not have, namely, the auto industry was facing a financial future downturn; the mantra of the day was “change or perish.” Education does not have that impetus; education is in no danger of perishing financially, so its only impetus to change is to be driven by an internally generated desire to do better. That may be too abstract to gain any traction.

What Changes Would Be Necessary To Implement The Procedures That Would Support Quality Performance Standards?

- Small curriculum units. The curriculum would need to be recast into units of modest length – the majority requiring only a week, and none requiring more than one month. Small units are required so failures can be easily identified and quickly remedied. The units need to be standardized throughout the system at the district level.
- Individual records of progress. Every student needs to be tracked through every unit in the curriculum. This is required so individual needs can be identified and adequately addressed.
- Remedial procedures. Every failure in the system needs attention. Many of these failures will have enough frequency that general procedures for remediation can be prepared in advance and ready for application. For those failures that are outside the current set of remedial processes, the system needs to have consulting help available for any situation that the teacher cannot

handle. This consulting will result in new procedures that can be added to the system's repertoire.

□ Reporting system. Reports of the system performance need to be generated on a monthly basis so they can be reviewed by the consultants and by the administration.

Quality Performance Reviews: These need to be generated each half-year at a minimum; they will provide the basis for oversight of the process at every level and will provide an objective source of review for the system performance that will affect decisions about curricular goals and curricular content.

We can make this innovation in education globally! None of this is technically beyond our capabilities at present but it may, as a whole, be beyond our will to change. The greatest inducement to change is the prospect of more NCLB or whatever system of group- teach accountability takes its place. The Principles, administrators and educators in Texas who have already successfully innovated their schools have made these remarkable changes! The results are impressive and accountable! If Texas can innovate to this degree, then the sky really is the limit!

References

ADDSOI.com - Attention Deficit Disorders and Structure of Intellect Information and Services.
<<http://www.addsoi.com>>

Deming, W. Edwards (2000). *The New Economics for Industry, Government, Education* (2nd ed.). MIT Press. ISBN 0-262-54116-5. OCLC 44162616.

Deming's 1950 Lecture to Japanese Management. Translation by Teruhide Haga. Accessed: 2006-06-16.

Guilford, J.P. (1967) "The nature of human intelligence", McGraw-Hill, New York

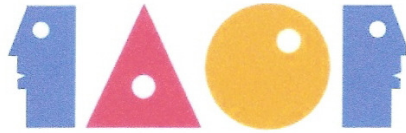
Meeker, Mary Nacol. *The Structure of Intellect; Its Interpretation and Uses*. Columbus, Ohio: Merrill, 1969.

Meeker, Robert (2009). "Certified Learning: A Manual," internal document. SOI Systems P.O. Box D 45755 Good Pasture Road Vida, OR 97488 541-896-3936

Peterson, Paul E., and Martin R. West. No Child Left Behind?: the Politics and Practice of School Accountability. Washington, D.C.: Brookings Institution, 2003

Rafferty, Max Lewis. Somerhill: For and Against. New York: Hart, 1970

SOI Systems. Web. 30 June 2010. <<http://www.soisystems.com>>



MANAGING INNOVATION: A TYPOLOGY OF THEORIES AND PRACTICE-BASED IMPLICATIONS FOR NEW ZEALAND FIRMS

Anton de Waal
Christchurch Polytechnic Institute of Technology, New Zealand
dewaala@cpit.ac.nz

Alex Maritz
Swinburne University, Melbourne, Australia
amaritz@swin.edu.au

Chieh Jen Shieh
Chang Jung Christian University, Taiwan
charles@mail.cjcu.edu.tw

Abstract

Whilst research in generic innovation is abundant, the literature on the management of innovation in firms is scant. This study proposes a conceptual generic framework facilitating the management of innovative initiatives in firms. Its scope of application is much broader than that of contemporary theory in the sense that it addresses not only aspects of the innovation process, but also strategy, metrics, supportive organization, leadership, external linkages, and innovation tools. Secondly, through exploratory research, the paper sheds light on how well New Zealand managers/CEOs are managing innovation within their firms. The results indicate that while there are many encouraging signs, there is also ample scope for improvement. New Zealand firms lack strong leadership in creating 'innovation friendly' cultures and mostly fail to define appropriate innovation metrics and assess their organizational innovation performances.

Keywords: Innovation Management, Innovation Capability Assessment, Innovation Process, Innovation Tools, Framework, Economic Growth.

Introduction

Innovation has been hailed as the primary source of wealth creation, and absolutely essential for corporate survival (Dillon, Lee and Matheson, 2005). Given its importance, essential questions that ought to be asked by governments and business leaders alike are: How innovative is the country at national and corporate levels compared to other countries? To what extent is the combined national innovation effort contributing towards increased wealth and prosperity for all stakeholders? What can be done at firm level to increase the quantity of innovation output while simultaneously improving the quality of innovation output? Only when satisfactory answers can be found to these questions, can countries and organizations begin to take significant strides towards improving its innovation performance at various levels.

In this paper we follow a three-thronged approach to answering the above questions. The first section is a reporting study that gives a synopsis of the general state of innovation in New Zealand. Secondly, we derive a conceptual framework for managing innovation at the firm level. This framework is suitable for firms of any size and operating anywhere in the world. In the last instance, we carry out an exploratory study among New Zealand firms to gauge how well managers are managing innovation within their organizations, with the emphasis on measuring innovation performance.

The State of Innovation in New Zealand

Macro and Micro Level Innovation Indicators

At both macro and micro innovation levels it seems that New Zealand's ranking is at the lower end of the OECD, according to the recent results of The Global Competitiveness Report 2005-2006 (Porter and Schwab, 2005). The country came 22nd out of 117 countries in terms of the Global Competitive Index's (GCI) Innovation Factors. The GCI Innovation Factors sub-

index has two sub-indices, the Business Sophistication Sub-Index, and the Innovation Sub-Index. The former index is determined by factors such as the efficiency in the production of goods and services, the quality of a country's overall business networks, and the quality of individual firms' operations and strategies. New Zealand achieved a score of 5.24 for this index, putting it in 22nd place. The Innovation Sub-Index is determined by factors such as the national innovative potential and capability, and an appropriate and conducive environment (which in turn is characterised by joint and coherent efforts by both public and private sectors; the quality of scientific research institutions; skills levels of the workforce; sufficient R&D spending by private companies; sufficient IP protection; and active collaboration between universities and R&D companies.) For this indicator New Zealand came in overall 23rd place with a score of 4.25.

Innovation Outcomes

In addressing the question on derived benefits from innovation, the Ministry of Research, Science and Development's Innovation in New Zealand (Statistics New Zealand, 2003) survey focused on the achieved outcomes of innovation activity. It found that 80 percent of businesses that implemented innovations in the last three years reported an increased range of goods and services as a result. 79 percent furthermore reported increased profitability, 75 percent improved efficiency, and 64 percent entered new or expanded markets in New Zealand as a result of innovation activity. On the down side the survey found that innovation activity contributed little to opening up new overseas markets (30 percent), reduced environmental impact (21 percent), or reduced energy consumption (18 percent).

Innovation and improvements in technology are generally recognized as the major underlying drivers of long-run economic growth (Ministry of Economic Development, 2005). Whilst little is known about the exact relationship between innovation and economic growth,

including how it works, evidence is emerging from research within the European Union that regional innovative activities play a significant role in determining differential regional growth patterns (Crescenzi, 2005). Even though differences in economic growth in different countries cannot simply be explained by differences in innovative activities or innovation measures alone, a comparison of GDP figures among different countries is still insightful. Towards the end of the 1990s New Zealand's per capita GDP had been declining relative to its OECD counterparts (Organization for Economic Co-operation and Development (OECD), 2005). This trend has since been reversed and in recent times New Zealand has enjoyed almost consistent economic growth. Since 2000, New Zealand's 3.9 percent average growth per annum has been above Australia's 3.3 percent, the United Kingdom's 2.8 percent and the United States' 2.9 percent, and significantly higher than the OECD average (2.5 percent). In real terms, the picture is less attractive. In 2004 New Zealand came in 24th place in GDP per capita, way behind Australia in 13th place and Ireland in 4th place. In absolute terms New Zealand's GDP per capita is only about 81 percent that of Australia, despite New Zealand's Global Competitiveness Index on Innovation Factors being on par with Australia's at 4.75. Disregarding other factors for a moment, the indication is that New Zealand's innovations do not translate into the same degree of wealth generation as it does in Australia.

Achieving Innovation Excellence

If New Zealand firms struggle in getting the most out of their innovation efforts, they need not feel alone. Worldwide firms still struggle in getting it right, as is evident from a 2005 global survey of more than 900 top executives by The Boston Consulting Group (Venables, 2005). It found that even though companies continue to pour more money into innovation, a majority of their senior executives were not happy with the returns on this investment. Cooper

and Kleinschmidt (1993) contributed this to a clear gap that often exists between managers' perceptions and the reality of appropriate criteria for successful innovation.

What then, are the organizational conditions for successful innovation? The Ministry of Economic Development (New Zealand) (2003) report found that 56 percent of all businesses surveyed rated a lack of management resources as the biggest impediment to innovation. Other factors rated by a majority of businesses as hampering innovation were the costs to develop new products, processes or services (53 percent), and lack of appropriate personnel (51 percent). Other impediments to innovation that were adapted from the European model for use within New Zealand survey, but with ratings significantly lower than those mentioned before, were a lack of information about finance, lack of marketing expertise, lack of cooperation with other businesses, and the inability in obtaining intellectual property. Logic dictates that the opposites of these impediments would make for a sensible set of conditions that support innovation. These include a sufficient supply of management resources, funding, staffing, marketing expertise (especially in overseas markets), collaboration with other businesses, and the creation of and access to intellectual property - listed here in descending order of importance for New Zealand firms.

From the above reports it appears that New Zealand as a country is playing innovation catch-up with most of the OECD countries. While the country's firms are introducing new products and processes at similar rates to firms in European Union (EU) countries, there is little benchmark information on the quality or value of these innovations or the impact they are having on firm-level productivity. Ultimately market forces determine whether, and to what degree, innovations are absorbed into world economies. Market force 'decisions' are inevitably based on the quality, not the quantity, of such innovations. In this paper we argue that while it is important

for the advocates of innovation to focus on the desired outcomes of innovation, they should pay at least equal attention to the factors that determine the quality of innovations. Such factors include (Ministry of Economic Development, 2005):

1. effective and competitive markets;
2. a dynamic research and development system;
3. high quality skills and basic information for innovation and entrepreneurship;
4. well designed, targeted and evaluated business assistance programs;
5. capital markets that can effectively recognize a country's innovation opportunities;
6. effective business links, both nationally and internationally; and
7. the performance of the innovation system.

While much progress has been made in New Zealand to optimize factors one to six, not enough is being done to increase the performance of the country's innovation system (factor seven), in particular at firm level. Firms are often quick in making statements about their perceived state and level of innovation, and also claiming that their managers are good at managing innovation, but are they able to quantify it or back it up with factual data?

To date little research has been carried out in New Zealand to shed light on how well managers are managing innovation within their firms. Many business owners, CEOs and business managers continue to struggle with the key question of how innovative their organizations are, and what they can do to improve their innovation performance. Possible reasons for this include failure to measure (Muller, Välikangas and Merlyn, 2005), choice of limited metrics and tools (Rae, 2006), a perceived lack of appropriate metrics or simply not having a true understanding of what innovation really means (Muller, Välikangas and Merlyn, 2005).

The performance of innovation systems in part depends on how well these systems are being managed. Despite plenty of scholarly activity in this field of study, much confusion remains to this day as to what exactly constitutes managing innovation. Scholars often confuse this important function by limiting its scope to those activities related to managing the various stages in the innovation process, e.g. idea generation. A comprehensive, generic framework is still lacking. In response we propose a much broader view of innovation management that includes not only aspects of the innovation process, but also strategy, metrics, supportive organization, leadership, external linkages, and innovation tools. We deliberate on this in the next section.

Innovation Management

Innovation means different things to different people. As there is no single authoritative definition for innovation and its underlying concepts, including the management of innovation, any discussion on the topic becomes difficult and even meaningless unless the parties to the discussion agree on some common terminology. In this paper we use two definitions, each contributing valuable insights. The first is the Ministry of Economic Development's definition (2005) (New Zealand): "Innovation is the dynamic process through which firms create new economic value by creating, adopting and adapting knowledge into new or improved products and services, processes and organizational arrangements." The second is by Tidd et al. (2005, p. 40): "Innovation is a core process concerned with renewing what the organization offers and the ways in which it generates and delivers these".

A particularly significant point to note from these definitions is the fact that innovation is a process, which implies that it can be managed. This is encouraging, as it means managers can proactively plan, organize, control and lead all aspects of innovation and thereby presumably

positively impact the desired outcomes. Managers should not forget, however, that innovation is complex, uncertain and almost impossible to manage (Tidd, Bessant and Pavitt, 2005, p. 571).

These authors claim that in conditions of complexity and change, which are reminiscent of managing innovation, there are no easily applicable recipes for successful management practice.

Another significant aspect that flows from the second definition of innovation is that different organizations justifiably do it differently (“... and the ways in which it generates and delivers these”). In support of this view is the observation that innovation is a context-dependent phenomenon (Wolfe, 1994) which means it is influenced by environmental, organizational and individual level variables. Furthermore, because of differences in technological, market and organization-specific characteristics among industries and firms, there is unlikely to be ‘one best way’ or universal formula for successful innovation (Tidd and Bodley, 2002, p. 128). Koen et al (2002) explain why they prefer using the term ‘effective innovation practices’ as opposed to ‘best innovation practices’. Similar to Tidd and Bodley they believe the latter term implies that there is a best practice that should be followed. In reality, however, certain practices may be ‘best’ only in particular company settings. The use of the term ‘effective’ indicates that certain practices have been found to be successful for particular companies. Against this background Tidd and Bodley (2002) suggest a contingency approach to managing innovation. Central to contingency theory is the concept that no single organizational structure is effective in all circumstances, and that instead there is an optimal organizational structure that best fits a given contingency, strategy, task uncertainty or technology (Donaldson, 1996). Other experts such Peters and Waterman (1982), Cooper and Kleinschmidt (1987), and Gupta and Wileman (1990) prefer using the term ‘better practice’.

While acknowledging the difficulties expressed by the various scholars above, we do not

fully succumb to the view that it is too difficult or even impossible to find a framework that satisfies everybody under all possible circumstances. By its nature innovation is uncertain, complex, and constantly changing, but the management thereof is far less ambiguous and uncertain. The same fundamental management principles that govern other aspects of business should equally apply to managing innovation, and hence can be conceptualized in a generic framework which we developed from a review of the extant literature.

A Conceptual Framework for Managing Innovation

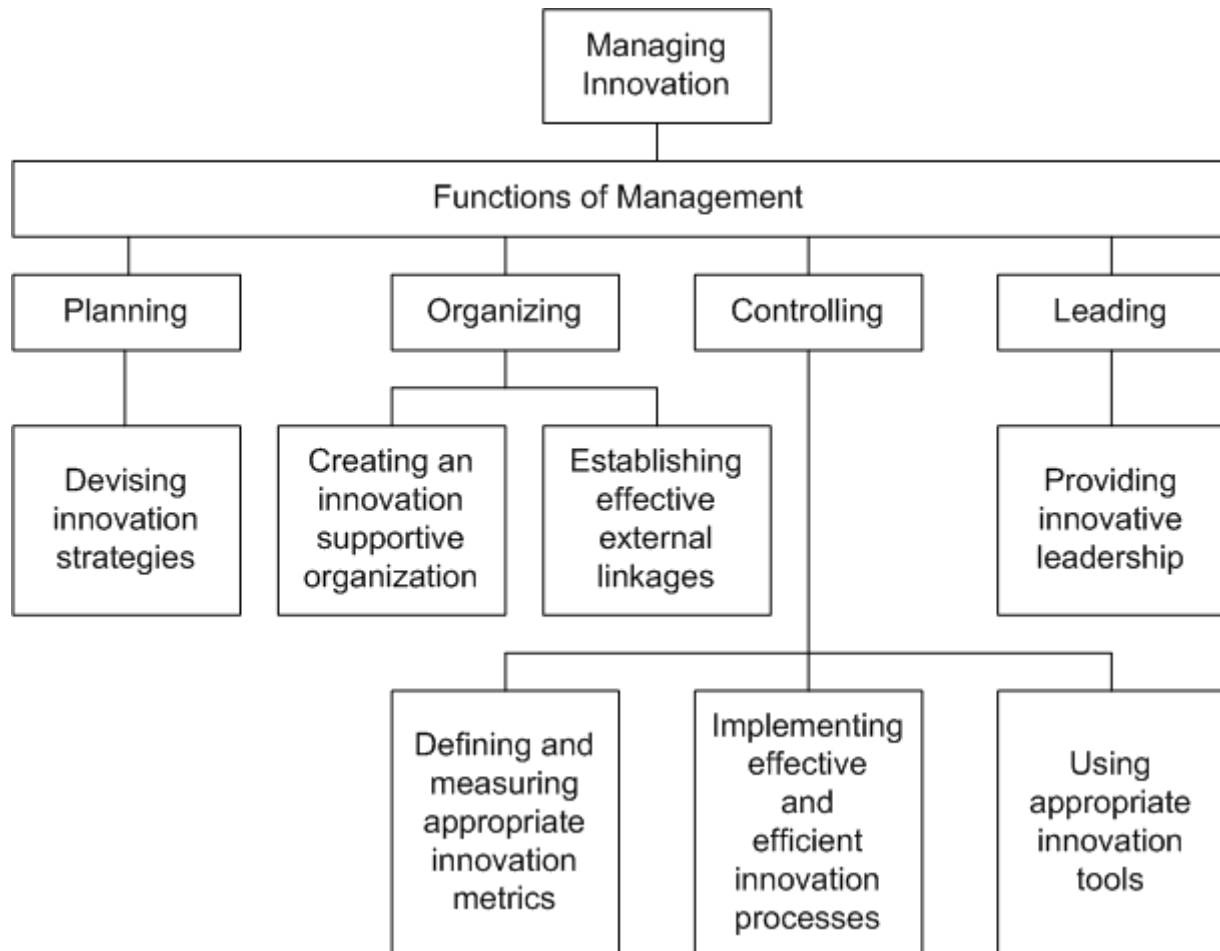
From a review of the literature seven key elements emerged that managers ought to address for managing innovation effectively. Integrating this view of innovation management with Fayol's (1949) four functions of management, it is possible to devise a generic framework as depicted in Figure 1. In no particular order, the seven elements are (1) the formulation of an innovation strategy, (2) having an innovation supportive organization, (3) collaborating with innovation partners (external linkages), (4) the identification of appropriate innovation metrics and its subsequent and continued measurement, (5) developing and implementing suitable innovation processes, (6) making use of appropriate innovation tools, and (7) providing innovative leadership. This is a socio-technical systems approach (Cormican and O'Sullivan, 2004) to developing an effective framework for managing innovation that includes people and process, as well as technology related issues. It is not claimed that the elements of this framework, as briefly described below, are the only ones that matter. We merely propose that sufficient evidence exists to confirm their importance in the context of managing innovation and achieving high quality innovation outputs.

Innovation Strategy

Innovation strategy dictates, amongst other things, the most appropriate innovation

processes for the firm’s context and targets — whether these processes are relatively simple or complex (Dodgson, Gann and Salter, 2008). Mercer’s

Figure 1. Innovation Management Framework



(Mercer Management Consulting Inc, 1994) comparison of high and low new product development (NPD) performing firms found that strategy for the NPD program as a whole was an important differentiator (68% in higher performers and 43% in lower performers). In simple terms, innovation strategies help firms choose the right innovation projects. Other interrelated elements involved in innovation strategy include specifying how projects must ‘fit’ with overall

company strategy, the allocation of available resources, goal setting, and the identification of required innovative capabilities for successfully carrying out innovation projects.

Supportive Organization

“There is no innovation without a supportive organization” (Ideaction, 2007).

Innovation scholars have unveiled numerous factors that, to a greater or lesser degree, have the potential to make organizations more conducive to innovation:

- A culture that encourages creative thinking, innovation, and risk-taking (Sheppard and Canning, 2006).
- A culture that supports and guides intrapreneurial liberty (Jamrog, Vickers and Bear, 2006) and growing a supportive and interconnected innovation community (Pinchot and Pinchot, 1996).
- Cross-functional teams that foster close collaboration among engineering, marketing, manufacturing and supply-chain functions (Eppinger and Chitkara, 2006; Gebert, Boerner and Kearney, 2006).
- An organization structure that breaks down barriers to innovation (flat structure, less bureaucracy, fast decision-making, etc.) (Buhler, 2002; Chanal, 2004).
- Managers at all levels that support innovation (Buhler, 2002).
- A reward system that reinforces innovative and entrepreneurial behavior (Saleh and Wang, 1993).

Managers who are keen to create innovative organizations are encouraged to emulate and manage these factors in their organizations. This list by no means claims to be exhaustive.

Innovation Routines/Processes

In specifically dealing with the management of innovation, Tidd et al (2002) introduced the concept of organizational routines. They theorized that all organizations develop

particular ways of behaving, or firm-specific routines, which become ‘the way we do things around here’ as a result of repetition and reinforcement. Ultimately these routines are either strengths, that help move the organization in the right direction, or barriers that prevent progress. They make a strong case that successful innovation management is primarily about searching for, building and improving effective integrated routines or processes.

Innovation Tools

Innovation routines generally involve the use of a variety of innovation tools, which Tidd et al (2002, p. 358) defined as “structured aids to help analyze (diagnose) and act in managing the innovation process”. On their website Innovation Management Toolbox (Tidd, Bessant and Pavitt, 2007) they provide an introduction to innovation tools and a brief overview of some popular ones. At the simplest level, these authors see innovation tools as something that helps get a job done, but they stress that it is not a substitute for the person doing the job. Tools can be fairly simple (back of the envelope stuff), to very complex applications such as computer based aids to analysis. All tools have one thing in common, though, the fact that it can be used to help get something done in an effective and efficient manner.

Innovative Leadership and External Linkages

Innovative leaders provide a strong and significant influence on organizational learning which indirectly affects firm innovation (Aragón-Correa, García-Morales and Cordón-Pozo, 2007). They furthermore stimulate employees’ idea generation and application behavior (de Jong and Den Hartog, 2007) and establish effective external linkages with technology suppliers, markets and other organizational players (Tidd, Bessant and Pavitt, 2005).

Innovation Metrics and Innovation Capability Assessments

Guest (2005) argues that, in addition to having innovation processes with supporting innovation tools in place, the effective management of innovation also requires organizations to pay attention to innovation performance metrics. In contemporary innovation literature the practice of assessing the state of innovation within organizations is commonly referred to in two ways, interchangeably. The first is ‘innovation audit’ and the second is ‘innovation capability assessment’. In this paper we refer to these concepts interchangeably.

Other leading thinkers on innovation also agree on the importance of measuring innovation, and suggest it is a good place to start for any organization committed to innovation. Innovation metrics has two main purposes (Muller, Välikangas and Merlyn, 2005). First, it helps managers make informed decisions on objective data, and second, it affects behaviour by helping align goals and actions with the best interests of the company. Peter Drucker (Amidon, 1998) claimed that innovation, and the ability to measure the performance thereof, are essential competencies for the future. Mark Fuller, chairman and CEO of the Monitor Group, was quoted as saying “competitive advantage roots best in soil nourished by disciplined, sustained innovation...” (Prospero, Conley and Underwood, 2005, p. 65). He furthermore stated that innovation is impossible to sustain without rigorous, and relentless, efforts to measure and improve performance along all relevant dimensions. Deming (1986) expressed a similar view when saying “if you don’t measure it you can’t manage it”.

Measuring innovation is not a once-off process; it should be monitored on a regular basis (Prospero, Conley and Underwood, 2005, p. 65). The term ‘audit’ means assessing, checking, evaluating, and improving performance (Tate, 2003). Tate suggested the process should be designed to help organizations think, compare, illuminate, learn, plan and improve. In this

context they defined innovation as a process involving the generation and implementation of new ideas, practices or artifacts within an organization (Markham, 2002).

There are almost as many approaches to measuring innovation as there are innovation audit tools. These audit tools can be broadly categorized in three categories. The Internet-based audits (Innovation Network, 2007; National Centre of Excellence in Functional Foods, 2006; The Idea Centre, 2007; Thunderbolt Thinking, 2007) are often of the self-assessment, free-to-use types that provide real-time processing of submitted data. Users typically answer a few (up to twenty) online questions whereupon they are instantly provided with output, which merely consists of one to six high-level innovation indices that really only serve the purpose of stimulating interest in the rest of the paid-for services on offer on these sites. Then there are the more advanced, free-to-use innovation audits such as the Innovation Climate Questionnaire (Anonymous, 2005) and that of Te Kaihau The Windeaters (2007). These audits typically require more input and provide more detailed reports, but often fall short because of its apparent lack of incorporating a sound theoretical basis in its design. As a result the metrics offered by these tools offer a limited view of a company's innovativeness. Finally there are the commercial or proprietary innovation audits that are generally quite thorough in its assessment, and founded on sound theoretical principles. Examples in this category include Fast Company's Innovation Scorecard (Prospero, Conley and Underwood, 2005), William Tate's Business Innovation Audit (Tate, 2003) and the Value IQ instrument (Matheson and Matheson, 1998). In the true spirit of New Zealand innovation, the country recently devised its own tool for measuring innovation performance, called the Innovation Monitor™ Survey (IdeasAccelerator, 2007).

Despite the large number and variety of audit tools, Rae (2006) observes that "it is very curious to note that at a time when the business world uses such sophisticated tools to measure

just about everything, this same type of universal yardstick has yet to emerge for innovation”.

We argue that, in the absence of such a universal yardstick, it is still better to make an attempt at measuring innovation than not to measure anything at all.

Measuring Innovation Performance

With a suitable innovation management framework in place, we continue to explore the management of innovation with specific focus on innovation capability assessments, which involve the definition of innovation metrics and the ongoing measurement of a firm’s innovation performance. It is a good starting point, as it assesses the firm’s current situation in the remaining six elements of the framework and allows for goal and future direction setting.

Research Methodology

For the exploratory research we completed a nationwide survey. The first part of the survey collected general data on innovation management, while the second part focused on a key element of innovation management, namely innovation capability assessment. We used the open-source survey software Unit Command Climate Assessment and Survey System (Holmes, 2007) to collect primary data and mailed out personal invitations to 500 randomly selected CEOs/managers in a database of New Zealand organizations. By the survey cut-off date a total of 83 responses were registered (65 male and 18 female), representing a wide range of industries. The two biggest contributions came from the manufacturing (27.7 percent) and professional, scientific and technical services (13.25 percent) industries. More than 70 percent of organizations in the sample have been operating for longer than ten years. By chance the sample was almost equally represented by Small and Medium-sized Enterprises (SMEs) (48.19 percent) and those with twenty or more than full-time employees (51.80 percent) – categorized as large enterprise. (The New Zealand Ministry of Economic Development (2005) define enterprises with nineteen

or less full-time employees as SMEs.) Almost 40 percent of the sample was found to employ more than 50 full-time staff. Approximately one quarter of participating organizations' annual turnover are less than NZ\$1million, another quarter falls into the NZ\$1 to 5 million band, while the remaining 50 percent earn more than NZ\$6 million per annum in revenue. Half the sample operates exclusively in New Zealand, with only approximately ten percent indicating exports in excess of 50 percent originating from export sales.

The survey consisted of 38 questions of which 24 made use of a 7-point Likert-type scale, with added options of 'Don't know' and 'Not applicable'. The analysis focused on the views and attitudes of these managers, firstly towards innovation management in their organizations, and secondly, on the concept of organizational innovation capability assessment.

Results and Implications

When asked if innovation was crucial to the organization's long-term survival and success, the majority of respondents (84.3 percent) felt that this was indeed the case for their organizations. More than half of the respondents strongly agreed with this statement, while nobody indicated that the question was not applicable to their organization. This result indicates that the sample strongly represents organizations that view innovation as relevant to their business models.

Almost three quarters of respondents indicated that they felt comfortable to describe their organizations as being innovative, at least to some degree. However, less than 10 percent claimed to be very innovative. It seems there is a remarkable downward shift when comparing the perceived importance of innovation to how participants regarded their organizations' actual innovation performance. This observation is further supported by an almost across-the-board view that significant scope for innovation improvement exists. More than half the respondents

indicated dissatisfaction with the returns on investment they got from innovation projects, while only about one fifth said they generally achieve great results. Surprisingly, two thirds of the represented organizations have a high incidence of innovations that are not commercialized.

When asked what they thought was the most important condition for innovation, in top spot (37 percent) respondents answered in favor of some organization cultural aspect that supports innovation. Phrases that were used include: “Having a staff and organizational culture that supports creativity”; “A culture that rewards creative thinking and that accepts risk as a natural consequence of change”; “Freedom for ideas to be explored without fear of failure”; “Freedom of thought, encouragement to think outside the square”; “...celebrating and rewarding those that are successful”; “Open communication”; “Flexibility of time and resources for staff to try new techniques or equipment”; “A workshop culture that understands and appreciates the value of failure”; “Willingness to tolerate and fund failure”; “A learning-focused culture”. Of almost equal importance (20percent) and in second place, are the right type of staff (employees) and market-driven innovation. Less important factors that were identified include the right leadership and top management support for innovation, as well as sufficient financial and time resources.

Approximately a quarter of respondents indicated that the most important condition for innovation that they indicated in the previous question, was not present to a satisfactory degree, or being practiced in their organizations.

Over 80 percent of respondents agreed that innovation is a process that can be managed, while only 36 percent acknowledged that it is a difficult process to manage. Nobody rated themselves as excellent managers of innovation. To the contrary, most managers/CEOs rated their organizations’ collective innovation management skills as being quite average. A staggering 30 percent admitted that their organizations were not great at managing innovation.

The one question that resulted in the biggest evenly spread responses across the board, from strongly disagree to strongly agree, was if innovation could be managed without it being measured. Clearly there are mixed opinions on whether measurement is an essential step in the innovation management process. This makes sense when considering that approximately seventy percent of participating organizations do not have a clearly-defined set of innovation indicators. Not surprisingly, when asked if organizations regularly monitor their innovation indicators, the same negative pattern in response was observed as for the preceding question - do you keep innovation metrics?

Conclusions and Future Research

While almost three quarters of the survey respondents viewed innovation as significantly important to their organizations, most indicated that they were underperforming and felt there was significant room for improvement. Only twenty percent of respondents seem to be greatly satisfied with the returns on investment they generally get from innovation projects. This finding is in line with that of The Boston Consulting Group's in the USA, reported earlier. For an alarming 66 percent of represented organizations the reality is low rates of successful commercialization of innovation. An innovation-supportive culture, a strong market focus, and the 'right people on the bus', were identified as the most important criteria for successful innovation. Of concern is that approximately one quarter of respondents said that the criterion which they identified as the most important for successful innovation, was not apparent in their organizations. This deficiency reflects directly against these managers' inability as leaders to champion innovation within their organizations.

The research further indicates that New Zealand managers and CEOs view innovation as a process and generally do not regard it as a particularly difficult one to manage. Yet the results

show that by en large New Zealand organizations are not doing a great job at managing innovation. A partial explanation for this can perhaps be found in the overall inconclusiveness expressed by respondents regarding the issue of whether innovation metrics is essential or not for the effective management of innovation. Contrary to contemporary theory, the majority think it is not essential.

When participants rated their organizations' innovation efforts, nobody chose the 'I don't know' option. A begging question, in the absence of factual innovation metrics, is on what basis the managers/CEOs made these judgments. Were they based on experiences gained over time, or simply based on 'gut feel'? Whatever the reason, if innovation is not measured, any opinion regarding the degree of innovation is highly subjective and purely speculative, and prone to error. Moreover, as shown by this research, managers and CEOs are inclined to overestimate their innovation efforts in the absence of hard evidence.

In conclusion, the paper's findings indicate a number of weaknesses that should serve as call to action for New Zealand managers and CEOs who are not currently getting the innovation results that they desire. As a country New Zealand is lagging its OECD counterparts in many innovation indicators, while its innovation efforts generally fail to create the associated benefits at levels comparable to other developed countries. Strong leadership is lacking in creating 'innovation friendly' cultures in organizations. This is a top-down activity that requires very specific actions to be sanctioned and cultivated by top management over time. A second area of weakness at corporate level is the lack of appropriate innovation metrics and measurement. It could be in the best interest of all stakeholders if organizations start paying the same attention to innovation metrics and treat it with the same degree of importance as they do with corporate financial reporting.

This paper provides a practical framework for managing innovation in firms across a variety of industries and business sectors. By analyzing and assessing each of its key elements separately, it becomes possible to gain a fair view of how well innovation is managed within the organization. Future research could attempt to use the framework as basis for developing a set of new metrics for measuring innovation management within organizations, and assess the current state of affairs within each of the remaining six elements of the innovation management framework.

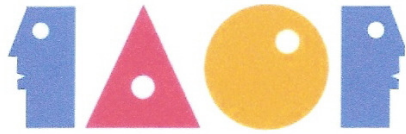
References

- Amidon, D. M. (1998). Blueprint for 21st century innovation management. *Journal of Knowledge Management*, 2(1), 23.
- Anonymous. (2005). Innovation Climate Questionnaire. Retrieved 5 May 2007, from <http://infopoll.net/live/surveys/s27054.htm>
- Aragón-Correa, J. A., García-Morales, V. J., and Cerdón-Pozo, E. (2007). Leadership and organizational learning's role on innovation and performance: Lessons from Spain. *Industrial Marketing Management*, 36(3), 349-359.
- Buhler, P. M. (2002). The manager's role in building an innovative organization. *SuperVision*, 63(8), 20-22.
- Chanal, V. (2004). Innovation management and organizational learning: a discursive approach. *European Journal of Innovation Management*, 7(1), 56-64.
- Cooper, R. G., and Kleinschmidt, E. J. (1987). New Products: What Separates Winners from Losers? *The Journal of Product Innovation Management*, 4(3), 169-184.
- Cooper, R. G., and Kleinschmidt, E. J. (1993). Screening new products for potential winners. *Long Range Planning*, 26(6), 74-81.
- Cormican, K., and O'Sullivan, D. (2004). Auditing best practice for effective product innovation management. *Technovation*, 24(10), 819-829.
- Crescenzi, R. (2005). Innovation and Regional Growth in the Enlarged Europe: The Role of Local Innovative Capabilities, Peripherality, and Education. *Growth and Change*, 36(4), 471-507.

- de Jong, J. P. J., and Den Hartog, D. N. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*, 10(1), 41-64.
- Deming, W. E. (1986). *Out of the crisis*. Cambridge, MA: MIT, Center for Advanced Engineering Study.
- Dillon, T. A., Lee, R. K., and Matheson, D. (2005). Value Innovation: Passport to Wealth Creation. *Research Technology Management*, 48(2), 22-37.
- Dodgson, M., Gann, D. M., and Salter, A. J. (2008). *The Management of Technological Innovation: Strategy and Practice*. Oxford: University Press.
- Donaldson, L. (1996). *For positivist organization theory: Proving the hard core*. London: Sage.
- Eppinger, S. D., and Chitkara, A. R. (2006). The New Practice of Global Product Development. *MIT Sloan Management Review*, 47(4), 22-33.
- Fayol, H. (1949). *General and industrial management*. London: Pitman Publishing Company.
- Gebert, D., Boerner, S., and Kearney, E. (2006). Cross-functionality and innovation in new product development teams: A dilemmatic structure and its consequences for the management of diversity. *European Journal of Work and Organizational Psychology*, 15(4), 431-458.
- Guest, B. (2005) Innovation Management [Electronic Version]. Retrieved 2 June 2006 from <http://www.mibiz.com/absolutenm/templates/coltemplate.asp?articleid=5961&zoneid=140>.
- Gupta, A. K., and Wilemon, D. (1990). Improving R&D/Marketing Relations: R&D's Perspective. *R & D Management*, 20(4), 277-290.
- Holmes, J. W. (2007). Unit Command Climate Assessment and Survey System (UCCASS). Retrieved 2 April 2007, from <http://www.bigredspark.com/survey.html>
- Ideaction. (2007) Innovative Organization [Electronic Version]. Retrieved 13 July 2007 from http://www.ideaction.net/organization_index.asp.
- IdeasAccelerator. (2007). Innovation Monitor. Retrieved 26 March 2007, from <http://www.ideasaccelerator.com>
- Innovation Network. (2007). Innovation Audit: Knowing where to begin. Retrieved 27 June 2007, from <http://www.thinksmart.com/mission/audit.html>
- Jamrog, J., Vickers, M., and Bear, D. (2006). Building and Sustaining a Culture that Supports Innovation. *HR. Human Resource Planning*, 29(3), 9-19.

- Koen, P. A., Ajamian, G. M., Boyce, S., Clamen, A., Fisher, E., Fountoulakis, S., et al. (2002). Fuzzy Front End: Effective Methods, Tools, and Techniques. In P. Belliveau, A. Griffin & S. Somermeyer (Eds.), *The PDMA ToolBook 1 for New Product Development* (pp. 5-35). New York: John Wiley & Sons, Inc.
- Markham, S. K. (2002). Research on the Management of Innovation: The Minnesota Studies. *The Journal of Product Innovation Management*, 19(3), 253-256.
- Matheson, D., and Matheson, J. (1998). [The smart organization]. *The Economist*, 348(8076), Survey.
- Mercer Management Consulting Inc. (1994). *High Performance New Product Development: Practices That Set Leaders Apart*. Boston, MA: Mercer Management Consulting, Inc.
- Ministry of Economic Development. (2003). Growth and Innovation Indicators: Broad Findings. Retrieved 5 April 2008, from http://www.med.govt.nz/templates/MultipageDocumentPage____1870.aspx
- Ministry of Economic Development. (2005). Growth Through Innovation: Economic Development Indicators. Retrieved 22 June, 2008, from http://www.med.govt.nz/templates/MultipageDocumentTOC____38424.aspx
- Muller, A., Välikangas, L., and Merlyn, P. (2005). Metrics for innovation: guidelines for developing a customized suite of innovation metrics. *Strategy & Leadership*, 33(1), 37-45.
- National Centre of Excellence in Functional Foods. (2006). Innovation Audit. Retrieved 2 July 2007, from <http://www.nceff.com.au/innovation/innovation-audit.htm>
- Organization for Economic Co-operation and Development (OECD). (2005). Economic Survey of New Zealand 2005. Retrieved 4 July 2006, from http://www.oecd.org/document/59/0,2340,en_2649_34569_35059387_1_1_1_1,00.html
- Peters, T. J., and Waterman, R. H. (1982). *In Search of Excellence*. New York: Harper & Row.
- Pinchot, E., and Pinchot, G. (1996). Seeding a climate for innovation. *Executive Excellence*, 13(6), 17-18.
- Porter, M. E., and Schwab, K. (2005). *The Global Competitiveness Report 2005-2006: Policies Underpinning Rising Prosperity (Global Competitiveness Report)*: World Economic Forum Geneva.
- Prospero, M. A., Conley, L., and Underwood, R. (2005). INNOVATION Scorecard. *Fast Company*, (93), 65-67.

- Rae, J. (2006) Closing the Gap on Innovation Metrics [Electronic Version]. *Business Week*. Retrieved 12 May 2008 from http://www.businessweek.com/innovate/content/apr2006/id20060428_377270.htm.
- Saleh, S. D., and Wang, C. K. (1993). The management of innovation: Strategy, structure, and organizational climate. *IEEE Transactions on Engineering Management*, 40(1), 14-21.
- Sheppard, B., and Canning, M. (2006). Innovation Culture. *Leadership Excellence*, 23(1), 18.
- Statistics New Zealand. (2003). Innovation in New Zealand 2003. Retrieved 24 March, 2008, from http://www2.stats.govt.nz/domino/external/web/prod_serv.nsf/htmldocs/Innovation+in+New+Zealand+2003
- Tate, W. (2003). *The Business Innovation Audit*: Cambridge Strategy Publications Ltd.
- Te Kaihau the Windeaters. (2007). Innovation Audit. Retrieved 1 July 2007, from <http://www.windeaters.co.nz/audits/innovation.htm>
- The Idea Centre. (2007). Preview of Idea and Innovation Survey. Retrieved 25 June 2007, from <http://www.ideacentre.com.au/preview.htm>
- Thunderbolt Thinking. (2007). Innovation Survey. Retrieved 22 June 2007, from <http://www.thunderboltthinking.com/survey.htm>
- Tidd, J., Bessant, J., and Pavitt, K. (2005). *Managing Innovation - Integrating technological, market and organizational change* (3rd ed.). Australia: John Wiley and Sons.
- Tidd, J., Bessant, J., and Pavitt, K. (2007). Innovation Management Toolbox. Retrieved 25 May 2007, from <http://www.wiley.co.uk/wileychi/innovate/website/index.htm>
- Tidd, J., and Bodley, K. (2002). The influence of project novelty on the new product development process. *R&D Management*, 32(2), 127-138.
- Venables, M. (2005). The innovation trap. *Manufacturing Engineer*, 84(3), 6-7.
- Wolfe, R. A. (1994). Organizational innovation: Review, critique and suggested research directions. *The Journal of Management Studies*, 31(3), 405-431.



KNOWLEDGE SOURCING BEHAVIOR: A THEORETICAL MODEL BASED ON KNOWLEDGE BASE AND NETWORK RELATIONSHIP PERSPECTIVES

Chien-Hsiung Lin

Department of Hospitality Marketing & Convention Management
National Kaohsiung Hospitality College,
axel@mail.nkhc.edu.tw

Abstract

This study attempts to explore whether, what, and how to conduct the decision making in knowledge sourcing (KS), furthermore, it clarifies the why issue, i.e., the antecedents that determine KS behaviors. Though the theoretical perspectives of knowledge base and network relationship, the study argued that to replenish the existing knowledge and to set up a long-term and inter-dynamic relationship, especially in this globally competitive environment, are quite attractive motivations for firm's behavior of KS. We develop propositions to support this reasoning of KS model. Conclusion toward KS practices and future research are provided in the end of this paper.

Key Words: Knowledge Sourcing, Knowledge Base, Network Relationship,
Inter-Dynamic Relationship.

Introduction

According to the literature, knowledge is defined as “justified true belief” (Audi, 1995), and it is understood as information validated by experience. For firm such knowledge defines its capacity to efficiently convert inputs into valuable outputs, and it is usually regarded as a principle source of competitive advantage (e.g., Spender and Grant, 1996). Hence, after the 1990s, knowledge management (henceforth referred to as KM) plays a critical role in the business academy. Most studies, however, have investigated KM on supply-side issues such as sharing, learning, and creating (e.g., Cohen & Levinthal, 1990; Simon, 1991; Nonaka, 1994), while relatively few attentions has been paid on demand for knowledge (Gray & Meister, 2004) such as behavior of knowledge sourcing (henceforth referred to as KS).

As a matter of fact KM needs considerable support from R&D activities and technological infrastructure (Lee & O’Keefe, 1996; Raymond, 2003). Larger firms naturally can afford a great amount of R&D resources; while smaller ones, especially in less-developed countries, find it harder to gain enough and equivalent R&D resources and investment as do their larger competitors. Given the competitive realities and the globalizing environment firms face the most challenge to survive all-time. Thus they must create knowledge faster than their rivals (Prahalad & Hamel, 1990; Teece & Pisano, 1994) and then rapidly translate new knowledge into new product (Grant, 1996). That is why it is very important for firms to concern whether, what, and how to source knowledge in order to free from these pressures.

The focus of this study is to explore KS behavior in firm level, with emphasis on the effects of knowledge base and network relationship. It is important to note that separately regard knowledge base and network relationship as two important antecedents, and they are used to

understand and assess the internality and externality of firm ('A course of know yourself as well as enemy', as the Chinese saying goes). As soon as firms realize their strengths, weaknesses, opportunities and threats, and recognize some new knowledge in need. KS model from the perspective of decision-making is established to support them (particularly for multinational enterprises, MNEs) in making decisions of whether, what, and how to source knowledge globally. Then, to achieve knowledge application effectively and efficiently is expected from this behavior of KS.

Theory and Research Framework

Knowledge environment such as explosive growth, extensively dispersed fragment and globalization in which firm embedded nowadays is far and away more complicated than before. It is obvious that the development and management of knowledge has already been different from the past. This is giving the rise of importance for firms in decision-making about how, whether and what to source the valid knowledge. There are many way to source knowledge such as make (research and development by oneself), buy (outsourcing), strategic alliance, joint-venture, R&D cooperation, etc. But no matter which kinds of KS a firm decides to take, the decision making is deeply influenced by its own knowledge base and network relationship among others.

Types of Knowledge Sourcing Behavior

Based on Harasim's (1989) argument, Gray and Meister (2004) proposed three different types of KS behavior (dyadic KS, published KS and group KS) for level of analysis in individual. Here we would like to upgrade the level to consider firm's behavior. Lin and found Yen and Tarn (2007) initially proposed the KS model by means of answering four questions. These four questions are: (1) Can a firm develop knowledge on its own? (2) Does a firm need to

source knowledge from external providers? (3) Does a firm need to source knowledge which is heterogeneous from the existing one? (4) How does a firm manage the interface activities through knowledge? The result is classified KS model into four modes and named as Knowledge Allocation, Development, Deal, and Initiation (see Figure 1). The definitions and the related interface activities describe in detail as follows.

	Consistent with Existing Knowledge	Inconsistent with Existing Knowledge
Intra-firm KS	Knowledge Allocation	Knowledge Development
Inter-firm KS	Knowledge Deal	Knowledge Initiation

Figure 1. Taxonomy of Knowledge Sourcing Model (adapted from Lin, Yen and Tarn, 2007)

Knowledge Allocation is defined as the KS conducted within the firms while the knowledge is consistent with the existing one, and they are sourced from their kindred branches/subsidiaries. In practice its related interface activities are such as: *Knowledge Learning and Internalization* (Nonaka & Takeuchi, 1995; Sanchez & Heene, 1997; Lincoln, et al., 1998; Sarvary, 1999), *Sharing Sourced Knowledge to Members of Knowledge Takers* (Nil, 1988; Cohen & Levinthal, 1990; Simonin, 1997; Birchall et al., 2001; Saggi, 2002; Hu & Jaffe, 2003), *Adapting the Sourced Knowledge* (Cohen & Levinthal, 1990; Bonora & Revang, 1991), *Delegating KS Responsibility and Duty* (Niefer, 1990; Drucker, 1993), and *Knowledge Reverse Circulation* (Spek & Spijkervet, 1997; Nil, 1988; Cohen & Levinthal, 1990; Gardener, 1990).

Antecedents of Knowledge Sourcing

Chinese saying: to know the enemy and know yourself and you can fight a hundred battles with no danger of defeat. This study separately regards knowledge base and network relationship as two antecedents of KS behavior, and they are used to understand and assess the internality and externality of firm.

Knowledge Base Perspective

KM is widely discussed in the management literature. Verkasalo and Lappalainen (1998) define three schools of thought on KM. They are knowledge-creating school, core-competence school and knowledge-base school.

The knowledge-creating school represented by Nonaka (1994), identifies the different type of knowledge (tacit or explicit knowledge) and shows how to transform one type into the other, emphasizing the role of middle management in this process. The concept of absorptive capacity (Cohen and Levinthal, 1990) is closely related to the knowledge-creating school since it concerns the assimilation of new knowledge.

The core-competence school, using a resource-based approach, studies how the competencies at the firm's disposal can be made to contribute to its performance (Hamel and Prahalad, 1994). Transfer and integration successful are considered if it makes short- or long-term contributions to business decisions.

The boundaries of firm should encompass its valuable competencies and core knowledge (Argyres, 1996; Prahalad & Hamel, 1990). The emerging literature on the knowledge-based view of the firm not only explains why firms exist by articulating the knowledge-based advantages of hierarchy (Conner & Prahalad, 1996; Kogut & Zander, 1996) but also when firms exist and what form (Nickerson & Zenger, 2004). Many studies even point out that the firms' practices toward

generation of knowledge can have substantial effects on their performance (e.g. Conner, 1991; Teece, Pisano, and Shuen, 1997).

Knowledge is a principle source of competitive advantage (Spender and Grant, 1996), the good knowledge base of firm can improve competitive advantage and generate new knowledge effectively (Nonaka, 1994; Grant, 1996). But due to the difference on organizational goal, characteristics, human resources and competitive strategy, firms ought to be careful in implementing KS method. Based on knowledge-based perspective, therefore, by mean of replenishing the existing knowledge to increase competitive advantage is an attractive motivation for firm's behavior of KS.

P1: There has an association between the knowledge base and decision-making behavior of knowledge sourcing; moreover, to replenish the existing knowledge is an attractive motivation for firm's behavior of KS.

Network Relationship Perspective

According to literature organizational network is the long-term relation between two or more firms, in which the relation has neither built on functions of marketing nor on formal bureaucracy. It also widely regarded as a means for quick access to resources and know-how that cannot be produced internally (Powell et al., 1996; Powell, 1998; Castilla et al., 2000; Thompson, 2003). The long-term relations between firms can lead to developing trust (Gulati, 1995; Gulati and Gargiulo, 1999), to learning about each other's competencies (Gulati and Gargiulo, 1999), and to developing common and redundant knowledge and understanding (Ahuja, 2000; McEvily and Zaheer, 1999). But it is necessary to comprehend the quality of the relationships between network firms.

This study defines network relationship as a long-term inter-dynamic relationship that set up in order to obtain extensive knowledge and interests effectively, and no limitation on its

network targets. In the meanwhile to regard network relationship as firm's external factor to echo the Chinese saying: a course of know your enemy.

P2: There has an association between the network relationship and decision-making behavior of knowledge sourcing; moreover, to set up a long-term inter-dynamic relationship is an attractive motivation for firm's behavior of KS.

Outcome of Knowledge Sourcing

There have three stages in applying knowledge management effectively: knowledge generation, knowledge dissemination, and knowledge application (e.g., Bij, Song, and Weggeman, 2003; Coombs and Hull, 1998; Zack, 1999). Additionally information exchange is essential, organizational learning theory offers some relevant observations as well (Simonin 1997). Organizational learning consists of a number of stages that typically include information acquisition, information dissemination, shared interpretation, knowledge utilization, and evaluation (Day 1994; Fiol and Lyles 1985; Huber 1991; Sinkula 1994; Moorman and Miner, 1997). This study argues that the process of knowledge application may result from the behavior of KS. Besides knowledge is a main source of competitive advantage, the knowledge-based theory of the firm also focuses on the process of knowledge-application.

P3: There has an association between the decision-making behavior of knowledge sourcing and knowledge application; moreover, knowledge application is an expected outcome.

Research Framework

Figure 2 shows the conceptual framework guiding the present study. It is important to note that separately regard knowledge-based and network relationship as two important antecedents, and knowledge application is as an outcome of KS. Four modes of KS model from

the perspective of decision-making is established to support firms in making a decision of whether, what, and how to source knowledge globally.

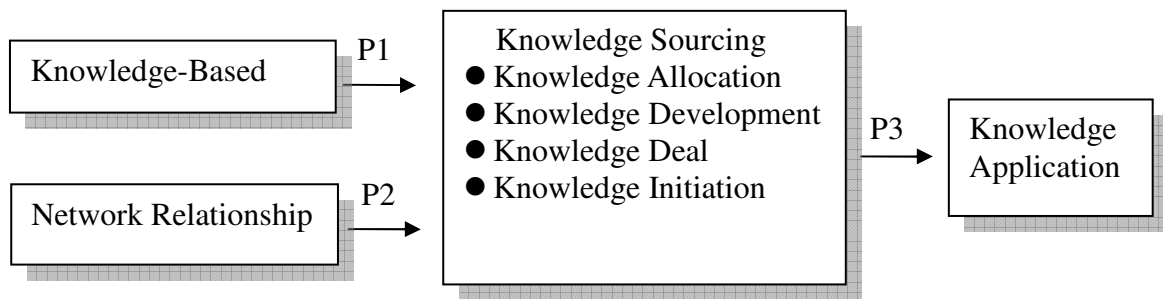


Figure 2. Research Framework

Conclusion

This study provides theoretical insight and builds a more comprehensive understanding of KS behavior. As claimed in proposition 1 and 2, especially in this globally competitive environment, to replenish the existing knowledge and to set up a long-term inter-dynamic relationship are quite attractive motivation for firm's behavior of KS. Then via the four modes of KS model from the perspective of decision-making we expect to achieve knowledge application effectively and efficiently as suggested in proposition 3.

This study not only explores whether, what, and how to conduct the KS decision, but also clarifies the why issue, i.e., the antecedents that determine KS behaviors. As an academic article, however, this study still remains a lot to be learned. A crucial early step is to empirically test the reliability and validity of the model. Future research could endeavor to design the measurement

scale or interviewing checklist, and accordingly test whether this model matches the KS practices.

References

- Ahuja, G. (2000). 'Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study', *Administrative Science Quarterly* 45(3):425–455.
- Argyres, N. (1996). 'Evidence on the role of firm capabilities in vertical integration decision', *Strategic Management Journal*, 17:129-150.
- Audi, R. (1995). *The Cambridge Dictionary of Philosophy*, Cambridge, UK: Cambridge University Press.
- Bij, H., Song, M. and Weggeman, M. (2003). 'An Empirical Investigation into the Antecedents of Knowledge Dissemination at the Strategic Business Unit Level', *Journal of Product Innovation Management* 20(2):163–179 (March).
- Birchall, D., Tovstiga, G. and Chanaron, J. (2001) 'Capabilities in strategic knowledge sourcing and assimilation: A new look at innovation in the automotive industry', *International Journal of Automotive Technology and Management*, 1: 78-91.
- Bonora, E.A. and Revang., O. (1991) 'A strategic framework for analyzing professional service firm - Developing strategies for sustained performance', in *Strategic Management Society Interorganizational Conference*, Canada.
- Castilla, E. J., Hwang, H., Granovetter. E. and Qranovetter, M. (2000) Social networks in Silicon Valley, in: C.-M. Lee, W. F. Miller, M. G. Hancock & H. Rowen (Eds). *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship*, pp. 218-247 (Stanford, CA: Stanford University Press).
- Cohen, Wesley M. and Levinthal, D. A. (1990) 'Absorptive capacity: A new perspective on learning and innovation', *Administrative Science Quarterly*, 35(1): 128-132.
- Conner, K. R. (1991). 'A historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm?' *Journal management*, 17(1): 121-154.

- Conner, K. R. and Prahalad C. K. (1996). 'A resource-based theory of the firm: Knowledge versus opportunity', *Organization Science*, 7(5): 477-501.
- Coombs, R. and Hull, R. (1998). 'Knowledge Management Practices and Path-Dependency in Innovation', *Research Policy* 27(3):237-253.
- Day, G. S. (1994). 'The Capabilities of Market-Driven Organizations', *Journal of Marketing* 58:37-52 (October).
- Drucker, P. F. (1993) *Post-Capitalist Society*, Oxford: Butterworth Heinemann.
- Fiol, C. M. and Lyles, M. A. (1985). 'Organizational Learning', *Academy of Management Review* 10(4):803-813.
- Gardener, M. (1990) 'Baden-Wurttemberg's science policy-boosting international competitiveness', *Industry and Higher Education*, 4(2): 113-118.
- Grant, R. M. (1996) 'Toward to a knowledge-based theory of the firm', *Strategic Management Journal*, 17(winter): 109-122.
- Gray, P. H. and Meister, D. B. (2004). 'Knowledge Sourcing Effectiveness', *Management Science* 50(6): 821-834.
- Gulati, R. (1995). 'Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances', *Academy of Management Journal* 38(1):85-112.
- Gulati, R. and Gargiulo, M. (1999). 'Where Do Organizational Networks Come from?', *American Journal of Sociology* 104(5): 1439-1493.
- Harasim, L. (1989). *On-line education: A new domain*. R. Mason, A. Kaye, eds. *Mindweave: Communication, Computers, and Distance Education*. Pergamon Press, Oxford, U.K., 50-62.
- Hu, A. and Jaffe, A. (2003) 'Patent citations and international knowledge flow: The cases of Korea and Taiwan', *International Journal of Industrial Organization*, 21: 848-880.
- Huber, G. P. (1991). 'Organizational Learning: The Contributing Processes and the Literature', *Organization Science* 2:88-115 (February).
- Kogut, B. and Zander, U. (1996). 'What firm do: Coordination, identity, and learning', *Organization Science*, 7(5): 502-518.

- Lee, S. and O'Keefe, R.M. (1996). 'The Effect of Knowledge Representation Schemes on Maintainability of Knowledge-Based Systems', *IEEE Transactions on Knowledge and Data Engineering*, 8(1):173–178.
- Lin, C., Yen, D. C., Tarn, D. C. (2007). 'An industry-level knowledge management model—a study of information-related industry in Taiwan', *Information & Management* 44 (1): 22–39.
- Lincoln, J. R., Ahmadjian, C. L. and Mason, E. (1998) 'Organizational learning and purchase-supply relationship in Japan: Hitachi, Matsushita, and Toyota compared', *California Management Review*, 40(3): 241-264.
- McEvily, B. and Zaheer, A. (1999). 'Bridging Ties: A Source of Firm Heterogeneity in Competitive Capabilities', *Strategic Management Journal* 20(12):1133–1156.
- Moorman, C. and Miner, A.S. (1997). 'The Impact of Organizational Memory on New Product Performance and Creativity', *Journal of Marketing Research* 34:91–106 (February).
- Nickerson, J. A. and Zenger, T. R. (2004). 'A knowledge-based theory of the firm – the problem-solving perspective', *Organization Science*, 15(6): 617-632.
- Niefer, W. (1990) 'Technological expertise and international competitiveness: Why new strategies are needed', *Ciemens Review*, 57(4): 4-9.
- Nil, S. (1988) 'Role of S&T in economic competitiveness', *Outlook on Science Policy*, 10(4): 38-40.
- Nonaka, I and Takeuchi, H. (1995) *The Knowledge-creating Company*, NU: Oxford University Press.
- Nonaka, I. (1994). 'A Dynamic Theory of Organizational Knowledge Creation', *Organization Science*, 5(1):14–37.
- Powell, W. W. (1998) 'Learning from collaboration: knowledge and networks in the biotechnology and pharmaceutical industries', *California Management Review*, 40(3): 228-240.
- Powell, W. W., Koput, K. W. and Smith-Doerr, L. (1996) Interorganizational collaboration and the locus of innovation: networks of learning in biotechnology, *Administrative Science Quarterly*, 41: 116-145.
- Prahalad, C. and Hamel, G. (1990). 'The Core-Competence of the Corporation', *Harvard Business Review*, 68:79–91 (May–June).

- Raymond, L. (2003) 'Globalization, the knowledge economy, and competitiveness: A business intelligence framework for the development SMES', *Journal of American Academy of Business*, 3: 260-271.
- Saggi, K. (2002) 'Trade, foreign direct investment, and international technology transfer: A survey', *The World Bank Research Observer*, 17: 191-235.
- Sanchez, R. and Heene, A. (1997) *Strategic Learning and Knowledge Management*, John Wiley & Sons.
- Sarvary, M. (1999) 'Knowledge management and competition in the consulting industry', *California Management Review*, 41(2): 95-107.
- Simon, H.A. (1991). 'Bounded Rationality and Organizational Learning', *Organization Science*, 2(1):125–134.
- Simonin, B. L. (1997). 'The Importance of Collaborative Know-How: An Empirical Test of the Learning Organization', *Academy of Management Journal* 40(5):1150–74.
- Sinkula, J. M. (1994). 'Market Information Processing and Organizational Learning', *Journal of Marketing* 58:35–45 (January).
- Spek, R. van der, and Spijkerver, A. (1997) 'Knowledge management: dealing intelligence with knowledge' in J. Liebowitz and L. C. Wilcox (eds.) *Knowledge Management and Its Integrative Elements*, NY. : CRC Press.
- Spender, J.C. and Grant, R.M. (1996). 'Knowledge and the Firm: Overview', *Strategic Management Journal*, 17:5–9 (Winter Special Issue).
- Tecce, D., Pisano, A. and Shuen, A. (1997). 'Dynamic capabilities and strategic management', *Strategic Management Journal*, 18(7): 509-533.
- Teece, D. and Pisano, G. (1994). 'The Dynamic Capabilities of Firms: An Introduction', *Industrial and Corporate Change*, 3(3):537–556.
- Thompson, G. (2003) *Between Hierarchies and Markets: The Logic and Limits of Network Firms of Organization* (Oxford: Oxford University Press).
- Verkasalo, M. and Lappalainen, P. (1998). 'A Method of Measuring the Efficiency of the Knowledge Utilization Process', *IEEE Transactions on Engineering Management*, 45(4):414–423.
- Zack, M. H. (1999) 'Developing a knowledge strategy', *California Management Review*, 41(3): 125-145.

THE ROLE OF WORK, SATISFACTION, ACHIEVEMENT
AND SELF-REALIZATION

Ching-Hsiang Liu
Department of Business Administration
National Formosa University, Taiwan
graceliu89@hotmail.com

Abstract

The importance of the service industry has been widely recognized in recent years and it has become a key area in the economic development of Taiwan. As the service industry is capital intensive, has high value-added products and requires a greater number of outstanding professionals, human resources management is critical for service industry. The purpose of this study is to explore the relationship between work values and career orientation in service industry workers. Structural equation modeling revealed that each aspect of work values had a significant influence on career orientation. The conclusion was used by the study to offer practical and academic recommendations.

Keywords: Work, Satisfaction, Achievement, Self-Realization

Introduction

The service industry is generally considered emphasizing quality and speed. The hours are long with heavy workloads as well. Generally speaking, the careers of service industry workers are relatively short. If managers don't understand what the employees want to achieve with their hard work and arbitrarily promote or transfer exceptional workers, they may end up causing job dissatisfaction instead. This does not mean these employees don't have a sound career goal. The difference is that these employees' career orientations are not geared towards promotions but a desire to focus on their own particular specialty. This study will therefore explore in more depth the work values and career orientations of service industry workers.

Literature Review

Work Values

"Values" is an abstract concept with implications on the cognitive, behavioral and emotional level. The usual means of expression is through choices and evaluation. Rokeach (1973) believed that values are a type of persistent belief which defines an individual or a society's preferences in certain behaviors or matters. A value is not human behavior or a particular matter. It is the standard used for judging good and bad or right and wrong. In other words, it is a frame of reference for making decisions. If several value beliefs or orientations can be combined into an inter-related system, it becomes a value system, or "values" for short. Kluckhohn (1951) proposed that values are unique explicit or implicit philosophy held by an individual or group regarding matters they have influence over. It's a concept of what is good, right and worthy. This philosophy in turn influences the decisions made on the existing situation, methods and objectives.

Right and wrong is implied in values and suggests that some behaviors of results is what we prefer. "Objectivity" and "Reason" is therefore nowhere to be seen in values. It is the basis for understanding attitudes, senses, personality and motivations (Robbins, 1992).

Enz (1986) felt that there were four types of values:

- (1) Environment
- (2) Work
- (3) Relationship
- (4) Individual

The focus of this study is to explore values centered upon work. Work values are a part of the individual value system and most of its definition is an extension of the implications in "values". Academics believe that the value tendencies reflected by certain types of work as well as the rules, ethics, morality and principles involved are all representations of work values. Psychologists traditionally refuse to give work values a specific definition but the majority do agree that work values are the basic framework expressed by individual preferences on the different qualities of work. Nord, Brief, Atich & Doherty (1988) considered work values to be a result of an individual's expectations that they feel can be realized through work. In summary, the attributes of work values are as follow:

- (1) An intrinsic driving force that pushes an individual to move towards their life goals. It also guides the direction and motivation of their behavior.
- (2) A standard on which personal judgments are based. It provides a basis for making personal calculations and evaluations in order to moderate the relationship between work orientation and emotions. It is used to assess what is important and what is not.

- (3) It is an ordered system and structure. Work values contain many kinds of different values with differences in importance.
- (4) Its purpose is the satisfaction of individual requirements, or an expression of requirements.
- (5) It is a type of belief that involves cognition, emotions and guidance.

From the above descriptions of work values, work values should be the level of importance or preference felt by an individual towards work. It is a part of an individual's work preferences and tendencies, and apart from guiding individual work behaviors and performance, it also offers a guide in career choices.

Career Orientation

Career development refers to a contiguous stage in an individual's life. The process cultivates an individual's identification with their career and promotes the maturing of their plans and career. This lifelong behavioral history and influence results in the individual's work values, occupational choices, career type, role integration, self- and career-identification, level of education and related phenomena (1984). Bailyn (1980) considered career development to be the overall process where an individual joins an organization then seeks growth and development within the organization. Schein (1978) treated career development as how experiences in the work environment are developed into an awareness of one's own abilities, attitudes and values.

Career orientation, also referred to as career anchor, is the integration of individual requirements, attitudes, values and abilities in career development. The career anchor concept was first proposed by Schein (1978). Schein emphasized the necessity of constructing a model that describes an individual's self-concept of their career and one that reflects their business career experiences and values. The career anchor concept is very influential as a person's self-

conception will both guide and limit their future career decisions. When a person's business career begins, a life anchor that stabilizes and guides their business career gradually forms. Career development is a type of self-concept for life. It is a self-image shaped through attempts and experiences made over a long period of time in self-development, learning, family and work. It also means that every person has their own logic when it comes to making career decisions. Each person will take a different career path even if they are placed in the same environment. Experts have also pointed out that the intrinsic career is subjective thinking about a person's goals and direction in work and life. By comparison, the extrinsic career looks at the goals and direction of an individual's planned stages and roles in the workplace from the perspective of organizational policy and social beliefs.

Career orientation is gradually formed over time. With the passage of time and increasing experience, the individual will adjust their career decisions based on needs, education or environment. Nevertheless, their basic career orientation will guide their search for the most appropriate direction of development and in turn, allow them to balance self-development, work and family. Aryee & Leong (1991) defined career orientation as "work-related values that reflect a person's preferences on type of work, performance standards, and identification with the nature of their work."

Work Values and Career Orientation

A person's work attitude and work performance is usually considered to be linked to their individual values. A person's views of work values will affect their choice of profession as well as development and performance. Attitude and values are still linked in significant ways however. When an individual's values can't be reconciled with the organization, it may lead to job dissatisfaction or even departure (Brenner, Blazini & Greenhaus, 1998). Iverson, Mueller &

Price (2004) felt that work values and career orientation will determine individual satisfaction with their goals and work. There is also a significant relationship between the career orientation of professional researchers and their attitudes and behaviors within the organization. Employees with different work values will have different goals and this will influence their career orientation. Understanding the individual work values of employees and their career orientation is therefore a very important issue.

Methodology

Based on the motivation for the study and the results of the literature review, we proposed the research frame shown below in Fig. 1.

Based on the framework and purpose of this study, we propose the following research hypotheses:

Hypothesis 1. There is a significant correlation between the factors in work values and career orientation.

Hypothesis 1.1. There is a significant correlation between "Work " and career orientation.

Hypothesis 1.2. There is a significant correlation between "Satisfaction" and career orientation.

Hypothesis 1.3. There is a significant correlation between "Achievement " and career orientation.

Hypothesis 1.4. There is a significant correlation between "Self-realization" and career orientation.

Research Framework and Hypotheses

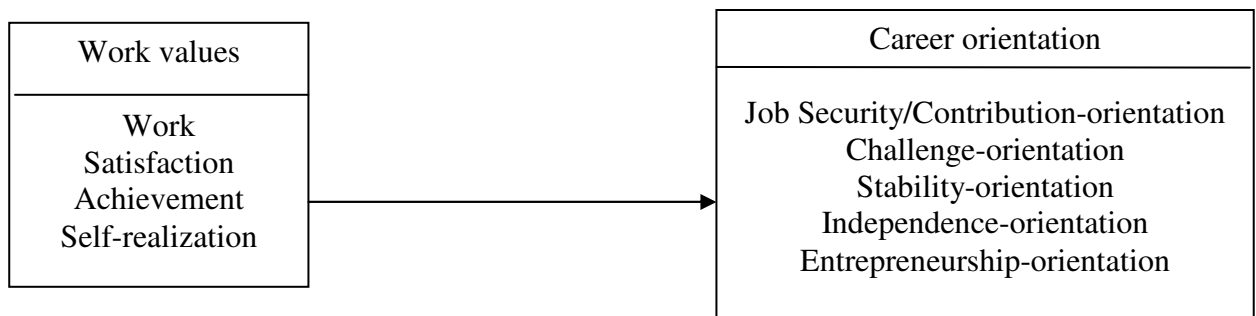


Figure 1. Structural Equation Modeling

Scale Design

Work Values

The measurement questionnaire was based on the work values scale developed by Wong & Chung (2003). The survey consisted of 18 questions with work values divided into the four factors "Work-orientation", "Satisfaction", "Achievement-orientation" and "Self-realization" for further study. The questions are based on the Likert 5-point scale with respondents asked to tick options ranging from "Strongly Disagree" to "Strongly Agree" and assign a score between 1 to 5. All of the questions were positively worded and a higher score indicated better defined employee work values.

Career Orientation

The career orientation inventory was based on a condensed version of the Schein (1985) Career Orientations Inventory (COI) developed by Igarria & Baroudi. This scale consisted of 25 questions based on the Likert 5-point scale. The scale was divided into the following five factors: "Job Security/Contribution-orientation", "Challenge-orientation", "Stability-orientation", "Independence-orientation" and "Entrepreneurship-orientation". The questions are based on the Likert 5-point scale with respondents asked to tick options ranging from "Strongly Disagree" to "Strongly Agree" and assign a score between 1 to 5. All of the questions were positively worded and a higher score indicated better defined employee career orientation.

Research Results

Structural Equation Model

This study used structural equation modeling (SEM) to explore the cause and effect relationship between work values and career orientation as well as for verifying the fit of the overall model. The overall goodness-of-fit for the overall model results are sound.

When analyzing the goodness-of-fit for the overall model, the Chi-square value was 83.95 while Chi-square/df was 2.877 (Chi-square/df < 3). The Chi-square value did not meet the evaluation criteria (significance of χ^2 was greater than 0.1) possibly because due to the sample size (the number of effective samples in this study was 241). GFI = 0.96 (greater than 0.9), AGFI=0.92 (greater than 0.9); RMR=0.044 (less than 0.05), SRMR=0.054 (close to 0.05); NFI=0.91 (greater to 0.9), NNFI=0.92 (greater than 0.9) and CFI=0.93 (greater than 0.9). All of these indicators met the standard for acceptable fit, so the overall model offered a good fit.

Conclusion and Recommendations

Conclusion

This meant that work values had a positive and significant influence on career orientation and demonstrated that the more well defined the work values, the more aware employees are about career orientation. Such an outcome suggests if corporations can understand the work values of recruited employees and assign them a suitable role, then career orientation can be matched to the organization's career management to achieve a win-win outcome.

Recommendations

One of the factors that determine the success or failure of a business is whether it made effective use of human resources management. This is related to the development of the employee's work values and career orientation. An employee's personal work value is related to whether they prefer challenging tasks, their willingness to contribute to the organization, their love of their work and pursuit of promotion. Based on the research results, this study offers the following recommendations:

The service industry now plays an important role in driving economic development in Taiwan. While service workers enjoy excellent benefits and compensation, the emphasis on

specialization, well-defined organizational hierarchies and strong competition makes promotions hard to come by. As there is intense competition for positions, an employee must understand how each enterprise operates and its culture during the job-seeking phase. They must also choose their company based on their own personal work values and orientation.

Due to the intense competition for positions, employees must understand how each enterprise operates and its culture during the job-seeking phase. They must also choose their company based on their own personal work values and orientation. It is quite important to find an enterprise that suits the individual as well as positions that match the individual's work values and career orientation. This will avoid working hard only to discover that the development options that the company can offer don't match the worker's ambitions. In some cases, it may offer no benefits towards the realization of career goals or even impede their realization.

This study found that those with more obvious work values had better defined career orientations. It is therefore important for each employee to let the manager know their requirements so that a mutually beneficial strategy can be arrived through discussion. For a hard-working employee who performs well, being able to discuss with the manager on how the employee can gradually realize their career goals or be given a position that better utilizes their talents not only helps to improve business performance but will help the employee move closer to realizing their career goals.

Based on the above, employees must not only understand their own strengths, weaknesses, work values and gradually realize their career orientation, they should also not reject assignments that will build their experience and offer promotion opportunities. Being willing to accept these assignments and being proactive will allow them to create value for themselves and for the company.

References

- Aryee, S. & Chong Chee Leong. (1991), *Career orientations and Work Outcomes Among Industrial R & D Professionals*, *Group & Organization Studies*, 16(2), 193-205.
- Bailyn, L., (1980), *Living with Technology. Issues at Mid Career*. Cambridge, MA: MIT Press.
- Brenner, O. C, Blazini, A. P. & Greenhaus, J. H. (1988). An Examination of Race and Sex Differences in Managerial Work Values. *Journal of Vocational Behavior*, 32:336-344.
- Delong (1982), *Reexamining the career anchor model*. *Personnel*, 59(3), 50-63.
- Enz, C. (1986), *Power and Shared Value in the Corporate Culture*, Ann Arbor, MI : UMI.
- Gartland, C. T. (1984). *Individual Differences and Historical Trends in Work Values of Employed Adults*. Doctoral Dissertation, The graduate School of University of Minnesota.
- Herr, E. L. & Cramer, S. H. (1984), *Helping to Build Careers, Infoworld*, 99-100.
- Igbaria, M. & Baroudi, J. J. (1993), *A Short-Form Measure of Career Orientations: A Psychometric Evaluation*, *Journal of Management Information Systems*, 10, Z, pp. 131-154.
- Iverson, R. D., Mueller, C. W., & Price, J. L. (2004), Revisiting the cosmopolitan-local construct. An event history analysis of employee turnover. In R. Griffeth & P. Hom (Eds.), *Innovative theory and empirical research on employee turnover* (pp. 55–72). Greenwich, CT: Information Age Publishing.
- Kluckhohn, C. (1951). *Toward a General Theory of Action*. Cambridge, M.A.: Harvard University Press.
- Nord, W. R., Brief, A. P., Atich, J. M. & Doherty, E. M. (1988). Work Values and the Conduct of Organizational Behavior. *Research in Personnel and Human Resources Management*, 10, 1-42.
- Robbins, S. P. (1992). *Essentials of Organizational Behavior*. Prentice Hall International.
- Rokeach, M. (1973). *The Nature of Human Values*. New York : Free Press.
- Schein, E. H. (1978), *Career Dynamics : Matching Individual and Organizational Needs*. Redding, MA: Addison-Wesley.
- Schein, E. H. (1985), *Organizational Culture and Leadership. 1st ed*. San Francisco: Jossey-Bass Publishers.
- Wong, C. S. & Chung, K. M. (2003). Work Values of Chinese Food Service Managers. *International Journal of Contemporary Hospitality Management*, 15(2), 66-75.



A STUDY ON RELATIONSHIPS BETWEEN PRINCIPAL'S
TRANSFORMATIONAL LEADERSHIP AND PHYSICAL EDUCATION
TEACHERS' TEACHING PERFORMANCE
IN TAIPEI ELEMENTARY SCHOOLS

WeiYang Huang, Assistant Professor
Physical Education Department
Taipei Municipal University of Education
Taiwan R.O.C.

ChingLung Hsieh
Chung Chou Institute of Technology
Changhua, Taiwan R.O.C.

Abstract

The study discusses the relationship between principal's transformational leadership and the physical education teachers' teaching performance in Taipei, as changes take the different physical education teachers' background, The study focuses on takes physical education teaching teacher as the sample. In the questionnaire survey were designed by Rossmiller (1992) establish principal's leadership an elementary school scale, and Hallinger (1992) establishes the teachers' teaching performance an elementary school scale. The field of investigation by Taipei 12 administrative areas, each area extracts six schools, each school provides 2 questionnaires, recycles questionnaires total 128 datum. The data and information thus obtained are analyzed with statistical methods such as, mean value, standard deviation, mean value variation test, Pearson correlation, One Way ANOVA, LSD multiple comparison and so on comparison test.

The results divide into two parts of as follows: The first part by background variables of subjects, to principal's transformational Leadership has four variables and physical education teachers' teaching performance with six Variables influence degree. Physical education teacher's marital status have not any influence to each item; The physical education teachers gender's difference, principal's charismatic view is different with the masculine teacher's viewpoint by the feminine physical education teachers to principal. About the teacher teaching self faith, the male and female idea will have the very difference; the physical education teachers' education level difference, a school record higher teacher, effective and diversified teaching skills. Physical education teacher's teaching period of service longer teacher, using to the teaching techniques and the communication skill, the establishment of a harmonious relationship between teachers and students.

The second part of explanation the relationship between principal's transformational leadership four variables and physical education teachers' teaching performance six variables. Principal's transformational leadership model, adopts concepts and so on establishment vision, motivating subordinate, intelligent inspiration, concern subordinate, the physical education teachers' teaching performance has frontage promotion effect. The major findings of the study positive, statistically significant correlations were found between principal's transformational leadership four variables and physical education teachers' teaching performance six variables.

Keywords: Transformational Leadership, Physical Education Teachers' Teaching Effectiveness, Taipei Elementary School Principal

Introduction

From the early 1980's to the early 1990's, leading the trend of research is an extension of effective schools. The leadership of the concept of the play depends on the school effectiveness and teaching effective. This study under the new leadership after the 1980's model to explore the principal's transformational leadership of physical education teacher teaching effectiveness and impact of the relationship.

The Motive And Purpose Of Study

Research Background And Motivation

Students are the main teaching and learning activities, students in the classroom performance will affect the quality of teaching staff, so to enhance the effectiveness of teaching physical education teacher, to promote teaching excellence more delicate quality to achieve the educational goals, this one of the motives behind the study. The principal's transformational leadership model to explore the development of context and influence the motivation level for this study. Principals should be based on the status of the school environment and social change in trends, their own conditions and advantages, to take the best style of leadership and shape the school culture and enhance the effectiveness teaching. (Leithwood, 1992).

Research Purposes

Based on the motive of the study three goals, described as follows:

- (1) Understand the principal's transformational leadership and physical education teachers teaching the relationship between performance.
- (2) Physical education teacher to understand the personal background factors and the relationship between principal's transformational leadership.
- (3) Physical education teacher to understand the personal background factors and the relationship between the effectiveness of teaching physical education .

Literature Review

According to literature (Bryman, 1992): The 1980's as the leading theory of an important breakthrough with the separation. Sims and Lorenzi (1992) and other scholars will be restructuring the leadership of the various research related ways to collectively referred to as "a model for new leadership" (new leadership paradigm), Table 2.1.

Table 2.1 Leadership Theory Stage Of Development

Time	Leadership Theory Development Paths	Research Themes
1900-1945	Traits	Leader of the personality traits
1945-1960	Acts	Exon leaders act
1960-1980	Contingency leadership	Leadership is a combination of factors all valid by the organizations included in the discussions situational factors
After 1980	Transformational Leadership	Stressed the leader of his subordinates or followers of the influence of members to promote self-improvement, organizational commitment, motivation and effectiveness.

Source: Leadership (p.60), by J. Burns, 1978, New York: Harper & Row.

Bandura (1986) pointed out: self efficacy of teachers was a complex multi-concept, may also contain other important dimensions, such as: the impact of the school decision-making, the use of school resources, class teaching, conventional management, and guide parents to

participate in education, to promote community education and create a positive atmosphere of the school and so the effectiveness of faith. Therefore, the study will principal's leadership style are unique, a physical education teacher to establish the concept of self efficacy, the redevelopment in line with the theoretical concepts and local context of measuring tools to research and analysis for the purpose.

Study Design and Implementation

The purpose of this study, Taipei city elementary school principal's transformational leadership and effectiveness teaching and learning physical education teacher association.

Research Structure

Framework of this study is based on the motive and purpose of study, research issues and related literature analysis of the outcome of the proposal to examine the structure, Figure 3.1

Study Object and Sampling Methods

Study Object

This study to Taipei in 2007 as a national primary school teachers for the study of physical education teacher groups, in order to understand between Taipei elementary school principal's transformational leadership with physical education teachers effectiveness teaching relationship.

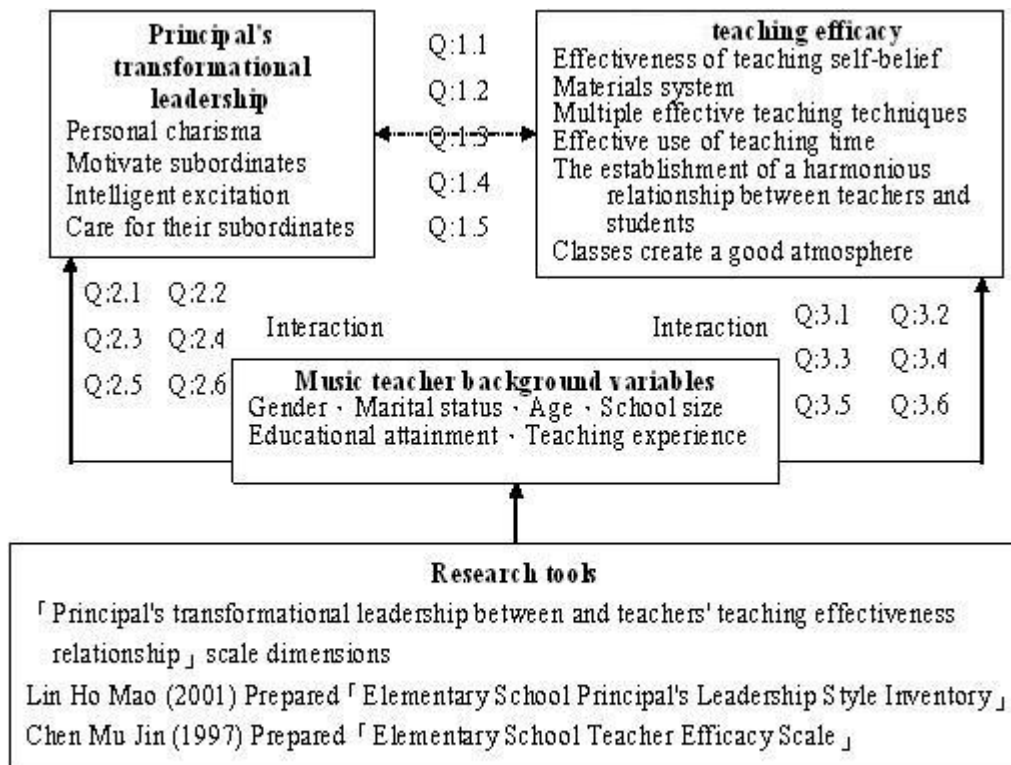


Figure 3.1 Research Organization Chart

Sampling Method

In this study, the sample object to the Taipei city elementary school physical education teaching teachers as sampling, the scope of investigation to the Taipei Administrative Region twelve. Stratified random sampling, each sample Administrative Region six schools, a total of seventy two schools, each school questionnaires two samples.

Questionnaire Recovery

The questionnaires were distributed of 144 samples, 136 samples were recovered, and the recovery was 94.4%, available 128 samples of the questionnaire, available rate of 94.1%.

Research Tools

Based on the combined light of the leadership of the national primary school scale" and "national primary school teachers teaching efficacy scale" and other relevant scale preparation of

the study testing the questionnaire, "principal's transformational leadership and physical education teacher teaching effectiveness study the relationship between the scale".

Data Processing

In this study, experts questionnaire, the questionnaire data using SPSS 15.0 of statistical software packages. Information to mean, standard deviation, the average difference in the test, Pearson correlation method and One Way ANOVA and LSD post statistical methods such as comparative method.

Research Results and Discussion

Analysis of the Questionnaire Items

In this study, a total of 128 valid questionnaires recovered were (Table 4.1: abbreviated). The degree of correlation analysis to understand from table 4.2 of the principal's transformational leadership, the subjects all respondents tend to agree with the option (personal charisma M=3.91; motivate subordinates M=3.95; intelligent excitation M=3.95; care subordinates M=3.99).

Principal's transformational leadership there was no significant between the degree of correlation between the degree of independence and mutual segments respectively, said the four items of principal's transformational leadership, the various representative.

From table 4.3 to understand the effectiveness teaching of the physical education teacher, the subjects all respondents tend to agree with the option (teaching self belief M=3.94; system materials M=3.98; multiple effective teaching M=3.96; effective use of teaching time M=3.89; build a harmonious relationship between teachers with students M=3.78; create a good atmosphere in the class M=3.89). The degrees of effectiveness teaching there was no significant correlation between the various degrees, respectively, between the independent and mutual

segmentation, physical education teachers said the effectiveness teaching have six degrees representative.

Table 4.2 Principal's Transformational Leadership Scale Correlation Analysis

Factors	personal charisma	motivate subordinates	Intelligent excitation	care subordinates
personal charisma	1	.012	.031	.046
motivate subordinates	.012	1	.058	.113*
Intelligent excitation	.031	.058	1	.049
care subordinates	.046	.113*	.049	1

* $p < .05$

Table 4.3 Effectiveness of Teaching And Learning Of Teachers Scale Correlation Analysis Table

Factors	teaching self belief	system materials	multiple teaching	effective use of teaching time	harmonious relationship	atmosphere in the class
teaching self belief	1	.130*	.119*	.047	.010	.100*
system materials	.130*	1	.197*	.063	.004	.036
multiple teaching	.119*	.197*	1	.204*	.116*	.073*
effective use of teaching time	.047	.063	.204*	1	.358*	.188*
harmonious relationship	.010	.004	.116*	.358*	1	.426*
atmosphere in the class	.100*	.036	.073*	.188*	.426*	1

* $p < .05$

Transformational leadership of principals in four degrees (Table 4.4 is abbreviated), to describe the statistical analysis of their data subjects and found that 128 subjects in the personal charisma to inspire their subordinates, intelligent excitation, caring subordinates etc. degrees reaction respondents the average of all tend to "agree" option, and four degrees above the standard deviation (personal charisma SD=.821, motivate subordinates SD=.815, intelligent excitation SD=.761, caring subordinates SD=.728) showed , respondents were no significant differences.

Six degrees of the teaching effectiveness (Table 4.5 is abbreviated), to describe the statistical analysis of their data subjects and found that 128 subjects in the teaching of self belief, the system has teaching materials, pluralism and effective teaching techniques, effective use of teaching time to establish a harmonious relationship, to create a good atmosphere in class teaching degrees reaction, the average of all respondents tend to "agree" option, and four degrees above the standard deviation (teachers teaching self belief $SD=.780$, the system presented materials $SD=.758$, pluralistic and effective teaching techniques $SD=.769$, the effective use of teaching time $SD=.793$, to establish a harmonious relationship between teachers and students $SD=.824$, to create a good atmosphere in class $SD=.761$) showed that subjects have not great difference between the respondents.

*Samples With The Principal Factors Behind The Leadership Of
The Degree Of Correlation Analysis*

This section in order to t test and One Way ANOVA to explore the different statistical sample physical education teacher variables (gender, marital status, age, educational level, teaching experience, school size) on the degree of response differences. To understand the purpose of this study to be answered the questions: Q:1.1, Q:1.2, Q:1.3, Q:1.4, Q:1.5, Q:1.6, Q:2.1, Q:2.2, Q:2.3, Q:2.4, Q:2.5, Q:2.6) data showed.

Gender Differences Physical Education Teachers

T test was found in different genders of physical education teachers on principal's transformational leadership, personal charisma $t=4.34^*$, motivate subordinates $t=3.57^*$, intelligent excitation $t=3.13^*$, caring subordinates $t=3.09^*$ the degrees factors significant differences in each level.

T test found the physical education of different sexes in teaching efficacy scale of degrees, Teaching self belief $t=4.21^*$, a teaching material system $t=3.34^*$, multi-effective

teaching techniques $t=3.72^*$, the establishment of a harmonious relationship $t=4.04^*$, effective use of teaching time $t=3.29^*$, all factors significant differences in each level. Only in the create a good atmosphere in class $t=2.73$, is not gender differences.

Different Marital Status Of The Difference Between Physical Education Teacher

T test found that the marital status of different physical education teachers and principals' transformational leadership, personal charisma $t=.56$, motivate subordinates $t=.84$, intelligent excitation $t=.99$, caring subordinates $t=.84$, None of the factors levels reach significant difference.

T test found that the marital status of different physical education teachers in the teaching efficacy scale of degrees, Teaching self belief $t=.12$, teaching material system $t=.72$, multi-effective teaching techniques $t=1.24$, the establishment of a harmonious relationship between teachers and student $t=.99$, effective use of teaching time $t=.13$, create a good atmosphere in class $t=.18$, level factors were not reach significant difference.

Different Ages Of The Difference Between A Physical Education Teacher

To One Way ANOVA analysis and found that different age groups of physical education teachers and the principal's transformational leadership scale, motivate subordinates $F=2.99^*$, intelligent excitation $F=2.46^*$, care for their subordinates $F=2.38^*$, degrees of each significant differences; personal charisma $F=1.51$, factor of degree level not significantly different.

To One Way ANOVA analysis and found that different age groups of physical education teachers in teaching efficacy scale response, system showed materials $F=2.59^*$, multi-effective teaching techniques $F=2.28^*$, building a harmonious teacher student relationship $F=3.53^*$, reached a significant degree of difference; teaching self belief $F=1.36$, effective use of teaching time $F=1.14$, create a good atmosphere in the class $F=1.52$, factor of degree level, no significant

differences, which found that: physical education teacher degree of self belief of respondents tend to "consent", that teaching self belief, not because of different ages, and there are differences, all tend to have a high degree of self belief.

*Different Educational Levels Of The Difference Between A
Physical Education Teacher*

To One Way ANOVA method, different levels of education found that physical education teachers and the principal's transformational leadership scale, motivate subordinates $F=2.63^*$, intelligent excitation $F=3.13^*$, care for their subordinates $F=2.82^*$, of degrees are Tatsu significant differences; personal charisma $F=1.54$, factor of degree level, no significant differences found: different levels of education of physical education teachers on principals leadership "charisma" is consistent. In addition, the physical education teacher for higher principal's "intelligent excitation" leadership, a high degree of recognition.

To One Way ANOVA method, different levels of education found that physical education teachers teaching efficacy scale response, teaching self belief $F=2.71^*$, a teaching material system $F=2.49^*$, multi-effective teaching techniques $F=3.64^*$, effective use of teaching time $F=2.53^*$, reached a significant degree of difference; its discovery: the higher education of physical education teachers" teaching self belief " and "system has teaching materials" are higher.

Different Teaching Experience Of The Physical Education Teacher Differences

To One Way ANOVA method, found that different teaching physical education teachers and the principal's transformational leadership scale, intelligent excitation $F=2.48^*$, significant degree of difference; personal charisma $F=1.34$, motivate subordinates $F=1.91$, care for their subordinates $F=1.76$, factor of degree level not significantly different.

To One Way ANOVA method, found that different teaching physical education teachers, effective use of teaching time $F=2.76^*$, building a harmonious relationship between teachers and students $F=3.53^*$, create a good atmosphere in the class $F=2.85^*$, degree reached the significant differences; teaching self belief $F=1.51$, teaching material system $F=2.01$, multi effective teaching techniques $F=1.51$, no significant difference of degree, and its discovery: more than 21 years teaching experience physical education teachers can best grasp the teaching time. With the length of teaching, the importance to the harmonious relationship between teachers and students.

From Different Schools To The Size Of The Difference Between A Physical Education Teacher

To One Way ANOVA method, found that "intelligent excitation", "motivate subordinates", "charismatic", "caring subordinates" items were not significantly different degrees, and its discovery: not because of the size of school classes, for principal's transformational leadership and a high degree of consensus views.

To One Way ANOVA analysis and found that the size of different schools in the multiple and effective teaching techniques $F=3.15^*$, the remaining five degrees above the average of all tend to "consent", said the number of school classes the size of the five items in this degree there was no significant difference in performance.

The Degree of One Way ANOVA

In this study, questionnaires were in understanding the basic information with the principal's transformational leadership total score of One Way ANOVA, as shown in table 4.18 ANOVA results showed that subjects background, gender and marriage on the principal's transformational leadership are significantly different.

In this study, questionnaires were in understanding the basic information and physical education teachers teaching efficacy scale scores of One Way ANOVA, as shown in table 4.19

ANOVA results showed that subjects in terms of gender differences in the effectiveness of teaching and physical education teachers are significantly different, its $F=12.78^*$; subjects in the different marriage and physical

Table 4.18 Samples Of Basic Information With The Principal's Transformational Leadership Total Score Of One Way ANOVA

Gender S.V	SS	df	MS	F
Between subjects SSb	2.153	1	2.153	3.39*
Within subjects SSw	80.645	127	.635	
total SSt	82.798	128		
Marriage S.V	SS	df	MS	F
Between subjects SSb	1.449	1	1.449	2.26*
Within subjects SSw	81.407	127	.641	
total SSt	82.856	128		
Age S.V	SS	df	MS	F
Between subjects SSb	2.236	4	.559	.91
Within subjects SSw	80.476	124	.649	
total SSt	82.712	128		
Educational attainment S.V	SS	df	MS	F
Between subjects SSb	1.674	3	.558	.86
Within subjects SSw	81.125	125	.649	
total SSt	82.799	128		
Teaching experience S.V	SS	df	MS	F
Between subjects SSb	2.469	3	.823	1.28
Within subjects SSw	80.375	125	.643	
total SSt	82.844	128		
School size S.V	SS	df	MS	F
Between subjects SSb	2.016	3	.672	1.04
Within subjects SSw	80.75	125	.646	
total SSt	82.766	128		

$*p < .05$

education teacher effectiveness of teaching and learning, no significant differences; subjects of different ages and physical education teachers have a significant difference in the effectiveness of teaching, and its $F=2.85^*$; subjects high and low level of education and physical education

teachers have a significant difference in the effectiveness of teaching, and its $F=3.41^*$; the teaching subjects of different length of the effectiveness of teaching and physical education teachers are significantly different, the $F=3.27^*$; subjects where the schools of different size the teaching effectiveness and physical education teachers, are not equipped with significant differences.

In order to understand the transformation of presidential leadership in physical education teaching efficacy response situations, the study principal's transformational leadership is divided into four degrees of effectiveness teaching and teachers of six degrees, in various degrees of differences in surface structure, in order to duplicate the volume of the number of One Way ANOVA Analysis carried out tests of various factors determine whether there are significant differences. 4.20 shown by the table that the degree of checking and testing by the $F=48.37^*$, reaching significant differences.

Comparative method afterwards by LSD found (Table 4.21 abbreviated), principal's transformational leadership and physical education teacher of the degree of effectiveness teaching, the degree of the questionnaire items were "personal charisma" , "motivate their subordinates", "intelligent excitation", " caring subordinates" four of degrees; physical education teacher effectiveness teaching "teaching self belief", "teaching material system", "Multi-effective teaching techniques", " effective use of teaching time" and "build a harmonious relationship between teachers and students",

Table 4.19 Basic Information And Physical Education Samples Teaching Efficacy Scale Total Score Of One Way ANOVA

Gender S.V	SS	df	MS	F
Between subjects SSb	.739	1	.739	12.78*
Within subjects SSw	66.675	127	.525	
total SSt	67.414	128		

Marriage S.V	SS	df	MS	F
Between subjects SSb	.492	1	.492	1.09
Within subjects SSw	66.929	127	.527	
total SSt	67.421	128		
Age S.V	SS	df	MS	F
Between subjects SSb	1.844	4	.461	2.85*
Within subjects SSw	65.596	124	.529	
total SSt	67.44	128		
Educational attainment S.V	SS	df	MS	F
Between subjects SSb	3.765	3	1.255	3.41*
Within subjects SSw	63.625	125	.509	
total SSt	67.39	128		
Teaching experience S.V	SS	df	MS	F
Between subjects SSb	1.707	3	.569	3.27*
Within subjects SSw	65.75	125	.526	
total SSt	67.457	128		
School size S.V	SS	df	MS	F
Between subjects SSb	.642	3	.214	1.38
Within subjects SSw	66.875	125	.535	
total SSt	67.517	128		

* $p < .05$

Table 4.20 Principal's Transformational Leadership And Effectiveness Of Teaching and learning of physical education teacher paired ANOVA Summary

Variation source S.V	SS	df	MS	F
Between subjects SSb	43.36	127		
Within subjects SSw	260.65	1152		
Factor of degree	52.42	9	8.74	48.37*
Residuals	208.23	1143	.1807	
total SSt	304.00	1279		

* $p < .05$

"create a good atmosphere in class "item degrees. The degree of respondents found the results of comparison between the degrees are significantly different.

Conclusions and Recommendations

Conclusions

This section is divided into two parts to explore; the first part of "principal's trans

formational leadership four variables" and "physical education teacher effectiveness teaching of six variables," the degree of mutual influence. The second part of "principal's transformational leadership variables" to "physical education teacher teaching effectiveness" relevance.

Principal's transformational leadership to teaching effectiveness for the physical education teacher's overall performance has a positive effect. Among them, most certainly care subordinates, followed by intelligent excitation and inspire their subordinates and personal charm.

Female teachers, higher education, age and a longer length of the physical education teacher more attention to the way the leadership of principals. One in four of female teachers are obviously have a high degree of correlation; attention to older persons caring principal subordinates; with Dr. with a master's degree teachers attach more importance to inspire and motivate their subordinates intelligent; different years of the principal leaders of the teachers have different expectations. As regards the difference in school size and marital status of the teachers there is no significant difference.

Different personal background physical education teachers, in the teaching effectiveness have differences, but all agree that teachers should possess a high level of teaching effectiveness. One female teachers to attach greater importance to create a good atmosphere in class; teachers according to age level is high or low self belief in teaching have a high degree of identity; the higher qualifications of teachers, the more proper and effective use of multiple teaching and learning technologies; higher seniority teachers, more able to grasp the effective use of teaching time; another larger school, peer interaction with one another and learning, to enhance the effectiveness of teaching physical education teachers.

Recommendations

Taipei Elementary Principal Recommendations

Principals should be to motivate subordinates and care for the leadership of his subordinates, as are consistent with the current leadership of humane management trends, principals should be attached great importance to communication, coordination, participation, motivation, innovation leadership.

Taipei Elementary Physical Education Teacher's Recommendation

Since the 90's, Europe and the United States for teachers teaching effectiveness studies. According to this study pointed out that Taipei can be a physical education teacher in "Teacher's teaching self belief", "system, the contents of a textbook", "Multi-effective teaching techniques", "effective use of teaching time" and "build a harmonious relationship between teachers and students", "create a good class atmosphere", the six items, the physical education teacher as the basis for the effectiveness of teaching.

Researchers On The FollowUp Recommendations

In class a few more school teachers, peers with more agitation, teachers can effectively use diverse teaching skills; and a few more classes in schools, teachers groups to become more competitive, however, on "classes the size of a physical education teacher competitiveness" to be follow-up study.

References

- Bandura, A. (1986). *Social Foundations of Thought and Action: A social cognitive theory*. Prentice Hall, Englewood Cliffs, New Jersey.
- Bryman, A., (1992). *Charisma and leadership in organizations*. Newbury Park, CA: Sage.
- Burns, J. (1978). *Leadership*. New York: Harper & Row.

- Hallinger P. (1992). The evolving role of American principals: From managerial to instructional to transformational leaders, *Journal of Educational Administration*, 30(3), 3548.
- Leithwood, K. (1992). The move toward transformational leadership. *Educational Leadership*, 49(5), 812.
- Rossmiller, R. A. (1992). The secondary school principal and teachers' quality of work life. *Educational Management and Administration*, 20(3), 132146.
- Sims, H. P., Jr. & Lorenzi, P. (1992). *The new leadership paradigm*. Newbury Park, CA: Sage.

DISASTER AND RISK MANAGEMENT IN A GLOBAL WORLD

Dr. Pranee Chitakornkijasil
Graduate School of Business Administration
National Institute of Development Administration (NIDA), Thailand
wayne.s@nida.ac.th

Abstract

In this study, disasters and crisis factors are identified. Then, we address various international risks. This is followed by an inspection of risk management perspective in a global context. Emerging international risks are discussed. In addition, we illustrate domestic crisis management as an augmented international activity. Crisis management from afar is also discussed. Moreover, we consider international crises and their role in potential domestic threats. Finally, the risk of global sourcing is studied.

Key Words: Disaster and Risk Management, Global World

Disaster and Risk Management in a Global World

- Disasters and crises flash up throughout the world with various degrees of duration and intensity.
- Domestic crisis management activities are constrained by international institutions, actors, and various other interests.
- Emerging risks are difficult to locate but may potentially have a great impact.
- Changes in environment, demography, socio-economic structure, and technology have had a crucial impact on the nature of emerging risks.
- Events that happen in the future almost often have their roots in the past.
- Although various threats are common across the globe, the specific types of threats vary, as do the attitudes and approaches to their management and prevention.

Various International Risks

- Country-specific risks are threats that stem from the economic, political, social, environmental, cultural, and other variables within each country.
- Emerging risk is a potential new threat that can result as critical consequences.
- Assess the risk to country 'A' to see if its' local sector may be incubating similar conditions to those which led to a crisis in country "B".
- The risk that a disaster in country 'A' will pose a threat to country "B" by crossing national borders.
- Remote crisis management authorities whose task it is to manage a crisis from afar when its citizens are captured in conflict and disaster in another country.

Risk Management Perspective in a Global Context

The process of identifying, treating, and evaluating risk can be applied to enhance the success of new projects, assist organizations in accomplishing their objectives, and to ensure continued service should a crisis occur. It is a process that is influenced by the specific cultural, political, economic, and social circumstances of the country. Although many threats faced by the public sector are common, for example, IT failures, climate-related difficulties, terrorism, safety and health issues, etc., the specific types of threat change from country to country. Geographical location can determine whether loss or damage from tornadoes, hurricanes, drought, flood, forest fires, or tsunami is likely. Cultural and ethical factors can influence the nature and the application of bribes necessary in some countries in order to obtain services or gain certain permissions from the public sector. The political and economic situation may encourage theft for political and financial gain by disaffected groups, which poses a particularly higher risk for employees working overseas. Religious and political problems may cause war, terrorist activity, and general unrest. The way in which public institutions and members of the public react to threats is influenced by a range of factors, such as the social, economic, religious, political and cultural dimensions of the country in which they live or work. Individuals may leave their homes, for example, or they may believe that their god will protect them from illness or injury. Still other people may wait on others to help them. Therefore, for internationally concentrated organizations which have a stated intent to help people who may be suffering the effects of death, war, and other adversities, management of risk takes on new dimensions. Government departments play a vital role in providing information and advice on problems relating to the risks of being in another country: Therefore, governments must consider when to take measures, such as:

- When to oppose all but essential travel in areas of much greater risk, which ought to take place only if absolutely necessary.
- When to object to all travel to these countries under any circumstances.
- When to oppose all travel to parts of certain areas that warrant a visit.

Faced with warnings about other threats and terrorists, most individuals heed the advice to stay at home. From a risk point of view, the better the information, the better the evaluation of both the threats and opportunities. This can lead to the development of strategies and policies that deal with the specific risk presented. Staff may need specialized training in personal security, including, for example, defensive driving techniques that could enable them to escape a potentially risky situation.

Emerging International Risk

The nature of risk is always changing. Emerging risks are phenomena whose effects and nature cannot even be guessed at in term of loss within a specified time period. And emerging risks have significant impacts. Five large and serious threats have been identified: technological accidents, natural disasters, terrorism-related risk, food safety, and infectious diseases. The OECD proposes four critical contexts that are related to management of emerging risks:

- a. demography
- b. environment
- c. technology
- d. socio-economics structures.

Demography

Nowadays, the world is undergoing major demographic changes. In developed countries, the average birth rates are falling and the number of elderly people is increasing as a

percentage of the total population. This has put pressure on governments to extend the age at which state pensions become payable and to prevent employers from discriminating against older workers who wish to continue being employed. In some developing nations in Africa and Asia, the situation is different: The application of better medical and health care has led to improved child survival rates and an increase in youth populations.

Environment

As economies grow, global climate changes increase the depletion of the ozone layer and carbon dioxide emissions. While some nations (such as certain parts of Europe and Asia as well as the United States) are experiencing more numerous and more devastating floods and storms, others are growing in concern over drought, forest fires, and failed crops. Governments are required to address the increased likelihood that their agencies shall be called upon to give emergency assistance when weather-related disasters strike. In the short-term, more legislation ought to be passed to force domestic users and businesses to reduce their energy consumption and minimize waste. Moreover, another area of environmental concern relates to fresh water. The suppliers of fresh water are unable to provide the demand for a resource that is becoming increasingly scarce. With present consumption patterns, it is forecasted that two-thirds of the world's population shall live in water shortage conditions by 2025. Poor and absent water supplies shall lead to further spread of disease and ill-health in affected communities. Australia, Spain, and parts of the United Kingdom are examples of nations already having to impose restrictions on the use of water by their citizens.

Technology

New technology creates vast benefits in education, health, and global communication. However, these benefits also lead to prospective new threats. The first one is in connection,

which facilitates information processing and gathering, but creates multiple channels through which negative consequence can easily spread. The increasing pressure to deliver more efficient public services and improve the relationship between governments and their citizens through the application of information and communication technology has led to the growth of e-government. Paper based files and forms are being replaced by online services. The host of deliberately created, destructive computer viruses that cause systems to crash around the globe are examples of both the weakness and the power of the interconnectivity of the global-wide web. Another aspect of new technology worth considering is the rapidity and pervasiveness of technological change and development. Take e-government for example, which has led to the installation of public Internet access points in municipalities and communities in order to make it easier for citizens to access services. However, this situation does not take into consideration the possibility that individuals, especially the elderly and disabled, do not have skills or adaptations available to allow them to access these facilities. Risk management must address the changing threats that this presents.

Socio-economic Structures

Privatization and regulatory reforms reduce government's role in managing the economy, although its influence might still be considerable. Conflicts of interest may arise in trying to manage risk. As an example, debates about expanding nuclear power production capabilities are influenced by governments which need to guarantee vital infrastructures are maintained, NGOs who seek to protect the environment, and corporations who gain from the operational phases and the construction of such ventures. This situation brings up questions about how to balance one risk against another and where, eventually, the decision on risk-taking must lie. Globalization, instead of supplying benefit to all, appears to create a gap between the

'have-nots' and the 'haves', which augments poverty and leads to unrest and social tension in some nations. Although we do not know the consequences in advance, we can predict many of the surprises that lay ahead in the future because they will be intricately linked to what is happening today. Forces that are predicted to pose risks in the future include tension between the environment and economic growth, and economic disruption caused by regional and global cooperation. Uncertainty in the environment may come from globalization, resource pressures, and climate change.

Domestic Crisis Management as Augmenting International Activities

We are able to identify three critical reasons why local crisis management activities may become bound by an array of international actors, interests, and organizations. Firstly, some disasters or crises are simply too big, unmanageable, complex, and incomprehensible to handle alone. Countries under these circumstances always find that they need technical assistance, equipment, specialist expertise, personnel, and other forms of direct aid. Political crisis decision-makers are, at times, reluctant to accept support. Obtaining outside help can create some kind of long-term dependence or a debt owed. Secondly, some disasters or crises need varying degrees of entrenched international involvement through legal requirements and established conventions. In many aspects of crisis management, member nations are bound by legal obligations, such as decisions and directives covering various aspects of response and report in relation to chemical accidents, marine pollution, infectious diseases, and other critical episodes. Various conventions may exist that play a role in crisis management, particularly through mutual support networks, with some being more formal than others. For example, the European Union has many support systems for the controlling and surveillance of risks, dissemination of rapid alerts, and for the coordination of information, resources, and expertise. Thirdly, disaster management and local

crises centers are often subject to strong international political pressures to shape the response and create significant interventions. For example, domestic crisis and threats can generate an international movement to avoid or boycott a particular service or location, or even country. These three factors point out that the character of local crisis management activities is changing incrementally. Broadly consistent with wider trends towards an increasingly globalized world shaped by interests, actors, and power of cross-national institutions, purely local crisis management can be uncertain. Indeed, as countries draw on international assistance and are constrained by international agreements to manage the response, planning, and recovery phases of hurricanes, typhoons, terrorist attacks, tsunamis, and more, we are able to sense a developing homogenization of local crisis response. In a world of rapid transport networks and rapid communications, international interventions are, in fact, much more practical. The interplay of international forces with domestic policies, budgets, institutions, leaders, agendas, and more will inevitably create nation and sector specific crisis responses. Decentralization and the exercise of local autonomy to fit local circumstances is a highly critical factor in an effective crisis response. Local crisis management is tilting towards international crisis management.

Crisis Management from Afar

A crisis management activity arises in situations when public authorities in one nation need to intervene to rescue or protect their citizens who are caught up in an overseas crisis or disaster. Governments need to respond in order to rescue and locate their citizens. Crisis management episodes are difficult challenges for political and official elites alike. Citizen expectations and the media's demand that leaders know what is going on are joined with expectations that government action should be swift and effective. Otherwise, the nation or region affected by a particular crisis is liable to fall into turmoil, perhaps even resulting in long-term conflict. In such

situations, and from the perspective of outside nations, existing communication channels through foreign embassies, local offices, and diplomatic postings can seem to be broken. As for political elites, crisis management challenges are of the symbolic variety. Acceptance of responsibility to delay action might be the dignified thing to do, and can, in fact, diffuse criticism. Moreover, virtually every international, high profile disaster or crisis generates swift hindsight rationalizing and speculation from the citizens, experts, and particularly the media. In fact, a bad event can lead to suggestions of a larger accident waiting to happen, or an inevitable crisis or disaster in the making. Disasters and crises urge a prompt combination of decentralized and centralized responses. Domestic officials and operators deal primarily with operational matters while elites are involved in operational matters, for example, in approving aid and granting authority for others to act. Managing crises from afar extends the relationship between decentralized and centralized entities and poses an essential challenge for decision-makers. Not only is there critical geographical space between both, but one must also consider that domestic operational matters need to be conducted in another country utilizing its own institutions, elected government, laws, cultures, sovereign powers, and media, which are liable to be in a state of flux. Crisis management from afar comes with high expectations, and may rely on exceptional logistics.

International Crisis and Potential Domestic Threats

Public authorities operate in a world in which crises and disasters flash up with uncertain duration and varying degrees of intensity throughout the globe. Crisis can be consensus-based because they are unintentionally created from the routine operations of society and from forces of nature: avian flu, floods, mouth and foot disease, oil spills, and chemical explosions, for example. Or they can be ‘conflict-based’, which are deliberate crisis, for example, chemical

pollutants, terrorist attacks involving bombs, agitator attempts to destabilize regimes, or direct military challenges. In this context, there are two broad issues which public authorities in non-affected countries not experiencing an acute crisis need to find out.

The Threat of Risk Overflow in the Local Arena

Public authorities already hire professionals whose job it is to cope with disaster-related tasks such as emergency planning, risk management, and others. However, it is likely that other components within organizations, for example, organizational culture, individual awareness, crisis infrastructure, top management thinking, and planning also play some part in an organization's ability to critically treat threats. Within this capacity, officials review the nature of a manifesting threat on distant shores, estimate the likelihood that the threat will cross national borders and hit domestically, and evaluate the likely damage that would occur were such an event to materialize. Principally, if the risk is looked upon as low, existing local procedures would be able to deal with the threat. Risk managers, crisis planners, and others are required to carefully evaluate threats, adapt existing plans, and develop additional plans to be integrated into present arrangements. Some international collaborative work might be needed to help contain the threat. If the risk is high, local procedures are likely to break down.

International cooperation with the UN, governments, NGOs and others is needed to support preventative measures in the country experiencing the crisis. Evaluating the impact of overflow risk may be fraught with difficulties. There are simply too many disasters and crises world-wide to engage in a dynamic appraisal for everyone. Indeed, many shall never cross officials' radar. Instead, their existence will be confined to distant networks of politician, officials, NGOs, media, and private citizens. Local political institutions do not have the resources for controlling all external disasters and crises. Leadership strategies, personalities, institutional

agendas, dominant ideologies, inherited programs, timing, historical experiences, and more can all filter out from, or amplify, any evaluation.

The Local Threat

Episodic problems, for example, food safety episodes or water contamination incidents, refer to local circumstances that are unlikely to replicate similar conditions at another time and location. Nonetheless, minor information seeking and double checking may be required from all relevant organizations. Sometimes, problems are indicative of local circumstances that are likely to harbor similar propensities for failure with their international counterparts. Also, it is necessary to guarantee that vulnerabilities and risks are re-evaluated, and that remedial action is taken. This may involve learning how the affected country has coped with the threat. Various governments are quick to evaluate local networks and the risks involved with key media figures, thinking through the implications of reprinting. Eventually, some problems are rated high in risk, and carry extreme threats. Strategic threats are required to be urgently evaluated, with swift and directive top down action, guaranteeing that relevant organizations agree with appropriate prevention, risk reduction, and containment measures. In the same vein, making judgments on local incubating factors is subject to considerable constraints. Various problems are never considered simply because of the sheer volume of crisis and disasters throughout the world. In a world of increasingly internationalized interactions due to many factors such as politics, economics, population density, technology, and others, a crisis in one country may at times be inadvertently signaled as a threat across global communities. Their complex interactions with national institutions, programs, policies, actors, and networks have the capacity to reshape local relationships within and between policy sectors. The effect can strike at the heart of networks,

policies, and relationships. Ultimately, local adaptive response teams could emulate, copy, and be inspired by the policy experiences of other countries.

Other Countries Response to Crisis

From another angle, a global dimension of crisis management might mean a situation where public institutions in one country always offer crisis assistance to another. Many developed nations have specific agencies or offices to cope with overseas humanitarian issues and offer assistance in times of disaster. Generally, various nations may support the disaster and crisis responses of others for genuine humanitarian reasons, but there may be other motives, as well. A donor country may have good economics and good politics, which can help to promote stability in the surrounding region. Therefore, the region could be of strategic interest which could lead to economic benefits through contracts for reconstruction and long-term trade agreements. Additionally, the donor country may have special interests that it seeks to protect.

Risk of Global Sourcing

Manufacturing offshore is risky. Manufacturing capacity can be made more competitive, but the hidden costs of inventory holding, obsolescence, and demand unresponsiveness are risks that counter the headline benefits. Global sourcing may have the following risks:

- The long-term impact on demand and supply is less clear and may distort markets both in terms of the risks of secure supply and the benefits gained.
- The extended chain is not able to be as responsive to variations in demand as domestic sourcing; therefore, there may be opportunity costs of lost sales.
- There could be risks with execution and quality due to the long distance relationships and the various hand-offs in processes to move product to its destination, where inaccuracies can cause service failures.

- Valuable know-how may be given away to selling, allowing others to enter markets and for engineering skills and products to be lost.
- There are risks that the total acquisition cost could be greater than the anticipated net benefits that the initial purchase cost implies. When all elements are considered, i.e., handling, transportation, obsolescence, duty, lost sales, inventory, and market blocking, the total cost may not be as attractive as the initial advantage.

International sourcing is not a consistent proxy for sustained higher profits. The volatilities of consumer demand, business climate, fashion, competitive actions, quality of execution, and market dynamics all combine to make the outcome less certain. External risks to the corporation can be described as follows:

- Environmental risk concerns the risk associated with external and, from the company's perspective, uncontrollable events. The risks can impact the company directly or through consumers and suppliers.
- Demand risk concerns actual potential disturbances in flow of product, cash, and information, emanating from within the network or between the local company and its market.
- Supply risk deals with the upstream equivalent of demand risk; it concerns actual or potential disturbances to the flow of product or information emanating within the network.

Internal risks to the corporation concern both how the company addresses external risks and its competences in planning and executing its own company policies and procedures, as follows:

- Monitoring the assumptions, systems, rules, and procedures that govern how an organization exerts itself over processes and safety policies, as well as how it monitors asset and transportation management. Controlled risk is the risk coming from either the misapplication or the application of these rules.
- Risk processes are the sequences of managerial activities and value-adding activities undertaken by a company. The execution of these processes is immediately dependent on managed assets (or internally owned assets) and on a functioning infrastructure. Process risk means any disruption to these processes.

It is clear that supply from global sourcing has the potential to increase risk.

Conclusions

Global changes can make domestic impacts and can affect both the demand for, and the types of services offered by public sector organizations. Various disasters and crises need varying degrees of international cooperation. Risk and crises often do not simply occur within national boundaries but can spill over borders, affecting numerous nations at the same time. The need to interact with institutions and agencies in other nations, and to share information, is obviously vital if future crises and threats are to be effectively managed. This study has offered suggestions on how to assist other nations in their management of disasters and crises. In addition, the possibilities of threats crossing borders into local arenas have been discussed. Moreover, the critical reasons why managing domestic disasters and crises is important have been made apparent. Furthermore, the need for an understanding of the nature and contexts of emerging international risks has been described. Finally, crucial factors influencing the perception of international threats were discussed. In this study, we propose some suggestions on how to reduce risk. There are various management control techniques to reduce risk, such as:

total quality management (TQM), Just-in-time management, supply chain management, benchmarking, reengineering, balance score card, and logistic, to name a few. These techniques are most useful for monitoring activities from suppliers to consumers, and measuring return benefits to the company.

References

Allen, Harris; Bunn, William., "How Risky Is Overtime, Really?" *Harvard Business Review*, May 2007, Vol. 85 Issue 5, p26-26, 1p.

Apgar, David., *Risk Intelligence: Learning to Manage What we don't know*, Boston, Mass.: Harvard Business School Press, 2006.

Berniker, Eli., "The Company Doctor: Risk, Responsibilities, and Corporate Professionalism" (Book). *Administrative Science Quarterly*, Jun2003, Vol.48 Issue 2, p311-314, 4p.

Bothner, Matthew S.; Jeong-han Kang; Stuart, Toby E., "Competitive Crowding and Risk Taking in a Tournament: Evidence from NASCAR Racing," *Administrative Science Quarterly*, Jun 2007, Vol. 52 Issue 2, p208-247, 40p.

Bremmer, Ian. "Managing Risk in an Unstable World." *Harvard Business Review*, June 2005, Vol. 83 Issue 6, p51-60, 8p.

Burgman, Marl A., *Risks and Decisions for Conservation and Environmental Management*, Cambridge, UK; New York: Cambridge University Press, 2005.

Chance, Don M., Brooks, Robert, *An Introduction to Derivatives and Risk Management*, 7th ed., Australia: Thomson/South-Western, 2008.

Chapman, Robert J., *Simple Tools and Techniques of Enterprise Risk Management*, Chichester, West Sussex, England; Hoboken, NJ: J. Wiley & Sons, 2006.

Chavas, Jean-Paul., *Risk Analysis in Theory and Practice*, Amsterdam; Boston: Elsevier Butterworth-Heinemann, 2004.

Condamin, Laurent., Louisot, Jean-Paul., Naim, Patrick., *Risk Quantification: Management, Diagnosis and Hedging*, Chichester, West Sussex, England; Hoboken, NJ: John Wiley, 2006.

- Cooper, Cary L. (Cary Lynn), Clarke, Sharon, *Managing the Risk of Workplace stress*, New York: Routledge, 2004.
- Dallas, George S., *Governance and Risk : an Analytical Handbook for Investors, Managers, Directors, and Stakeholders*, New York: McGraw-Hill, 2004.
- Drennan, Lynn T., McConnell, Allan, *Risk and Crisis Management in the Public Sector*, New York, NY: Routledge, 2007.
- Eccles, Robert G.; Newquist, Scott C.; Schatz, Roland; "REPUTATION and its Risk." *Harvard Business Review*, Feb 2007, Vol. 85 Issue 2, p104-114, 11p.
- Herman, Melanie L., *Managing Risk in Nonprofit Organizations: a Comprehensive Guide*, Hoboken, N.J.: Wiley, 2004.
- Jorion, Philippe, 1955, Global Association of Risk Professionals., *Financial risk manager handbook*, 4th ed., Hoboken, N.J.: Wiley & Sons, 2007.
- Koller, Glenn R. (Glenn Robert), *Assessment and Decision Making in Business and Industry: a Practical Guide*, 2nd ed., Boca Raton, FL: Chapman & Hall/CRC, 2005.
- La Porte, Todd R., "Shouldering Risks: The Culture of Control in the Nuclear Power Industry." *Administrative Science Quarterly*, Mar 2006, Vol 51 Issue 1, p155-159, 5p.
- Loader, David., *Operations Risk: Managing a Key Component of Operations Risk Under Basel II*, 1st ed., Oxford: Burlington, MA: Butterworth-Heinemann, 2007.
- McCarthy, Mary Pat., Flynn, Timothy P., Brownstein, Rob., *Risk From the CEO and Board Perspective*, New York: McGraw-Hill, 2004.
- McDaniels, Timothy, Small, Mitchell J., *Risk Analysis and Society: an Interdisciplinary Characterization of the Field*, Cambridge; New York : Cambridge University Press, 2004.
- Morse, Gardiner., "Innovate at Your Own Risk.", *Harvard Business Review*, May 2005, Vol. 83 Issue 5, p25-25, 1p.
- Mun, Jonathan., *Applied Risk Analysis: Moving Beyond Uncertainty in Business*, Hoboken, N.J.: Wiley, c 2004.
- Nohria, Nitin; Stewart, Thomas A., "Risk, Uncertainty, and Doubt," *Harvard Business Review*, Feb 2006, Vol. 84 Issue 2, p39-40, 2p.
- Ouchi, Fumika, Would Bank., *A Literature Review on the Use of Expert Opinion in Probabilistic Risk Analysis*, Washington, D.C.: World Bank, 2004.
- Perrow, Charles, "Organizational Encounters with Risk," *Administrative Science Quarterly*, Sep 2006, Vol. 51 Issue 3, p517-521, 5p.

Rejda, George E., *Principles of Risk Management and Insurance*, 9th ed., Boston: Addison-Wesley, c2005.

Reuvid, Jonathan., *Managing Business Risk*, 3rd ed., London; Philadelphia: Kogan Page, 2006.

Reuvid, Jonathan., Institute of Risk Management, *Managing Business Risk: a Practical Guide to Protecting your Business.*, 4th ed., London; Philadelphia: Kogan Page, 2007.

Sine, Wesley D.; Haveman, Heather A.; Tolbert, Pamela S., "Risky Business? Entrepreneurship in the New Independent-Power Sector," *Administrative Science Quarterly*, June 2005, Vol. 50 Issue 2, p200-232, 33p.

Singpurwalla, Nozer D., *Reliability and Risk: a Bayesian Perspective*, New York: J. Wiley & Sons, 2006.

Todinov, M.T., *Reliability and Risk Models: Setting Reliability Requirements*, Chichester, West Sussex; Hoboken, NJ: Wiley, 2005.

United Nations Development Programme. Bureau for Crisis Prevention and Recovery., *Reducing Disaster Risk: a Challenge for Development.*, New York: United Nations Development Programme, Bureau for Crisis Prevention and Recovery, 2004.

A STUDY OF THE DIFFERENCES IN IMAGE MEMORY AND PREFERENCE BETWEEN MALE AND FEMALE VISUAL COGNITION

Shou-Fang Liu

Department of Industrial Design, National Cheng Kung University
liusf@mail.ncku.edu.tw

An-Sheng Lee

Department of Forest Products Science and Furniture Engineering, National Chiayi University
sheng1887@mail.ncyu.edu.tw

Jenn-Yang Lin

Department of Applied Arts and Design, NanHua University
design@mail.nhu.edu.tw

Yo-Wen Liang

Department of Industrial Design, National Cheng Kung University
E-mail: 7654311@yahoo.com.tw

Wen-Ching Su

Department of Forest Products Science and Furniture Engineering, National Chiayi University
wencsu@mail.ncyu.edu.tw

Abstract

Cognition is a critical process for human beings to obtain messages, process messages, and eventually acquire information, in which vision is the most important since it accounts for 65%-70% of the absorbed knowledge and information. Currently, information is so complicated that image messages are full of daily life and thus become interference. The study aimed to understand the difference in visual cognition of images between different genders and investigate three issues, namely (1) the difference between the memory quantities of images, (2) the difference between the better remembered categories of images, and (3) the difference between the more impressive images, in the visual cognitive process of simultaneously watching different categories of images. The study targeted at the general public from 18 to 40 years old, including respectively 30 males and 30 females. The study classified images into five categories: Animal, Plant, Human Figure, Cartoon Character, and Culture and Life. Each category included ten representative images, and these fifty images were played by the speed of one image per second. An entirely black image was played for five seconds respectively before and after the fifty images were played. Therefore, it took one minute in total, and each research object answered the questionnaire after all the images were played.

According to the research result, there was not significant difference between the memory quantities of males and females between 18 and 40 years old ($p=0.738>0.05$). Males remembered best human figures (52%) whereas females remembered best human figures (56%) and second best cartoon characters (46%). In summary, the memory for the images of human figures tended to be more visual cognitive. However, in terms of the preference for images, cartoon characters received the most votes while human figures received the second most votes. In light of the result, suggestions for the application and cognition of images were brought up in order to improve the application of images as well as to be the cognitive theory of images in the following research.

Keywords: Cognition, Vision, Image, Memory

Introduction

Cognition indicates the systematic behavior that human beings process messages after sensing external information, and from which they obtain or learn meaningful knowledge and experience. The progress is composed of receptor, reactor, cognitive processor, and memory (Lin, 2007). Human bodies sense external messages through sense organs, and, by message processing, they generate feelings, including five important feelings, namely vision, hearing, olfaction, taste, and touch.

Vision is one of the crucial senses of human beings. 65%-70% of the knowledge and information of ordinary people are obtained through vision (Chen & Yang, 1998). When looking at images, human beings will also unconsciously focus on a particular subject and remember it. For example, people tend to have different focuses when they look at the same picture with various images, such as pretty women, sport cars, and foods. A lot of research and literature related to vision indicated that the visual cognition of males and females was different.

Nevertheless, if analyses and experiments can be conducted on visual characteristics, the data and results can be applied to relevant fields to further improve the current life of human beings and advance industrial efficiency and values. In terms of practical aspects, such as visual

communication and advertisement design, if the valued object themes and the preferred images in the visual cognition of males and females can be analyzed and applied to message transmission, the attractiveness, values, and meaning of advertisement can be enhanced.

Since vision is indispensable for all the activities of human beings, it is necessary, important, and developmental to explore the influence of the visual cognition of images on human beings. Except being helpful to understand the personality features and psychological aspects of the research objects, data can be employed to strengthen the functionality of visual messages and further improve the problems existing in the modern life, such as overflowed information and malfunctioned images. Consequently, finding differences through image categorization and experiments is helpful for images to increase the influences and purposes in design applications.

The study aimed to comprehend the differences in image memory between the visual cognition of males and females, which could be further classified into the following three items.

- (1) The differences in image memory quantities between males and females.
- (2) The differences between the better memorized image categories of respectively males and females.
- (3) The differences between the impressive image categories of respectively males and females.

Literature Review

Visual Cognitive

Cognitive Procedure

Message processing in the progress of cognition is of systematic stages or steps. The input messages are certain operational behavior conducted in these stages, and the final response is assumed as the result of these stages and operation (Lin, 2007). The simplified cognitive

model brought up by Solso et al. (2007) divides the entire process into three parts, including stimulus detection, stimulus storage and transformation, and reaction. However, the entire cognitive process can also be regarded as a systematic program. Starting from inputting stimulation, messages are stored in the region called primary memory after being received by sense organs externally and processed by corresponding sense units. If old messages are not repeatedly thought of or applied, they will be replaced by new messages. On the contrary, repeatedly remembered messages will be moved to the region for long-term memory with infinite capacity (Lee, 2000). In light of the aforementioned, when the messages of visual images are extraordinarily complicated, new messages will be continuously replaced by the viewed messages of images, and it is thus difficult for the messages of images to be moved to the long-term memory. Hence, it is meaningful and necessary to investigate the influences of the varieties of images on the visual cognition of human beings. This is helpful to improve the capability of images for conveying messages.

Importance of Visual Cognitive

Vision plays a considerably critical role in our life, and it is the most important one of five senses, namely vision, hearing, olfaction, taste, and touch. Human beings receive 65%-70% of knowledge and information through vision (Chen & Yang, 1998). In addition, other research has also showed that, among all the senses, vision accounts for the most influence (Madanipour, 1996). Visual cognition mainly senses, receives, and processes messages through vision, and it is fairly influential in the research on medical brain coding and cognitive psychology (Tyler & Likova, 2010). Furthermore, national issues related to aesthetic education, cultural promotion, and the cultivation of relevant experts are all closely correlated to visual cognition (Lin & Lo, 2008). Even the messages from the instrument panel of an aircraft are read on the basis of visual

cognition, so it is easy to find that vision is very important for human cognition (Waldron et al., 2008). It can be seen from the aforementioned that the importance of vision for human beings is beyond words, and there has been a great deal of contribution resulted from the research on vision. However, many modern issues about and relationships to vision are still worth discussion and investigation, such as the influence of image varieties on visual cognition.

Memory of Visual Cognitive

Human beings are capable of establishing visual memory for an object or scene in a short time. Melcher (2007) proved by his research that human beings could establish strong visual memory even though they only saw a scene or image briefly. Nevertheless, human beings are in an era flooded by images, and the vision certainly has selective focuses in terms of cognition. However, these decisions are often made unconsciously. For instance, the images of animals tend to be more impressive for some people whereas the images of human figures tend to be more impressive for other people. Complicated information on images is a critical research issue since too many visual images may obstruct the development of pure literature and reduce the desire to learn writing, which may further result in the reduction in writing capability. On the contrary, the importance of image applications is thus revealed. Therefore, for industries relevant to image applications and message transmission, such as advertisement and visual communication, it is worth studying whether or not there are differences in visual memory between genders.

Images

Our life is full of images, which results in that many people gradually view images instead of reading words. Research indicated that the content of media deeply influenced the user behavior of the audience. Since the great number of images and sounds in the electronic media bring the audience more sensory stimulation and thus become popular; the audience used to

electronic media gradually become fond of viewing pictures and images instead of reading words (Guo, 2004). However, issues related to the influence of images on human memory and impression are seldom explored. Consequently, in the study, the images often seen in the daily life were classified into five categories, including Animal, Plant, Cartoon Character, Human Figure, and Culture and Life, for investigation, and the image categorization in the literature was extended for pragmatic investigation.

The Images of Animals

Animal Planet, a famous animal program, is an international animal channel. Animal Planet (2004), the global voting campaign held by this program in 2004, elected the top ten globally popular animals, respectively tiger, dog, dolphin, horse, lion, snake, elephant, ape, whale, and penguin. The aforesaid ten animals were taken as the experimental sources of images in the study.

The Images of Plants

According to the result of street interviews and investigations, it was found that the general public tended to recognize flowers more easily in terms of plants, and females tended to pay attention to the applications and modeling more easily, so they were frequently employed in the applications of visual images. By means of the interviews with several anonymous owners of flower shops, the ten flowers more familiar by Taiwanese currently were sorted out in the study, including rose, lily, chrysanthemum, lotus, sunflower, plum blossom, carnation, cherry blossom, flame tree blossom, and rhododendron, which were taken as the experimental sources of images in the study.

The Images of Cartoon Character

The images of cartoon characters bring people lively and imaginary attraction. They are of considerably visual attraction, and the plentiful character features impress people easily. Ten highly exposed, famous, and representative cartoon characters were selected from the statistics of Yahoo, respectively Rufy (One Peace), Goku (Dragon Ball), Sponge Bob (Sponge Bob), Doraemon (Doraemon), Kiroro (Kiroro), Maruko (Maruko), Batman (Batman), Superman (Superman), Spiderman (Spiderman), and Tinky (Teletubbies), which were employed as the experimental sources of images in the study.

The Images of Human Figures

Human figures are the element most frequently seen in the visual communication and advertisement in daily life, especially the images of celebrities (Lee, 2008), and they are usually influential and easy to be remembered. The celebrities that people know tend to be limited to the figures with salient performances or special contribution in the fields of entertainment, sports, and politics. Therefore, from the media exposure ratio and awareness indexes of many statistics and ranking, such as TIME Magazine, 2010 and Yahoo, 2010, the images of ten celebrities, easy to recognize and remember, were sorted out, including Y. G. Ma, Bruce Lee, Michael Jordan, Tom Cruise, Bill Gates, H. R. Clinton, Sharapova, Oprah Winfrey, Angelina Jolie, and Lady Gaga, in which there were five males and five females. These ten celebrities were also employed as the experimental sources of images in the study.

The Images of Culture and Life

The category of culture and life targeted on the more important or representative images in daily life in Taiwan, such as famous scenery, constructional, and cultural features. In contrast to the aforementioned categories of images, these images tend to be ideological and possess the characteristics of cultures and recognition, so they are still easy to be visually remembered in

certain degree. After investigation, ten images were selected, including Taipei 101, MRT, Chiang Kai-Shek Memorial Hall(Liberty Square), Wii, Lottos, motorcycle, Ice cream, stinky tofu, computer, and perfume, which were used as the experimental sources of images in the study.

Methodology

Experimental Objects

The experimental objects of the study were targeted at the general public between 18 and 40 years old in Taipei. There were not particular constraints on other conditions. Only the experimental objects were proportionally found, including respectively thirty males and thirty females, sixty people in total (N=60), in order to be consistent with the purpose of sexual differences in the research.

The Design of the Experiment

Through the investigation and analysis of literature, the images were classified into five categories in the study, respectively A – Animal, B – Plant, C - Cartoon Character, D - Human Figure, and E - Culture and Life. In each category, ten most representative images were selected, totally fifty images, each of which were titled according to the category for the convenience of the records and coding of the following experiment. By means of Photoshop, all the image samples were modified into the size of 512*512 and the solution of 72dpi, the basic resolution of image display). The images were illustrated by the following five tables.

Table 1. The Images and Codes of Category A - Animal











									
A-1 Tiger	A-2 Ape	A-3 Lion	A-4 Dolphin	A-5 Snake	A-6 Elephant	A-7 Whale	A-8 Horse	A-9 Dog	A-10 Penguin

Table 2. The images and codes of Category B - Plant

									
B-1 Plum Blossom	B-2 Cherry Blossom	B-3 Lotus	B-4 Chrysanthemum	B-5 Rose	B-6 Flame Tree Blossom	B-7 Lily	B-8 Rhododendron	B-9 Carnation	B-10 Sunflower

Table 3. The images and codes of Category C - Cartoon Character







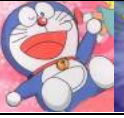













									
C-1 Ruffy	C-2 Goku	C-3 Maruko	C-4 Batman	C-5 Superman	C-6 Kiroro	C-7 Doraemon	C-8 Sponge Bob	C-9 Spiderman	C-10 Tinky

Table 4. The images and codes of Category D – Human Figure

									
D-1 Y. G. Ma	D-2 Bruce Lee	D-3 Michael Jordan	D-4 Tom Cruise	D-5 Bill Gates	D-6 H. R. Clinton	D-7 Sharapova	D-8 Angelina Jolie	D-9 Oprah Winfrey	D-10 Lady Gaga

Table 5. The images and codes of Category E - Culture and Life

									
E-1 Stinky Tofu	E-2 Wii	E-3 Computer	E-4 Taipei 101	E-5 Perfume	E-6 MRT	E-7 Liberty Square	E-8 Lottos	E-9 Motorcycle	E-10 Ice cream

According to the design of the experiment, the aforementioned fifty images were edited by a program and showed to the experimental objects in random number. The fifty images were displayed continuously and unrepeatedly by a projector in the speed of one second per image. Before and after displaying these images, a black screen was respectively held for five seconds to avoid deepening the memory of the 1st image and the 50th image which might further influence the result of the experiment. The total time of the experiment was 1 minute. When the experiment was conducted, the experimental objects were brought to the space with a projector installed, namely the experimental venue. The experiment allowed either group measurement or individual measurement since it depended on the convenient time of each experimental object.

However, to take into account the experimental quality, each measurement allowed the

maximum of ten objects to simultaneously conduct the experiment. The experimental objects were not informed of the purpose of the experiment either before or after the images were displayed in order to avoid the objects' intentional attention on certain images which might influence the result.

After the video was accomplished, the objects were provided the questionnaire and informed of the purpose of the experiment. The questionnaire was filled out accordingly by the objects to comprehend the result of the experiment. The experimental objects included respectively thirty males and thirty females, and totally sixty copies of questionnaire were retrieved. The question items in the questionnaire are listed as follows:

- (1) Gender
- (2) What images did you see? Please specifically list the names (unlimited number).
- (3) Which three images are your favorite or most favorable images in terms of the images you remembered? (Please list them in order of preference.)

Research Result

The Differences in Visual Memory Quantities between Males and Females

Statistics were conducted in light of the data resulted from the questionnaire survey. After applying One-Way ANOVA, it was found that there was not differences in image memory quantities between modern males and females ($p=0.738>0.05$). Males could remember 13.8 images in average, 26 images at maximum or 4 images at minimum. Females could remember 14.2333 images in average, 23 images at maximum or 6 images at minimum. The result of the statistics is indicated by Table 6 and 7.

Table 6. Descriptive Statistics (The Comparison Between Male And Female Memory Quantities)

Gender	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower	Upper		

					Bound	Bound		
Man	30	13.8000	5.35885	.97839	11.7990	15.8010	4.00	26.00
Woman	30	14.2333	4.61395	.84239	12.5105	15.9562	7.00	23.00
Total	60	14.0167	4.96254	.64066	12.7347	15.2986	4.00	26.00

Table 7. The analysis of One-Way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.817	1	2.817	.113	.738
Within Groups	1450.167	58	25.003		
Total	1452.983	59			

p value=0.738>0.05

The Correlation between Image Categories and Memory

The differential comparison between male and female visual cognition is helpful to understand which type of images are easier for respectively males and females to remember when images are not intentionally memorized. Table 8 indicates the image memory distribution and memory rate of males and females. In terms of visual cognition, both males and females could not strongly remember the images in Category A, B, and E, and only the memory rates of A-1 and A-3 reached 40%, which were still not influential. For Category D, both the average memory rates of males and females were over 50%. In particular, 83% of males and 80% of females remembered D-1, and the memory rates of D-6 and D-10 were not bad, either. Males could not significantly remember the images of Categories C except C-2(58%). However, Category C had certain influence on females, especially C-1(60%), C-6(53%), and C-8(53%).

The Differences in Image Preference between Males and Females

The most attractive and impressive images in the visual cognition of males and females could be found by calculating the number of the preference or impressiveness of an image. According to the result of the questionnaire statistics, the favorite image of males was Y. G. Ma, who was elected as the President of Taiwan in 2008, (an image from Human Figure) whereas the favorite images of females were Rufy, the chief male character in One Piece which was the hottest cartoon, (an image from Cartoon Character) and Lady Gaga, a famous singer, (an image from

Human Figure). It was further found by observing Table 9 that the categories of Human Figure and Cartoon Character were highly attractive and impressive for both males and females.

Table 8. The Statistics For The Image Memory Quantities And Memory Rates Of Males And Females.

Image Category	Image	Memory Quantity (Male)	Memory Rate (Male)	Memory Quantity (Female)	Memory Rate (Female)	Memory Rate (Male and Female)
A Animal	A-1 Tiger	14	47%	11	37%	40%
	A-2 Ape	8	27%	8	27%	27%
	A-3 Lion	13	43%	11	37%	40%
	A-4 Dolphin	5	17%	11	37%	27%
	A-5 Snake	6	20%	8	27%	23%
	A-6 Elephant	4	13%	7	23%	18%
	A-7 Whale	5	17%	2	7%	12%
	A-8 Horse	8	27%	8	27%	27%
	A-9 Dog	2	7%	4	13%	10%
	A-10Penguin	5	17%	3	10%	13%
B Plant	B-1 Plum blossom	4	13%	3	10%	12%
	B-2 Cherry blossom	0	0%	1	3%	2%
	B-3 Lotus	6	20%	6	20%	20%
	B-4Chrysanthemum	4	13%	6	20%	17%
	B-5 Rose	4	13%	6	20%	17%
	B-6 Flame tree blossom	0	0%	1	3%	2%
	B-7 Lily	0	0%	5	17%	8%
	B-8 Rhododendron	2	7%	4	13%	10%
	B-9 Carnation	1	3%	2	7%	5%
	B-10 Sunflower	12	4%	6	20%	12%
C Cartoon Character	C-1 Ruffy	13	43%	18	*60%	52%
	C-2 Goku	18	56%	14	47%	53%
	C-3 Maruko	3	10%	10	33%	22%
	C-4 Batman	14	47%	8	27%	37%
	C-5 Superman	4	13%	8	27%	20%
	C-6 Kiroro	8	27%	16	53%	40%
	C-7 Doraemon	11	37%	9	30%	33%
	C-8 Sponge Bob	10	33%	16	53%	43%
	C-9 Spiderman	8	27%	14	47%	37%
	C-10 Tinky	6	20%	4	13%	17%
D Human Figure	D-1 Y. G. Ma	25	***83%	24	***80%	***82%
	D-2 Bruce Lee	17	57%	19	*63%	*60%
	D-3 Michael Jordan	8	27%	5	17%	22%
	D-4 Tom Cruise	14	47%	17	57%	52%
	D-5 Bill Gates	15	50%	17	57%	53%
	D-6 H. R. Clinton	24	***80%	22	**73%	**77%
	D-7 Sharapova	12	40%	17	57%	48%
	D-8 Angelina Jolie	17	57%	19	*63%	*60%
	D-9 Oprah Winfrey	7	23%	10	33%	28%
	D-10 Lady Gaga	13	43%	23	**77%	*60%

E Culture and Life	E-1 Stinky Tofu	4	13%	5	17%	15%	
	E-2 Wii	5	17%	3	10%	13%	
	E-3 Computer	8	27%	8	27%	27%	
	E-4 Taipei 101	8	27%	3	10%	18%	
	E-5 Perfume	0	0%	1	3%	2%	
	E-6 MRT	9	30%	5	17%	23%	
	The Mean of Image Memory	E-7 Liberty Square	3	10%	0	0%	5%
	Male: 16%	E-8 Lottos	3	10%	6	20%	15%
	Female: 14%	E-9 Motorcycle	3	10%	6	20%	15%
		E-10 Ice cream	2	7%	3	10%	8%

(* indicates the value is between 60-69%; ** indicates the value is between 70-79%; *** indicates the value is over 80%.)

Table 9. The Quantitative Ranking Of Male And Female Preference For Images

Gender	First	Second	Third
Male	D-1(Y. G. Ma) (10 votes)	C-1(Rufy) (8 votes)	C-2(Goku) (7 votes)
Female	C-1(Rufy), D-10(Lady Gaga) (8 votes)	A-3(Lion), C-8(Sponge Bob), D-4(Tom Cruise), and D-7(Sharapova) (5 votes)	C-6(Kiroro) , C-9(Spiderman), and D-8(Angelina Jolie) (4 votes)
Total	C-1(Rufy) (16 votes)	D-1(Y. G. Ma) (13 votes)	D-7(Sharapova) (11 votes)

Conclusion

According to Table 6 and 7, there was not significant difference in the capability of memory between male and female visual cognition ($p=0.738>0.05$). Moreover, there was not difference in the indexes of mean (13.8 images for male; 14.2333 images for females), maximum memory (26 images for males; 23 images for females), and minimum memory (4 images for males; 6 images for females), which further proved that the gender difference between males and females did not influence the capability to visually cognize images.

In light of Table 8, the memory rates of the images in A-Animal (24% for males; 25% for females), B-Plant (7% for males; 13% for females), and E-Life and Culture (24% for males; 25% for females) were significantly low, which indicated that they tended to be less attractive or more difficult to be remembered in the process of visual cognition. The images in C-Cartoon Character (52% for males; 56% for females) and D-Human Figure (24% for males; 25% for females) had higher visual memory rates, but Category C tended to be easier for females to remember.

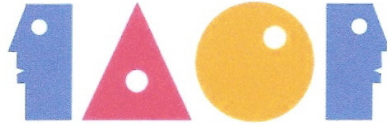
According to the above result, the memory rate of the images in the category of human

figure tended to be considerably high. It was thus known that the images of human figures, or celebrities, tended to be remembered easily by males and females between 18 and 40 years old, and they tended to be cognized by vision from many and diverse images, which indicated the great influence. There was not much difference in terms of each single image. However, the difference was significant between images in Cartoon Character, such as C-1, C-6, and C-8, which indicated that the influence of different images in Cartoon Character on males was highly different from that on females. Finally, in terms of preference (Table 9), the preference of males tended to be more concentrated. However, in succession to the previous result, the images from Cartoon Character and Human Figure accounted for the top three places in preference.

In summary, the images of human figures, or celebrities, were generally more attractive to both males and females, and those images were easier for them to remember. In addition, the images of cartoon characters should be employed according to the audience, that is, males or females, in order to develop the characteristics of being highly attractive, being easy to be remembered, and being different. Consequently, when images are applied to the transmission of messages, such as advertisement and visual design, different applications and planning of images can be conducted according to the genders of the audience by referring to the data in the study in order to achieve the goal of effectively applying the images. Furthermore, there are still a lot of interesting and unknown issues relevant to the visual memory of images, and there is thus a lot of space for future investigation.

References

- Animal Planet (2004). The Top 10 of Animals. Retrieved November 17, 2009, from: <http://animal.discovery.com/>
- Chen, J. H., & Yang, T. M. (1998). *Introduction to Visual Communication Design*. Taipei: Opentech.
- Guo, H. T. (2004). Words to Figures. *Journal of Media Literacy center*, 39, 3.
- Lee, Y. S. (2000). Human Factors Implications of Working Memory Limits. *Journal of Research in Applied Psychology*, 5, 55-67.
- Lee, Z. C (2008). *Advertising Culture*. Zhengzhou: Zhengzhou University Press.
- Lin, J. Y. (2007). *Aged People Life Cognition*. Taipei: Tingmao.
- Lin, Y. C., & Lo, M. L. (2008). *Developing concepts of visual art education: From visual perception to aesthetic caring*. The TNUA 2008 Symposium on Culture Resources.
- Madanipour, A. (1996). *Design of Urban Space: An Inquiry into a Socio-spatial Process*. London: John Wiley & Son Ltd.
- Melcher, D. (2007). Predictive remapping of visual features precedes saccadic eye movements. *Journal of Nature Neuroscience*, 10,903-907.
- Solso, R. L., MacLin, M. K., & MacLin, O. H. (2007). *Cognitive Psychology* (8th Edition). Boston: Allyn and Bacon.
- TIME Magazine (2010, March). Real Top of 100 People. TIME Magazine. Retrieved from <http://www.time.com/time/>.
- Tyler, C. W., & Likova, T. L. (2010). An Algebra for the Analysis of Object Encoding. *Journal of Neuroimage*, 50(3), 1243-1250.
- Waldron, S. M., Patrick, J., Duggan, G. B., Banbury, S. & Howes, A. (2008). Designing information fusion for the encoding of visual-spatial information. *Journal of Ergonomics*, 51(6), 775-797.



International Journal of
Organizational Innovation

NEGOTIATING WITH THE CHINESE AND EMERGING DOMESTIC COMPETITION

Dr. Pranee Chitakornkijasil

Graduate School of Business Administration, National Institute of Development Administration
(NIDA) Bangkok 10240 Thailand.

Email: <wayne.s@nida.ac.th>

Abstract

In this study, bargaining power is considered. Besides, the Chinese negotiation is addressed. This is followed by barriers of the Chinese negotiation. More than that, bargaining with the Chinese government is illustrated. Finally, emerging domestic competition, professionalism application and Chinese MNEs strategies for competition are studied. A topical bibliography is provided

Keywords: Social China, Negotiating, Domestic Competition.

Bargaining Power

Bargaining power means a bargainer's capacity to favorably change to win accommodations from the other parties and to influence the outcome of a negotiation. During the negotiation of the equity joint venture, the outcome depends on the bargaining power of the partners. Bargaining power is dynamic rather than static. It is able to be weakened or strengthened on either side by the local government, key stakeholder, local partner, state-owned enterprise or the foreign investor. If a Multi-National enterprise (MNE) is resource rich, it is less dependent on the local partner for resources. Capital resources invested by the foreign investor, equal shareholding, minority or unequal shareholding and majority shareholding to wholly foreign owned can effect the level of commitment. The more resourceful of foreign investor to the local partner, the higher the equity shareholding in the equity joint venture that the foreign investor shall hold, has higher bargaining power. An example is oil and gas; the local partner owns bargaining resource but lacks of capital and technology that the foreign partner has. The foreign partner cannot access to the field unless through cooperation with the local partner. The cooperation itself creates a new product market for both partners. In the example of garment manufacturing, the local partner can create employment or filling under-utilized capacity, whereas the foreign partner is interested in low labor costs. In the introduction stages of opening protected industry to foreign investment such as telecommunications, which local partner needs know-how and new technology to expand or upgrade the infrastructure. Foreign partners look this initial access as a positive step towards greater long-term investment.

For equity joint ventures, the host country partner is able to include the stakeholders. This is particularly true in China, where a foreign investor find an equity joint venture negotiation that must also negotiate with various government authorities, particularly if the project is essential to

the local municipality or involves a state-owned enterprise. The bargaining power is important behind shifts in MNE mode of entry over time. A weakened foreigner dependence on the local partner for example, access to distribution networks and market knowledge leads to the balance of bargaining power and augments foreign investors selecting wholly owned subsidiaries. Local partner depends on the foreign partner to learn new technology augments the likelihood of the local partner to set up competing ventures independent to the venture with the foreign partner. The ownership of key resources by one partner in the equity joint venture can influence the other partners dependency on that partner. A firm's objective may be better served by cooperation with another. Monitoring over key equity joint venture resources creates a basis for bargaining power. The partner that monitors the key resources shall have more potential partners to select. The partner who lacks strategic key resources shall have lesser dominance in the inter-partner equity joint venture negotiation.

The Chinese Negotiation

The Chinese often show a willingness to compromise negotiators assent to some of their requests, although it is essential that hold on some key concessions and points of renegotiation for the last-minute demands that characterize Chinese deal-making. Throughout the negotiations, the best solution is to find a middle way between saving the negotiator's face and making concessions to the Chinese, while keeping firm's principles and goals. Western enterprises can share valuable experience about international business practices, because they have a longer history of doing business in the global marketplace. The Chinese appreciate this sharing of knowledge, which can develop deeper relationship for future cooperation. A Western party travels to China for business potential forces it to function in a legal environment and a foreign cultural and hence places it in a weaker negotiation position. Negotiators always make reference

to the infamous regulations, the Westerner has no way to know, expect through a good Chinese lawyer or an insider. Chinese negotiators are well known for applying time to their advantage. Aware that Westerners are likely to feel deadline pressure, they always apply delay tactics to refer to stakeholders, outside authorities, or regulations. These tactics to refer to everything takes longer with the Chinese. Informal relationships can effect obligations and high expectations that influence the partnership during and after the negotiation. A win-lose mentality, as the Chinese know, destroys harmony in negotiations.

Barriers of the Chinese Negotiation

Capitalism in China has grown rapidly in the form of joint ventures and strategic alliances between Western and Chinese companies. Many Westerners are developing alliances in China, but do not understand the complexities in the negotiation process, methods to manage, language barriers, cultural differences, work through China's complex bureaucracy, and handling copyrights. China has an emerging role in the world's geopolitical stage. China's Open Door policy attracts Western technology and capital in most industries. Western enterprises regard China as possessing many natural resources, a large labor force and many strategic alliances, as well as market potential for joint ventures, like the most logical entrance strategies into China. Currently, the Chinese government gives the best trading privileges to Western enterprise in joint ventures with Chinese companies. The five steps for alliance set-up in china are as follow: (1) alliance proposal and partner selection approval; (2) preparatory feasibility study approval; (3) joint feasibility study endorse; (4) signing cooperative agreement ; and (5) eventual contract approval and registration. The process may take years going through layers of state and local planning authorities and commissions. Success at one step does not ensure success at another.

Bargaining With the Chinese Government

The ability to negotiate successfully with the Chinese government is a crucial success factor for MNEs in China. Firms must form positive and close relationships with many government entities controlling their operations. China's government has various aspects to their central government, the local government, and the provincial government, all with a crucial role to play, as follow:

- Employ a Local With Government Expertise. Employing Chinese national with expertise and connections in government relationship building is critical for the success of our firm.
- Perceive the Government Mindset. Be realize of the government's effort in supporting the transition. It's better to have a cooperative attitude, than a confrontational one.
- Get Support at All Levels of Government. Assure that we demonstrate respect to all the different levels of the administration by keeping them well informed of our plans.
- Prepare our Homework and Follow the Rules. Be know about actual administrative process. Prepare the right person at the right time, in the right department. Our experts team is crucial for this task.
- Contract the Top Executive. Chinese authorities like to deal directly with the top executive of the company for "face" reasons. Be ready to dedicate an essential part of our time to dealing with them.
- Insist our Ground in Negotiations. Don't be afraid of telling what we want, specifically and clearly, and exactly.

Emerging Domestic Competition

International competitors are well-entrenched in China and are rapidly learning to succeed here. Local companies are changing quickly to adapt to the new consumer oriented economy. In China, local firms are globalizing more, and international players are localizing. Chinese

enterprises are improving in quality. The most challenging competition faced in China comes not from global players but from emerging domestic companies. Chinese enterprises tend to be difficult for foreign managers to assess. Multinational companies faced two competitions: international rivals in the high-priced segment, and domestic competitors in the low-priced sector. Nowadays, low-end domestic telecom and electronics product manufacturers improve product quality and appeal to mass market. Domestic firms are moving up to the upper level. They are now very strong rivals, and they are becoming global. Formerly, Chinese manufacturers produced low-end products sold at low prices. After the full opening of China to foreign investment, foreign products developed in many sectors where foreign brands attracted the top customer income brackets while local companies retained the rest of the market. Today domestic competitors are rapidly approaching international standards of product quality, but maintaining price gaps with foreign-branded goods. The Japanese enterprises feel that they are not able to compete on price, so they move to the high-end market. Local firms are rapidly improving in quality and are repositioning upscale. Nowadays many Chinese firms are very rich in cash, permitting them to require the technology to upgrade products. In fact, the lead time for domestic firms to adapt a product to global class specifications is always only a few months. In consequence, Chinese firms narrow the quality gap, but leave a large price gap. Clients find products that are close to international brand-name quality at prices far below global brand-name rates. To avoid price wars with Chinese producer Sony apply a policy of maintaining price but increasing product value by introducing new features. What Sony does is to introduce new products, but this creates other issues. The product features are very easy for Chinese competitors to learn. Manufactures are not the only MNEs feeling pressure from domestic

Chinese competitors. Chinese enterprises are mostly one-trick ponies: skilled at replicating manufacturing processes, and selling them at a steep discount.

Professionalism Applications

Chinese companies show a marked shift toward greater professionalism from the emerging market-based economy. Nowadays, firms develop by themselves. This is the big change. Competition now exists. Chinese firms are gaining in competitiveness and more are willing to pay professional consultants. Chinese companies now serve mainly Chinese customers. The real growth in consulting nowadays is with Chinese consumers. Global companies already have their [HR] systems, which they import to their China operations. Large and successful private firms are exploding in growth and emerging as very serious competitors with global ambitions. The Chinese managers work very aggressively in transforming their enterprises. Many top executives spend their days working and their evenings and weekends taking EMBA courses. They have great enthusiasm for learning more about business management.

Chinese MNEs and Competition

In the development of the market economy, China shall see the emergence of Chinese multinationals. Local companies, including Haier (White goods), Huawei (telecom), and Lenovo (computers), are already producing and selling branded products internationally. More Chinese brand names shall appear on the global market in the next decade. China competitors are already mainly local companies. In the enterprises' long-cycle businesses (transportation systems, aircraft engines, etc.), its competitors in China are nowadays American and European companies. In the future there will be more global competitors in China. In high-entry-barrier industries such as gas and oil, Chinese MNEs are expected to compete as international players. The clients of

traveling Chinese business people and of Chinese working overseas has created necessary volume. Look at the Chinese market overseas. If we could move a Chinese hotel into Germany or Thailand, Why not? Chinese enterprises are winning the competition battle in China and are now starting to look abroad. The Chinese have a vision of what they need to be, they want to be a technologically leading nation in the world. China market can survive nowadays by following strategies:

- Don't battle, merge
- Pick winnable fights
- Innovate
- But be careful of over-innovation

Don't Battle, Merge

One method to meet the challenge of increased competition from Chinese firms is to join forces rather than continuing to fight. For many companies, acquisitions and mergers offer the benefits of Joint Venture partnerships without the threats and risks.

Pick Winnable Fights

Chinese companies offer market-accepted quality at prices far below those of MNEs. These various sectors are now nearly impossible for global companies to penetrate if targeting a mass market. For foreign enterprises that require to compete in the consumer electronic sector- washing machines, air-conditioners, refrigerators, they find it very difficult to compete as it is a volume game that is very hard to win.

Innovate

Many Chinese companies become expert in developing products and services on a par with those introduced by international enterprises. The best outlive strategies is to move

continually upgrade to stay advance of competitors. Domestic companies know the culture, they can be strong competitors. Constant innovation is necessary. Successful global companies can develop new products and technology faster than competitors. Local firms can catch up, so competitors cannot stay static. They must keep improvement and moving their services and products as well as their understanding of their consumers' needs.

But Be Careful of Over-innovation

One dangerous potential for enterprises targeting the China market is to introduce higher-end products that are not only priced out of range but that have features that local customers do not need. There is a lot of waste in these products. Local manufacturers can develop products with features but sold at far lower retail prices. Local firms are nowadays adept at reverse engineering foreign made products, preserving the most-preferred functions and reducing price. Avoid over-technology products. Offer functionality and quality that matches consumer demand, but don't lose sight of cost. Focus in the global companies' functionality and quality, but not the cost.

Conclusions

Typically, the Chinese like to export products whereas Westerners wish to serve domestic Chinese markets. Handling copyright/legal issues: Western enterprises ought to advise their Chinese partners that copyright compliance serves their long-term interests for exporting. Promises of leading new technology to the venture can also encourage compliance. Managing professional negotiators: While professional negotiators facilitate the negotiation process, they may not hold the best interests for the long range good of the alliance. Westerners ought to strive to concentrate on the negotiations on "win-win" cooperation. Applying consultants effectively: Westerners ought to use seasoned consultants who have time and dedication. Using team work:

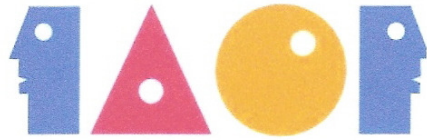
Because personal relationships are essential team continuity over the time of the negotiation process should be maintained on both sides. Westerners need to commit for long term. It may be 18 months.

China's customers, gaining rapidly in wealth have received a reputation among MNEs as sophisticated, price conscious, and demanding, consumers. China represents various markets. Across the nation customers groups different widely in educational background, demographic, and international exposure. MNEs should adapt their products and services and marketing strategies to the diversity they face. Global enterprises must constantly control regulatory changes in their industry, and have issues logistical difficulties in reaching customers. The best solution to reaching Chinese customers may be to invest in local R&D.

References

- Brian Palmer, 1999, "What the Chinese Want," *Fortune*, II October, P 233.
- Change Hui-Ching and G. Richard Holt, 1994, "A Chinese Perspective on Face as Inter-relational Concern," in *The Challenge of Facework: Cross-Cultural and Interpersonal Issues*, ed. by Stella Ting-Toomey, USA: State University of New York Press.
- Christopher Engholm, 1994, *Doing Business in Asia's Booming "China Triangle"*, Englewood Cliffs, NJ: Prentice Hall.
- Daniel Brustein and Arne de Keijer, 1998, *Big Dragon China's Future: What It Means for Business, the Economy, and the Global Order*, New York: Simon and Schuster.
- Danny Ertel, 1999, "Turning Negotiation into a Corporate Capability," *Harvard Business Review* 77, no. 3, May-June: P 69-78.
- Goh Bee Chen, 1996, *Negotiating with the Chinese*, Brookfield, VT: Dartmouth.
- Howard Raiffa, 1991, *Negotiation Theory and Practice*, ed. by J.W. Breslin and J. Z. Rubin, Cambridge, MA: PON Books.

- Jim Rowher, 1999, "Where Does China Get Its Money?" *Fortune*, 5 July, P. 66.
- Jinglan Wu, 2005, *Understanding And Interpreting Chinese Economic Reform*, United Kingdom: THOMSON, South Western.
- Joel Brockner, Ya-Ru Chen, Elizabeth A. Mannix, Kwok Leung, and Daniel P. Skarlicki, 2000, "Culture and Procedural Fairness: When the Effects of What you do depend on How You do It," *Administrative Science Quarterly* 45, no.1 P.146.
- John King Fairbank and Merle Goldman, 1998, *China: A New History* Cambridge, MA: Belknap Press of Harvard University Press.
- Louis Kraar, 1999, "Five Chinese Myths," *Fortune*, 10 May, P.30.
- Louis Kraar, 1994, "The Overseas Chinese," *Fortune*, 31 October, P.57.
- Lucian W. Pye, 1986, "The China Trade: Making the Deal," *Harvard Business Review* 64, no.4 July-August : P.74-79.
- Min Chen, 1995, *Asian Management Systems: Chinese, Japanese, and Korean Styles of Business*, London: Routledge.
- Ming-Jer Chen, 2001, *Inside Chinese Business: A Guide for Managers Worldwide*, Boston, Massachusetts: Harvard Business School Press.
- Murray Weidenbaum, 1996, "The Chinese Family Business Enterprise," *California Management Review* 38, no.4, P 144.
- Oded Shenker, 2005, *The Chinese Century: The Rising Chinese Economy and Its Impact on the Global Economy, the Balance of Power, and Your Job*, Wharton: Wharton School Publishing.
- Wilfried Vanhonacker, 1997, "Entering China: An Unconventional Approach," *Harvard Business Review* 75, no.2, March-April, P 130-140.



AN ANALYSIS OF ESSENTIAL COMPETENCIES OF HOTEL FIRST LEVEL SUPERVISORS

Peir-Yuan Patrick Li
Department of Tourism, Aletheia University
Tamsui 25154, Taiwan
patrick@email.au.edu.tw

Fu-Jin Wang
Department of Tourism, Aletheia University
Tamsui 25154, Taiwan

Abstract

In order to enhancing the hotel industry personnel quality, this study explores the core competencies of the industry's first level supervisors. The study uses the Delphi techniques and analytic hierarchy process (AHP) to extract appropriate assessment criteria. Stage I of this research first collected the essential competencies indicators from the literature. The Delphi technique was used to refine and identify the final indicators for competencies evaluation according to the characteristics of our study case. After gaining the consensus from the experts, dimensions and items of criteria are identified during stage II. Next, it calculated the criteria weights by applying the AHP after constructing the evaluation criteria hierarchy. Finally, it measured the performance corresponding to each criterion. Results demonstrate that the most important constructs in the second level are, in order, "practical operating skills," "self-adjustment abilities," "linguistic abilities," and "basic theoretical knowledge." In the third level, "English fluency," "communication and coordination abilities," "Japanese fluency," "time and EQ management," and "capacity for independent learning" were the five most important elements. Finally, the researchers created a set of adequate evaluation criteria for hotel supervisors and standardized the criteria. An evaluation model for use in promotion and selection was created based on the results of this study. This model can be used by hotels in selecting employees as a standard for recruiting; these results can also be used as reference standard for hotels in selecting and determining the promotion of service personnel to supervisors.

Keywords: Supervisors, Analytic Hierarchy Process, Modified Delphi Method, Hotel Industry

Introduction

The hotel industry is an extremely important component of the tourism industry. Hotels that provide living spaces, food, entertainment, shopping, and conference venues occupied the most important position. And hotel operations are an employee-centric industry. In the past, as Stonham (1992) has noted, that human resources will become the primary weapon for enterprise competition in the twenty-first century. Worker skill levels and team cooperation will be the key criteria for victory. In the hotel industry, supervisors and managers are the core of the management level (Kavanaugh & Ninemeier, 2007). Thus, the core competencies that supervisors and managers must have constitute a topic of great importance. This paper proposes a reference for the importance of the core competencies of hotel first level supervisors in order to provide hotel operators, supervisors themselves, and human resources departments with a reference for training planning.

Literature Review

Previous studies dealing with first-level supervisory personnel can be divided into three main categories. The first category includes examination of supervisory personnel competencies in the banking, construction, electronics, and banquet operations. The second category includes research on the impact of supervisory personnel on different levels in different industries. The third category includes the gap between school education and the actual needs of hotels.

So far, researchers have identified supervisor competencies in different industries, Daniel (1992) analyzed the leadership competencies required by supervisory personnel in the electronics manufacturing industry, while Mathieu et al. (1987) performed an investigation of supervisory personnel in the banking industry. Serpell and Ferrada (2007) suggested that the construction of an occupational competency framework for supervisors in the manufacturing industry can help companies create plans for designing and implementing training. However, what kind of

occupational competency model is appropriate for hotel industry? There has been little empirical research on this issue.

The second category of studies includes researching the impact of supervisors in other industries on different aspects. Moates & Kulonda (1990) suggested that organizational scale has an impact on functional differences between supervisors. It is readily apparent that the issues dealt with by supervisors in organizations of different scales have substantial differences. Supervisors in smaller organizations typically have qualitatively heavier responsibilities than supervisors in larger organizations, since organizational scale affects what must be done in practice by supervisors. Calhoun & Jerdee (1975) indicated that the professional training of supervisors differs at different levels. It is evident that the training and professional needs of supervisors differ between levels; however, the study does not clarify whether there are competencies or training commonly required between levels. Our study will focus on the examination of this aspect. This study applies the results of the studies above to the hotel industry. What are the competencies required of supervisors in the hotel industry? The research on first level supervisor competency, however, is lacking.

The third category of studies discerned that there is a gap between the education provided by schools and the actual needs of hotels. Dimmock et al. (2003) examined whether educational courses meet the needs of the industry, and Raybould & Wilkins (2005) observed that managers believe that learning skills, problem-solving capabilities, and self-management are the most imperative requisites. A research by Jauhari (2006) investigated the correlation between the competencies required by the hotel industry and the hotel management courses offered to determine whether the courses met the needs of the industry. This research demonstrated a clear gap between the competencies required by hotels and the school curriculum. Evidently, it is

increasingly valuable to develop the managerial abilities and skills of students while they are in school and increasing number of educational institutes are strengthening courses in this field. In the hotel industry, supervisors include top, middle and supervisory level. As a supervisory, they are critical to the success of the organization (Kavanaugh & Ninemeier, 2007). What competencies should these supervisory level supervisors possess? This perspective is rarely explored, and there has been little, if any, research conducted on the core competencies required by first level supervisors. This study will attempt to elucidate and standardize the core competencies required by first level supervisors in the hotel industry. Then, the study tried to reveal these factors and design an adequate recognition and promotion assessment model to provide hotels with a reference for human resource talent selection and recruitment.

Role and Skills of First Level Supervisors

First level supervisors are the lowest ranking management in the hotel industry and have typically received little formal training. However, they are expected to directly face and lead a large number of full-time and part-time staff members, and they play the role of encouraging knowledge sharing between superiors and subordinates (MacNeil, 2004). First level supervisors are responsible for their supervisors, subordinates, clients, peers, and themselves. This position is often the first managerial position held by hotel employees, and constitutes the first step on the management track. The position requires training, keeping abreast of recruiting and selection procedures, managing productivity and controlling labor cost, evaluating and coaching employees, disciplining procedures, managing change, and acquiring skills related to production management and labor costs (Kavanaugh & Ninemeier, 2007).

Core Competencies of First Level Supervisors

Tas (1988) defined competency as performance of duties based on one's ability to accomplish specific job related tasks and assume the role connected to the position. Core competencies are defined as the knowledge learning effects accumulated by the organization up until this point, requiring sufficient communication, participation and input from operating units in order to integrate technologies from different fields and provide specific benefits and value. Core competencies are like knowledge in that they must be improved to be retained. It can be strengthened through sharing and application (Hamel & Prahalad, 1990; Prahalad & Hamel, 2002). Chung-Herrera et al. (2003) postulated that a competency model is a descriptive means that identifies knowledge, skills, abilities and behaviors needed to perform successfully in an organization. It is intended to help an organization meet its strategic objective through building human resources ability and competency modeling focusing on behavior rather than personality traits. Studies related to the competencies of first level supervisors in the manufacturing industry have listed necessary core competencies including planning and designing operating procedures in accordance with project planning and corporate tactics and strategies, leading internal and external teams in implementing and planning personnel management strategies, supervising project activities and implementation, and confirming methods, safety, and environmental standard processes in accordance with organization quality systems (Serpell & Ferrada, 2007). The electronics industry requires that managers supervise employees, determine production plans, quality control, and overlook financial management as well as internal management (Daniel, 1992). Automated factories require attributes like good working attitude, communication skills, administrative capabilities, and intelligence (Hong et al., 1996).

Research Methods

The Delphi method is also known as the expert judgment method. It is a group decision method often applied to qualitative research. The modified Delphi method was developed from the traditional Delphi method and generally involves the same methodology. Experts provide their knowledge, opinions, and experiences to formulate a consensus on an issue by completing questionnaires in written or electronic format. The Delphi method is typically applied to a specific topic to take advantage of the special experience and knowledge of experts.

The Delphi technique was developed in the late 1940s by the Rand Corporation (Kaynak & Macaulay, 1984; Linstone & Turoff, 1975). A small group of experts is selected to respond independently in a designated timeframe to a problem scenario. The information is consolidated and edited after each round. Linstone & Turoff (1975) described the Delphi as a way of constructing a group communication process so that the procedure is effective in allowing a group of individuals as a whole to deal with a complex problem. The Delphi technique is method of eliciting and refining group judgements based on the rationale that a group of experts is better than one expert when exact knowledge is not available (Kaynak & Macaulay, 1984). Delbecq et al. (1975) noted that approximately 15 participants are sufficient in the Delphi process when a group is homogeneous, and the scholars and experts interviewed by this study are fairly homogeneous.

Multiple rounds of feedback cycle questions are used until the variance between expert opinions is minimized. This method extracts the advantages from survey investigation and conference discussion. The principles are based on structured information flow, anonymous group decisions, and expert judgment. The selection criteria were: Fifteen scholars and experts who have been teaching courses related to hotel management or food and beverages management with at least eight years of experience, or hotel operators who had previously served as top

management or enterprise owners to whom supervisors directly reported, and middle management who are serving or previously served as direct superiors to supervisors as the subjects of the Delphi method in this study. A leadership role within the participant's professional setting; and accessibility and willingness to engage in intellectual dialogue. To minimize interference, expert group opinions are accumulated and synthesized. These scholars and experts are academics of department of hospitality and tourism, government authorities, industry experts, and policy-makers. Expert opinions are used to identify the principal factors to be considered in supervisor competencies. They were inquired to help the study to construct the structure of AHP hierarchy and offer comments for the preliminary questionnaire design.

The “modified Delphi method” was used to compile the group decision-making opinions of the experts to determine appropriate evaluation and selection criteria. This research designed four main assessment constructs and 17 evaluation criteria, and then used the Analytic Hierarchy Process (AHP) to decide the relative weights of the criteria. To obtain accurate data, we also performed a survey investigation of three types of stakeholders—namely, equivalent positions, direct managers, and back office managers in 14 hotels across Taiwan. The subjects of the pre-testing survey included 30 managers from the Sheraton Hotel, San Want Hotel, and Pacific Wellness Spa & Club. Reconfirmation of reliability analysis was performed for the factors of the pre-testing survey (the highest score of the four constructs was self-adjustment, Cronbach's $\alpha > 0.886$; followed by hands-on operating skills, Cronbach's $\alpha > 0.856$; basic theory, Cronbach's $\alpha > 0.774$; and finally linguistic abilities, Cronbach's $\alpha > 0.703$. All Cronbach's α was > 0.7).

Analysis of Hierarchy Process (AHP)

Many multi-criteria models have been formulated since the 1960s, each one with advantages and disadvantages. There are numerous decision-making or multi attribute evaluation

(MAE) tools. For instance, Decision Making Trial and Evaluation Laboratory (DEMATEL), or gap analysis, or Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), or Elimination et Choice Translating Reality (ELECTRE) or Multi Criteria Evaluation with Qualitative and Quantitative data (MEQQD) or analytic hierarchy process (AHP). In each case, the most appropriate must be chosen, weighting the pros and cons of each model. For years analytic hierarchy process (AHP) has been used in tourism planning (Moutinho & Curry, 1994), and convention site selection (Chen, 2006). However, there have been very limited empirical studies combined Delphi technique and AHP to discuss the competencies of the hotel industry. This paper analyses these factors based on AHP for the industry.

A comprehensive literature review on competencies indicators of hospitality industry is available in the text. First, we collected a series of indicators of competencies from the literature related to hospitality industry. Second, the Delphi technique was used to refine and identify the final indicators for competencies evaluation according to the characteristics of our study case. Third, the Analytic Hierarchy Process (AHP) was applied to calculate the weight of each criterion after the evaluation criteria hierarchy was constructed. The Delphi technique was developed in the late 1940s by the Rand Corporation (Kaynak & Macaulay, 1984; Linstone & Turoff, 1975). A small group of experts is selected to respond independently in a designated timeframe to a problem scenario. The information is consolidated and edited after each round. Linstone & Turoff (1975) described the Delphi as a way of constructing a group communication process so that the procedure is effective in allowing a group of individuals as a whole to deal with a complex problem. The Delphi technique is method of eliciting and refining group judgements based on the rationale that a group of experts is better than one expert when exact knowledge is not available (Kaynak & Macaulay, 1984). Delbecq et al. (1975) noted that

approximately 15 participants are sufficient in the Delphi process when a group is homogeneous, and the scholars and experts interviewed by this study are fairly homogeneous.

The Analytic Hierarchy Process (AHP) (Saaty, 1980), since its invention, has been a means at the hands of decision makers and researchers; and it is one of the most widely used multiple criteria decision-making tools. It is a method for formulating, describing and analyzing decisions. It can be used to solve complex decision-making problems and is a decision support tool that can take into account tangible and intangible conditions. AHP is a decision support tool that can be used to solve complex decision problems taking into account tangible and intangible aspects. Therefore, it helps decision makers to make decisions involving their intuition, knowledge and experience. As a result, the decision makers make judgments most consistent with their intuition, knowledge, and experience. Many scholarly articles have widely applied this method, including those dealing with planning and development, selecting best alternative, conflict resolution, resource allocations, optimization, forecasting, priority and ranking, decision making, evaluation, allocations, and configuration, etc., and numerical extensions of AHP. Application areas ranging from engineering, personal, sociology, manufacturing, investment portfolios, government, sports, education, commerce, industry as well as aerial transportation (Vargas, 1990; Vaidya & Kumar,2006; Berrittella & Franca & Zito, 2009). AHP is used in this paper because of it can be help the decision maker to sense the depth of the problem to give an indication of what values can be considered as low, high or medium. The competencies model are prioritized by using AHP. This approach could be valuable in developing a competencies evaluation model of hotel first level supervisor, although it has not been attempted.

The questionnaires were delivered for survey to confirm the reliability test of the key factors. To avoid biases and the collection of unsuitable factors, the study followed the

guidelines to screen the factors. When all scholars and experts feel the factors should be deleted, they will be removed. As long as a scholar or expert considers a factor should be kept, it will show up on the questionnaire.

The AHP is employed in this study because it is appropriate for the evaluation of qualitative information and can break down complex problems from the top level to the bottom level while collecting relevant decision-making personnel for assessment, in order to analyze the prioritization of constructs and criteria. This study involves a research method with two stages and one round of questionnaire survey. The first step is the modified Delphi method, whose purpose is to complete the final AHP hierarchy framework. The AHP framework and the evaluation constructs and criteria at various levels are based on factors extracted from Lenehan, 2000; Chung et al., 2003; Agut & Grau, 2002; Serpell & Ferrada, 2007; Daniel, 1992; Tesone & Ricci, 2006; Hong et al., 1996; Calhoon & Jerdee, 1975; Moates & Kulonda, 1990; and Lazanski, 2004. Statistical analysis was performed using the SPSS for Windows 17.0 (2009) software suite for reliability testing of the initial study. AHP applied Expert Choice 2000 2nd edition (2003) for analysis of recovered AHP questionnaires.

Results

A total of 360 surveys were distributed to the following 14 hotels: Grand Hotel, Far Eastern, Silks Palace, Hotel B, Fullerton, Sheraton, Evergreen Taichung, Westin, Ambassador Kaohsiung, Victoria, Imperial, Miramar Garden Taipei, Sun Want, and Sheraton. After subtracting 6 incomplete or erroneous questionnaires, we recovered 173 valid questionnaires for a response rate of 48%. The period of investigation spanned from July 15 to September 5, 2009.

Table 2. AHP Total Sample Questionnaire Recovery Table

Survey respondent	Questionnaires distributed	Questionnaires recovered	Valid questionnaires recovered	Response rate (%)
Equivalent position	200	99	95	47.5%
Direct supervisor	120	58	56	46.6%
Back office	40	22	22	55%
Total	360	179	173	48%

Sample Analysis

A statistical analysis was performed on the personal data of respondents from the 173 valid questionnaires. Items included department, position, seniority, educational background, and graduation from a relevant field of study. A plurality of respondents served in the food and beverage department, constituting 46% of the total respondents. In position distribution, “equivalent position” was the highest at 57%; 40% respondents had served for at least nine years, while 54% respondents had graduated from unrelated fields of study. Since research respondents were generally hotel management level first level supervisor personnel, their direct superiors were highly educated. With respect to education, 69 respondents had bachelor’s level degrees (40%), while 19 had master’s level degrees (10%), constituting a total of 50%.

Table 3. Matrix and Weighting for “Level Two Assessment Construct”
Paired Comparison

Level 2	f 1	f 2	f 3	f 4	priority of hierarchy	Priority
Basic theoretical knowledge f 1	1	0.704	0.729	0.662	0.189 ^d	4
Hands-on operating skills f 2	1.420	1	1.123	1.190	0.290 ^a	1
Self-adjustment abilities f 3	1.370	0.890	1	1.030	0.261 ^b	2
Linguistic abilities f 4	1.510	0.840	0.970	1	0.260 ^c	3

Assessment of Level Two

All participants in this study believed the most important was practical operating skills followed by self-adjustment abilities. Stakeholders in equivalent positions believed that “linguistic abilities” is the most important element of core competency assessment constructs for supervisors, followed by practical operating skills. All survey respondents and the three types of stakeholders unanimously suggested that “basic theoretical knowledge” is the least important of the four assessment constructs.

Assessment of Level Three Assessment Elements

Table 4 Analysis Results for Overall Assessment Elements

Level two assessment constructs	Level weighting	Level three assessment criteria	Priority of hierarchy	Global priority	Importance in order
Basic theoretical knowledge	0.189 ^d	Hotel organization and occupational abilities	0.257	0.049	14
		SWOT analytical abilities	0.221	0.042	16
		Financial management and cost control abilities	0.261	0.049	12
		Ability to follow company policies and implement work flow management	0.260	0.049	13
		λ_{\max} 10 CI = 0.003 CR = 0.004			
Practical operating abilities	0.290 ^a	Understanding needs (of subordinates, superiors, customers)	0.193	0.056	10
		Skills of encouraging employees to realize their potential	0.199	0.058	8
		Organization and integration abilities	0.181	0.052	11
		Ability to execute	0.206	0.060	7

		instructions and plans from superiors			
		Ability to supervise and lead	0.221	0.064	6
		$\lambda_{\max} = 2.1$ CI = 0.005 CR = 0.005			
Self-adjustment	0.261 ^b	Management of time and EQ	0.251	0.066	4
		Ability to communicate and coordinate	0.285	0.074	2
		Ability to learn independently	0.248	0.065	5
		Personal career planning and ambition for future development	0.216	0.056	9
		$\lambda_{\max} = 1.2$ CI = 0.004 CR = 0.005			
Linguistic capabilities	0.260 ^c	English fluency	0.490	0.127	1
		Japanese fluency	0.256	0.067	3
		French fluency	0.079	0.020	17
		Taiwanese fluency	0.175	0.046	15
		$\lambda_{\max} = 4.105$ CI = 0.035 CR = 0.039			

It can be observed from Table 4 that the 17 assessment elements in level three are ranked in the following order: “English fluency,” “communication and coordination abilities,” “Japanese fluency,” “time and EQ management,” “ability to learn independently,” “ability to supervise and lead,” “ability to implement instructions and plans from superiors,” “skills for encouraging employees to realize their potential,” “personal career planning and ambition for future development,” “understanding needs (of subordinates/superiors/customers),” “organization and integration abilities,” “financial management and cost control abilities,” “ability to follow company policies and implement work flow management,” “hotel organization and occupational abilities,” “Taiwanese fluency,” “SWOT analytical abilities,” and finally, “French fluency.”

Assessment Of Level Three Assessment Criteria

Basic Theory Construct

It can be observed from Table 4 that all survey respondents believed that, in the level two basic theory construct, the most important criteria was “financial management and cost control abilities,” followed by “ability to follow company policy and implement work flow management,” “hotel organization and occupational abilities,” and finally “SWOT analytical abilities.” In addition, survey respondents and all three types of stakeholders unanimously agreed that “SWOT analytical abilities” is the least important item in this construct.

Practical Operating Abilities Construct

It can be seen from Table 4 that, in the practical operating skills construct, all stakeholders believed that “supervising and leadership abilities” is the most important assessment element, followed by “ability to execute instructions and planning from superiors,” “skills to encourage employees to exercise potential,” and finally “organization and integration abilities.”

Self-Adjustment Construct

It can be noted from Table 4 that, in the self-adjustment ability construct, all survey respondents and stakeholders believed that “communications and coordination abilities” was the most important assessment element, and all survey respondents believed that “time and EQ management” was the second-most important criteria. “Personal career planning and ambitions for future development” was the least important criteria.

Linguistic Capability Construct

It is evident from Table 4 that all survey respondents believed that, in the “linguistic abilities” assessment construct, “English” was the most important assessment criteria. All stakeholders agreed that “Japanese” was the next most important, while “French” was the least important of the assessment elements.

Discussion and Suggestions

As is observed from Table 6, the three categories of stakeholders ranked “English fluency” first in order of importance in the rankings for the third level. It can be inferred that, in the tourism industry, employees often have opportunities to come in contact with customers from foreign countries. Since English is the international lingua franca, it is necessary to have considerable linguistic abilities to successfully communicate, the three types of stakeholders therefore were unanimous in their views on their subject. According to statistics from 2002 to 2007 published by the Tourism Bureau of Taiwan, Japanese tourists were the most common foreign visitors to Taiwan, hence, “Japanese fluency” was ranked second only to English. Stakeholders also ranked “communication and coordination abilities” second and third. It can be inferred that since first level supervisors play vital role between upper management and subordinate. They must execute instructions from upper management while supervising subordinates, implying that communication and coordination abilities are of great importance. A skillful supervisor must also possess “time and EQ management” abilities, since supervisory personnel must play many different roles and spend a significant amount of time dealing with issues and are thus subject to high degrees of stress. As a result, skillful supervisors must have exceptional emotional control and time management abilities.

The “capacity for independent learning” is also an ability that capable supervisors must possess. Since the hotel industry is a rapid changing industry, supervisors must continually improve themselves and actively learn. Table 5 demonstrated that, as ranked by the three types of stakeholders, there is either unanimous consensus or significant difference in opinion on a number of criteria. We discuss seven items in particular below.

Practical Operating Skills

The most interesting and surprising finding is that three types of stakeholders ranked this item either first or second in importance. However, the findings of the current study do not support previous research. Munar & Montaña (2009) suggested that most hotel school graduates have greater advantage in the “basic theory” criterion of the second level, a result differing from that of this study. The results of this study show that practical operating skills are more important as a core competency for supervisors. Whether schools should modify their curriculum as a result of this problem or whether hotel operators should strengthen training courses in this area are issues that are deserving of further research.

Foreign Language Capabilities: English Fluency

The three categories of stakeholders all ranked this item first in importance. It is evident that, in the hospitality industry, staffs often come in contact with foreign customers. As a lingua franca, English is essential for communication. The three types of stakeholders were therefore unanimous in their views on this issue. These results are consistent with those from a study by Lin (2002), which also noted the importance of foreign language fluency for hotel managers.

Self-adjustment Ability: Communication and Coordination abilities

The three types of stakeholders ranked this criterion as second or third in importance. Since first level supervisors play an important role between upper management and subordinate. This position must carry out instructions from superiors while also supervising subordinates. As a result, communication and coordination abilities are highly important. These results are consistent with those of earlier observations. Numerous research (Cobanoglu et al., 2006; Mayo & Thomas, 2005; Lin, 2002) have also noted communication and coordination with other individuals as a core ability that is a requisite in managers.

Ability To Follow Company Policy And Carry Out Operating Procedures

It can clearly be observed from this ranking that there are differences between the views of same-level supervisors and direct supervisors. It can infer that supervisors need subordinates who can carry out company operations, while same-level supervisors are less concerned about this aspect of work.

Understanding (Subordinate/Superior/Customer) Needs

Among stakeholders, same level supervisors ranked this item fifth in importance, indicating a different perspective than those of the other stakeholders. It can infer that same level supervisors hold an awkward position between upper management and subordinates and must play two different roles—employees of the level in question place greater value on this item—resulting in different rankings.

Organization and Integration Abilities

It can clearly be seen from this ranking that there is a gap between back office staffs and other stakeholders. It can infer that since back office staffs deal with more administrative issues, they place greater priority on the organization and integration abilities of employees, producing this ranking.

Personal Career Planning And Future Ambitions

Of the three types of stakeholders, back office employees and same level employees did not include this item in the rankings. It can infer that this may be the result of employers reducing human resources budgets due to the global recession, decreasing resources for future employee development. Employees themselves are also subject to the impact of the environment and may not have long-term plans, producing these results. Upper management may feel that personal career planning should be critical, but many first level supervisors may be unable to

develop their ambitions due to such barriers as educational background, personal ambition, lack of capacity, age, and corporate culture. Future studies on the issue are therefore recommended.

Table 5. Comparison of Second-level Evaluation Criteria for Hotel Supervisor Stakeholder Core Competencies

Second level evaluation construct	Overall	Same level supervisors	Direct superiors	Back-office
Basic theoretical knowledge	4	4	4	4
Practical operating skills	1	1	2	2
Self-adjustment	2	3	1	1
Linguistic abilities	3	2	3	1

Table 6. Comparison of Rankings by Stakeholders for Third-level Evaluation Criteria

Third-level evaluation criteria	Overall	Direct superiors	Same level supervisors	Back office
Hotel organization and position responsibility competencies	14	12	14	15
SWOT analytical abilities	16	16	15	16
Financial management and cost control abilities	12	15	10	13
Ability to follow company policy and carry out operating procedures	13	9	16	14
Understanding (subordinate/superior/customer) needs	10	13	5	11
Ability to encourage employees to actualize their potential	8	8	8	5
Organization and integration abilities	11	11	12	7
Ability to carry out instructions and planning from superiors	7	7	9	9
Supervisory and leadership ability	6	5	4	4
Time and EQ management	4	3	6	6
Communication and coordination abilities	2	2	3	2
Ability to learn independently	5	5	7	3
Personal career planning and ambitions for future development	9	4	13	10
English fluency	1	1	1	1
Japanese fluency	3	6	2	8
French fluency	17	17	17	17
Taiwanese fluency	15	14	11	12

This research created an optimal assessment scale using the results from this research, as shown in Table 7, “Suggested evaluation table for core competencies of first level supervisors in the hotel industry.” The results of this study can provide hotel operators with a reference in designing training courses. This information can aid managers at various levels in the hotel industry with the hiring and recruiting process as well as for internal management. First level supervisors can also use this information as a basis for assessing personal strengths and weaknesses. However, this research is limited in that different types of stakeholders received questionnaires in different proportions. The relatively low numbers of direct supervisors and back of the house personnel may lead to systematic error in survey results. Only a relatively small body of literature exists for the hotel and restaurant industry. Since little research has been conducted on the core competencies of first level supervisory personnel in this field, whether or not utilizing literature related to other industries will lead to errors remains to be seen.

Acknowledgements

We would like express our thanks to the hoteliers, scholars and experts for providing the information for this research. Finally, we would like to thank the IJOI Editor and three anonymous reviewers for their thoughtful direction and encouragement.

References

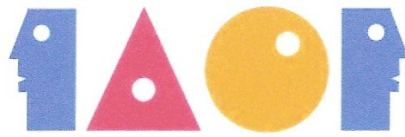
- Agut, S. & Grau, R. (2002) Managerial Competency Needs and Training Requests: The Case of the Spanish Tourist Industry, *Human Resource Development Quarterly*, 13(1): 31.
- Berrittella, M., Franca, L. L, & Zito P. (2009) An Analytic Hierarchy Process for Ranking Operating Costs of Low Cost and Full Service Airlines. *Journal of Air Transport Management*, 15, 249–255.
- Calhoun, R. P. & Jerdee, T. H. (1975) First-level Supervisory Training Needs and Organizational Development, *Journal of Small Business Management*, 28(3): 27.

- Cobanoglu, C., Dede, P., & Poorani, A. (2006) An Analysis of Skills and Competencies of Full Service Hotel Technology Managers, *Journal of Teaching in Travel & Tourism*, 6(4).
- Chen, C. F. (2006). Applying the analytical hierarchy process approach to convention site selection. *Journal of Tourism Research*, 45, 167–174.
- Chung-Herrera, B. G., Enz, C. A., & Lankau, M. J. (2003) Grooming Future Hospitality Leaders: A Competencies Model, *Cornell Hotel and Restaurant Administration Quarterly*, 44(3): 17.
- Daniel, T. L. (1992) Identifying Critical Leadership Competencies of Manufacturing Supervisors in a Major Electronics Corporation, *Group & Organization Management*, 17(1): 57.
- Delbecq, A.L., Van de Ven, A.H., Gustafson, D.H., 1975. Group Techniques for Program Planning: *A Guide to Nominal Group and Delphi Processes*. Scott, Foresman, Glenview, IL.
- Dimmock, K., Breen, H., & Walo, M. (2003) Management Competencies: An Australian Assessment of Tourism and Hospitality, *Journal of the Australian and New Zealand Academy of Management*, 9(1): 12.
- Hamel, G. & Prahalad, C. K. (1990) The Concept of Core Competence, *Competence-Based Competition*, 5(1):11–33.
- Hong, Jon-Chao, Wu, Jinn-Cherng, & Wu, Ming-Hsiung. (1996) Supervisor Skill Formation in Taiwan's Automated Factories, *Work Study*, 45(2): 22.
- Jauhari, V. (2006) Competencies for A Career in the Hospitality Industry: An Indian Perspective, *International Journal of Contemporary Hospitality Management*, 18(2): 123–134.
- Kavanaugh, R. R. & Ninemeier, J. D. (2007) *Supervision in the Hospitality Industry*. Educational Institute-American Hotel & Lodging Association.
- Kaynak, E. & Macaulay, J. A. (1984). The Delphi technique in the measurement of tourism market potential: the case of Nova Scotia. *Tourism Management*, 5(2), 87–101.
- Lazanski, T. J. (2004) Multi-attribute Decision Methods of Candidate Selection for Hotel Animators Based on the Jung-Marston Theory, *Tourism*, 52(3): 267–276.
- Lenehan, T. (2002) A Study of Management Practices and Competences within Effective Organizations in the Irish Tourism Industry, *The Service Industries Journal*, 20(3): 19–42.
- Lin, Shun-Chuan (2002) Exploring the Relationships between Hotel Management Courses and Industry Required Competencies, *Journal of Teaching in Travel & Tourism*. 2(3/4).

- Linstone, H. A. & Turoff, M. (1975). *The Delphi Method: Techniques and applications*. Reading, MA: Addison-Wesley.
- MacNeil, C.M. (2004). Exploring the Supervisor Role as a Facilitator of Knowledge Sharing in Teams, *Journal of European Industrial Training*. Bradford: 28(1): 93.
- Mathieu, J. E., Leonard, J. R., & Russell, L. (1987) Applying Utility Concepts to a Training Program in Supervisory Skills: A Time-based Approach, *Academy of Management Journal*, 30(2): 316–335.
- Mayo, C. R. & Thomas-Haysbert, C. (2005) Essential Competencies Needed by Hospitality and Tourism Management Graduates as Determined by Industry Professionals and Hospitality Educators, *Consortium Journal of Hospitality & Tourism*, 9(2): 5–17.
- Moates, W. H. & Kulonda, D. J. (1990) An Examination of Difference between Supervisors in Large and Small Companies, *Journal of Small Business Management*, 28(3): 27–36.
- Munar, A. M. & Montaña, J. J. (2009) Generic Competences and Tourism Graduates, *Journal of Hospitality, Leisure, Sport and Tourism Education*, 8(1): 70–84.
- Moutinho, L. & Curry, B. (1994). Modeling site location decisions in tourism. *Journal of Travel & Tourism Marketing*, 3(2), 35–56.
- Prahalad, C. K. & Hamel, G. (1990) The Core Competence of the Corporation, *Harvard Business Review*, May–June.
- Raybould, M. & Wilkins, H. (2005) Over Qualified and Experienced: Turning Graduates into Hospitality Manager, *International Journal of Contemporary Hospitality Management*, 17(2/3): 203.
- Saaty, T. L. (1990). *The Analytic Hierarchy Process*, RWS Publications, Pittsburgh, PA.
- Serpell, A. & Ferrada, X. (2007) A Competency-based Model for Construction Supervisors in Developing Countries, *Personal Review* 36(4): 585–602.
- Stonham, P.(1992) Human resources as a strategic weapon. *European Management Journal*, 10(2):264-264
- Tas, R.F., (1988) Teaching future managers. *Cornell Hotel and Restaurant Administration Quarterly* 29 (2): 41–43.
- Tesone, D. V. & Ricci, P. (2006) Toward a Definition of Entry-Level Job Competencies: Hospitality Manager Perspectives, *International Journal of Hospitality & Tourism Administration*, 7(4).

Vaidya, O. & Kumar, S (2006) Analytic Hierarchy Process: An Overview of Applications, *European Journal of Operational Research*, 169, 1–29.

Vargas, L. (1990) An Overview of Analytic Hierarchy Process: Its Applications, *European Journal of Operational Research*, 48(1): 2–8.



RISK AND UNCERTAINTY OF ENTERPRISE DURING DYNAMIC ENVIRONMENTAL CHANGES

Dr. Pranee Chitakornkijsil
Graduate School of Business Administration,
National Institute of Development Administration (NIDA), Thailand.
wayne.s@nida.ac.th

Abstract

An enterprise system exists under conditions of risk and uncertainty. In this case, risk refers to the variability of outcomes (or returns). If an enterprise system has no risk, the return is certain. The enterprise system operating in a risk-free environment would continue to expand forever, since a negative outcome could not occur. Then, risk suggests a limited, ever-expanding enterprise system. Uncertainty is considered as the confidence the enterprise system has in its estimates of how the world works, and in its understanding of the causes and effects within the environment. If there is no uncertainty, then the environment can be perfectly known. If that were true, then everybody could know it (at least for a price), and it could be a source of lasting profit for anyone. Uncertainty is a necessary element of any market, or poker game for that matter. Who can continue to place bets on a hand when all the cards are faced up?

Key Words: Risk and Uncertainty, Dynamic Environmental Changes.

The Modern Entrepreneur

Businessmen consider themselves to be entrepreneurs. Currently, certain classes of *professional entrepreneurs* have been trained to use both methods and technology to analyze the business environment. Nowadays, an entrepreneur “has the intention of building a significant company that can create wealth for the entrepreneur and investors.” Globalization has encouraged an entrepreneurial spirit in both big and small companies. Likewise, information technology now enables many small start-ups to compete against big business.

Environmental Industry and Strategy

Entrepreneurs are able to significantly add to the success of their strategies by understanding the industry environment they are entering. Industry life cycles progress through four stages: transitional, emerging, declining and maturing. The industry life-cycle development is not the same for all industries. The length of each step and the timing of the stages are highly variable and difficult to predict. Entry and competition have different forms depending on which stage of the life cycle the industry is in.

Industry must consider considered strategic, resource, structural, and monitoring uncertainty when developing strategies. These considerations will provide businesses with success, intelligence, capability, resource, and strategies, and will lower barriers to entry for individuals, organizations, and others in the environment. More over, they explain manufacturing approach, product based approach. Industry leaders must consider how to tap into hard to copy and rare resources. Finally, they must consider global and international issues, national problems, and patent protection processes.

Strategic Uncertainty

Emerging enterprises also face many strategic uncertainties. New ventures in emerging industries are often unaware of who the competition is, what types of processes and product the competition is working on, and what posture the government will take toward the new industry. Government regulatory agencies are unlikely to have existing rules to support and guide the new ventures.

Resource Uncertainty

Additional uncertainty looms in the enterprise's input markets. It is always difficult for the new venture to raise capital because financial sources are unfamiliar with the reward profile and the new industry's risk. Aside from that, the selection of supplies, raw materials, and parts may be difficult during the industry's emergence, as well.

Structural Uncertainty

Entry into emerging industries effects certain structural conditions and constraints. The most important imposing structural condition is uncertainty. There is only the unknown future and the firm's need to succeed. Technological uncertainty means that the final configuration of resources and technology remains unsettled during crucial business developmental phases.

Monitoring Uncertainty

Businesses need to generate and develop strategies, and control resources and acquisition processes, making certain that their strategies have four attributes (value, rarity, hard-to-copy, non-substitutable), and they must be designed with sustainable competitive advantage in mind. Customer Uncertainty also plagues the output market.

The Concept of Entrepreneurship

Business Success versus Intelligence

A good theory of entrepreneurship needs to describe why intelligence does not always lead to success in business. You can get smarter without getting richer if the knowledge you possess lacks of the four characteristics (value, rarity, hard-to-copy, or non-substitutes).

New Venture Creation

New venture creation explains the theory and research surrounding the practice and techniques of entrepreneurship. We aim to realize an economic and managerial perspective of entrepreneurship and new venture creation.

Capabilities, Resources, and Strategies

Resource-based theory is the most appropriate to use for understanding new venture creation because it best explains how entrepreneurs themselves build their businesses from the resources and capabilities they currently possess, or can realistically acquire. The application of the theory of industrial organizational economics is insufficient for conducting industry and competitor analysis. What leads to long-term success is the quality and nature of the capabilities, resources, and strategies the entrepreneur possesses.

Barriers to Entry

The interactions among individuals, environments, and organizations make new ventures unique, and therefore must be studied.

Individuals

Knowledge, personal experience, training, and education are the human resources that the founder contributes to the enterprise. One of the most important realizations for the entrepreneur is the establishment of an ethical climate for the new venture.

"Business ethics" has been defined in several ways: (1) business decision that creates value for the customer by matching price and quality, (2) enables the customer to make a free

and informed decision, or to consider alternatives, and (3) generates customer commitment to the organization and the product.

Organizations

All entrepreneurial start-ups are the creation of a new organization. It has strategies that enable it to penetrate or create a market to protect its position. Organizations are made up of people who have talents, skills, beliefs, and values, and may be constructed so that by working together, they create something special. The organization can have a culture that supports high quality and high performance.

Environment

The environment effects both threats and opportunities for new venture creation. The opportunities come mostly in term of resources; people, money, and technology. An entrepreneur acquires resources from the environment, combines them with other resources already in their possession, and configures the new venture into a successful organization. The constraints, or threats, imposed by the environment are those inherent in competitive marketplaces. The entrepreneur can protect the business or overcome constraints by developing strategies that exploit the firm's resources. The key elements of the environment that affect business include politics and the government, technology, the economy (i.e., invention and innovation), socio-demographics, and the ecosystem. Because the environment is characterized by uncertainty, change, and complexity, entrepreneurs must continually control events and trends and make adjustments to their organizations and strategies.

Manufacturing Approach

When we speak of manufacturing process quality, we mean the attention to detail in the construction and delivery of the service or product. Often, a problem between standards and customer preferences is not responsive to changes in the environment.

Product Approach

The concept of quality emphasizes either an attribute to, or the durability of the product.

Hard-to-Copy Resources

Firms that are valuable and that possess rare resources clearly have advantages over firms lacking such assets. However, price may be so high that no profit can be realized. Where duplication is not possible at a price low enough to produce profits, the resources must be hard to copy. There are three factors that make it difficult for enterprises to copy each other's skills and resources: unique historical conditions, social complexity, and causal ambiguity.

Rare Resources

Valuable resources shared by a large number of enterprises cannot be a source of competitive advantage. Due to their being readily available, they are not rare.

Ambiguous Effects and Causes

Causal ambiguity happens when the relationship between effect and cause is not well understood. In business, this could indicate that there is doubt about what and why things happened. When these things are imperfectly understood, it is difficult for other firms to duplicate them.

International Problem and Global

At the global level, critical problems include tariffs, trade barriers, bilateral and political risks, and multilateral relationships. All of these issues are interrelated.

National Problems

Political and governmental analysis at the national level relates to taxation, regulation, antitrust legislation, government spending, and patent protection.

Patent Protection Problems

Enforced patent laws and national governments grant patents. A patent is legal property that enables its holder to prevent others from employing their property for their own use for a specified period of time.

Analysis of Industry

The purpose of industry analysis is to note the attributes that make an industry attractive, and specifically, to decide which segments of the industry are most attractive. This analysis reveals resources and appropriate strategies to be selected or developed. High-growth industries are relatively more attractive for less-efficient enterprises than for efficient firms.

Analysis of Industry aims to explain buyer power, power of supplier, threat of substitution, and barriers to entry. Furthermore, it reveals opportunity sources, perception changes, new knowledge, and unexpected events.

Buyer Power

When all products are the same, it is necessary to distinguish service, quality, or other characteristics.

Same Products.

If the products available for purchase are basically alike, the buyer has power. If buyers can choose alternatives, they naturally ask for a reason to buy one good over another, and a special seller may be able to secure a sale simply by offering a lower price on the product.

Power of Supplier

Like suppliers, buyers exert bargaining power over an industry in two ways. Suppliers seek to (1) decrease the quality of those services and products for the current market-clearing prices or (2) increase the prices they charge for the service and products they sell.

Substitute Threat

Industries compete against each other for customers. Often, the competition is fairly direct. At other times, the substitute-product rivalry is indirect, though still real.

It is necessary for the entrepreneur to understand the nature of substitute products for three reasons. Firstly, when entrepreneurs are first to market a product type or a new product, they believe they have no competition. However, competition always exists in function, and a competitive challenge from a substitute industry is likely to surface. Secondly, substitutes are able to limit the potential returns to industry by placing a price ceiling on what the industry is able to charge. Sometimes, prices can climb so high that it forces customers to switch from one industry's product to another product. The more attractive the value of the substitute, the lower the price ceiling.

Barriers to Entry

Entry barriers are crucial factors for firms in analyzing the industry structure. Entrepreneurs must overcome entry barriers as they presently exist, and later attempt to create entry barriers to prevent others from entering the business.

Opportunity Sources

Changes in the business environment supply opportunities for entrepreneurs. Existing firms have strategy, resources, and organizational structures that prepare them for the present and future environments.

Perception Changes

People have different perceptions of the ways in which services differ from one another, different perceptions of reality, and different ideas about the products they demand and the amounts they are willing to spend on these products. Some groups feel powerful and rich: others, poor. The entrepreneur is able to sell status and power to the powerful and the rich, and sell relief and comfort to the oppressed and the poor.

New Knowledge

New knowledge is always seen as the “superstar” of entrepreneurial opportunity.

Unexpected Events

When present businesses are surprised by an unanticipated event, they are usually unable to adapt quickly enough to take advantage of the situation.

Rivalry Between Enterprises

The effects of strong supplier power, strong buyer power, low-entry barriers, and good substitutes on an industry cause that industry to become more competitive.

Any emerging company must consider isolating for itself a strategy that utilizes first-mover advantage and unique mechanisms. In this regard, isolating mechanism types, quality strategies, growth strategies, and transitional industries emerge. More than that, it allows for mature and declining industries to achieve success. Eventually, it produces demographic changes, an ideal new venture and ideal entrepreneur, as well as risk sharing.

Isolating First-Mover Advantage and Mechanisms

An entrepreneur who is fortunate enough to create a new venture must expect that competitors will try to retaliate and protect their own positions. Therefore, it is necessary for the entrepreneur to find ways to increase these benefits and cash flows for either personal incentives or future

investment. Isolating mechanisms are the methods entrepreneurs apply to prevent the proprietary information generated from the new venture from leaking out, for example.

Isolating Mechanism Types

Isolating mechanisms can take a number of forms. Most obvious are property rights, sources of first-mover advantage, and technological leadership.

Quality Strategy

Total quality management (TQM) programs emphasize customer satisfaction. TQM programs need sure knowledge of the customer through highly developed marketing research. Once the knowledge base exists, the prescriptions normally call for organization-wide commitment, training and team building, top management involvement, and empowerment of individuals to be responsible for quality-related decisions.

Growth Strategies

Basically, the limits of firm growth are limits of resources. Resources determine the industry the firm will enter and the levels of profit it can receive. For example, finance and labor shortages and technological obstacles all limit growth.

Transitional Industries

Transitional industries, those moving from emergence to stability, have certain recognizable natures. At some point, there will be scarce resources, changes in consumer values and tastes, and, finally, a shakeout. The shakeout period is critical, for many firms go out of business at this time. The new venture can estimate these developments, although their precise timing is often problematic due to scarcity of resources and customer changes.

Maturing Industries

It is suitable to think of entrepreneurial strategies in the emerging and transitional environments because that is where the most publicized and visible entrepreneurial activity takes place. Entrepreneurs are not limited by economics, law, or customers to these two phases of the industry's life cycle. Entry can take place in mature industries as well.

Declining Industries

Declining industries are in the stage of the end of unit growth.

Technological Substitution

When an older technology is substituted by a newer one, the older technology goes into decline. However, it does not immediately disappear.

Achieving Success

Under certain conditions, new entrants can state successful niches in declining industries. The key for the new entrant is to find ways to push the incumbents out of the industry, and then purchase their assets at low prices.

Demographic Changes

Changes in demographics are affected by overall product demand.

New Venture and Ideal Entrepreneur

Of course, investors have their "dream" investments. It has a big payoff, takes place overnight, and is without risk. Six of the most important investment criteria are as follows: Potential of cash-out, profitability and wealth are the result of all the other factors falling in place, threats of the environment, management capacity, product differentiation, and market attractiveness.

Risk Sharing

Investors have different reward/risk preferences, and owners who can identify these needs have an advantage in securing financing for their ventures.

Tax Issues and Legalities

Gaining experienced advice and legal assistance is crucial to financing the new venture and resolving the tax issues confronting legalization. Failing to receive an accountant and a good lawyer is worse than the trouble of choosing one. Tax issues and legalities provide successful guidelines, barriers, and opportunities in entrepreneurship.

Finally, we recommend alliances and networking, as well as crucial contingencies and risk assessment.

Success Guidelines

Successful entrepreneurship may develop only after the corporation has learned some lessons and gained some experience from the market. Top corporate executives must nurture the atmosphere and supply the vision necessary to support their people in entrepreneurial activity.

Barriers to and Opportunities for Entrepreneurship

Large firms have certain advantages in creating and exploiting entrepreneurial ideas. Some of these advantages relate to entrepreneurs. Entrepreneurs hold a somewhat more secure position within a large organization. They have a steady income and a job with benefits. They benefit from being part of a social network within the firm, a group of colleagues, friends, and knowledgeable individuals who can support resources, encouragement, and technical aid.

Alliances and Networking

In an alliance or a joint venture, you have to start by asking, “What do our partners need? What are our shared goals and values?” Networking, the process of supporting the entrepreneur’s circle of trust, is a negotiation process. How entrepreneurs arrive at networks and how those help them successful are the subjects of this section.

Crucial Contingencies and Risks

Any new business poses significant risk to investors. There is no guarantee that investors will receive the principal they have invested. As examples of risk, refer to the following: manufacturer niche, difficulties in raising additional financing, failure of market to embrace the product, inability to convince retailers and distributors to produce the product, failure to accomplish production deadlines.

Conclusions

Risk is important for two reasons. First, there is hardly a situation where decisions are made with perfect certainty. The sources of uncertainty are multiple and complicated. They compose income risk, price risk, weather risk, health risk, etc. Consequently, both public and private decisions under risk are of considerable interest. Second, crucial progress has been made in understanding human behavior under uncertainty.

Ignoring risk when corporate strategy is being framed and when projects are being implemented would be unimaginable. In addressing the problem of risk, *Applied Risk Analysis* concerns a novel view of evaluating business decisions, strategies, and projects by taking into consideration a unified strategic portfolio analytical process.

Effective uncertainty management must comprehend effective understanding of uncertainty. Efficient uncertainty management needs an effective process for sorting out which aspects of uncertainty demand to be understood at a deeper level than that currently available. Organizations should apply managers' time wisely, and managers have to wisely choose how much time to spend on each crucial problem.

To begin, risk management concerns balancing rewards and risks. Business leaders are risk takers and are responsible for leadership positions as a result of past success. The challenge for representative leaders is when and how to take *intelligent* risks. Running a successful business is

all about pursuing the right business opportunities with regard to the company's managerial capabilities and financing.

Eventually, risk management concerns balancing people and processes. A company is able to survive a bad process. A company's risk profile is driven by the actions and decisions of its employees. While risk management processes such as risk audit and reporting can provide useful controls, it is more important to ensure that the right people are in place to bring with, and that they are induced by the right culture and incentives. Risk management is about people.

References

Allen, Harris; Bunn, William., "How Risky Is Overtime, Really?" *Harvard Business Review*, May 2007, Vol. 85 Issue 5, p26-26, 1p.

Apgar, David., *Risk Intelligence : Learning to Manage What we don't know*, Boston, Mass.: Harvard Business School Press, 2006.

Berniker, Eli., "The Company Doctor: Risk, Responsibilities, and Corporate Professionalism" (Book). *Administrative Science Quarterly*, Jun2003, Vol.48 Issue 2, p311-314, 4p.

Bothner, Matthew S.; Jeong-han Kang; Stuart, Toby E., "Competitive Crowding and Risk Taking in a Tournament: Evidence from NASCAR Racing," *Administrative Science Quarterly*, Jun2007, Vol. 52 Issue 2, p208-247, 40p.

Bremmer, Ian. "Managing Risk in an Unstable World." *Harvard Business Review*, Jun2005, Vol. 83 Issue 6, p51-60, 8p.

Burgman, Marl A., *Risks and Decisions for Conservation and Environmental Management*, Cambridge, UK; New York : Cambridge University Press, 2005.

Chance, Don M., Brooks, Robert, *An Introduction to Derivatives and Risk Management*, 7th ed., Australia: Thomson/South-Western, 2008.

Chapman, Robert J., *Simple Tools and Techniques of Enterprise Risk Management*, Chichester, West Sussex, England; Hoboken, NJ: J. Wiley & Sons, 2006.

- Chavas, Jean-Paul., *Risk Analysis in Theory and Practice*, Amsterdam; Boston: Elsevier Butterworth-Heinimann, 2004.
- Condamin, Laurent., Louisot, Jean-Paul., Naim, Patrick., *Risk Quantification : Management, Diagnosis and Hedging*, Chichester, West Sussex, England; Hoboken, NJ : John Wiley, 2006.
- Cooper, Cary L. (Cary Lynn), Clarke, Sharon, *Managing the Risk of Workplace stress*, New York : Routledge, 2004.
- Dallas, George S., *Governance and Risk : an Analytical Handbook for Investors, Managers, directors, and stakeholders*, New York : McGraw-Hill, 2004.
- Drennan, Lynn T., McConnell, Allan, *Risk and Crisis Management in the Public Sector*, New York, NY : Routledge, 2007.
- Eccles, Robert G.; Newquist, Scott C.; Schatz, Roland; "REPUTATION and its Risk." *Harvard Business Review*, Feb2007, Vol. 85 Issue 2, p104-114, 11p.
- Herman, Melanie L., *Managing Risk in Nonprofit Organizations : A Comprehensive Guide*, Hoboken, N.J. : Wiley, 2004.
- Jorion, Philippe, 1955-, Global Association of Risk Professionals., *Financial risk manager handbook*, 4th ed., Hoboken, N.J. : Wiley & Sons, 2007.
- Koller, Glenn R. (Glenn Robert), *Assessment and Decision Making in Business and Industry : a Practical Guide*, 2nd ed., Boca Raton, FL : Chapman & Hall/CRC, 2005.
- La Porte, Todd R., "Shouldering Risks: The Culture of Control in the Nuclear Power Industry." *Administrative Science Quarterly*, Mar2006, Vol 51 Issue 1, p155-159, 5p.
- Loader, David., *Operations Risk : Managing a Key Component of Operations Risk Under Basel II*, 1st ed., Oxford: Burlington, MA : Butterworth-Heinemann, 2007.
- McCarthy, Mary Pat., Flynn, Timothy P., Brownstein, Rob., *Risk From the CEO and Board Perspective*, New York : McGraw-Hill, 2004.
- McDaniels, Timothy, Small, Mitchell J., *Risk Analysis and Society : an Interdisciplinary Characterization of the Field*, Cambridge ; New York : Cambridge University Press, 2004.
- Morse, Gardiner., "Innovate at Your Own Risk.", *Harvard Business Review*, May2005, Vol. 83 Issue 5, p25-25, 1p.
- Mun, Jonathan., *Applied Risk Analysis : Moving Beyond Uncertainty in Business*, Hoboken, N.J. : Wiley, c 2004.

- Nohria, Nitin; Stewart, Thomas A., "Risk, Uncertainty, and Doubt," *Harvard Business Review*, Feb2006, Vol. 84 Issue 2, p39-40, 2p.
- Ouchi, Fumika, Would Bank., *A Literature Review on the Use of Expert Opinion in Probabilistic Risk Analysis*, Washington, D.C. : World Bank, 2004.
- Perrow, Charles, "Organizational Encounters with Risk," *Administrative Science Quarterly*, Sep2006, Vol. 51 Issue 3, p517-521, 5p.
- Rejda, George E., *Principles of Risk Management and Insurance*, 9th ed., Boston : Addison-Wesley, c2005.
- Reuvid, Jonathan. *Managing Business Risk* , 3rd ed., London ; Philadelphia : Kogan Page, 2006.
- Reuvid, Jonathan. ,Institute of Risk Management, *Managing Business Risk : a Practical Guide to Protecting your Business.*, 4th ed., London ; Philadelphia : Kogan Page, 2007.
- Sine, Wesley D.; Haveman, Heather A.; Tolbert, Pamela S., "Risky Business? Entrepreneurship in the New Independent-Power Sector," *Administrative Science Quarterly*, Jun2005, Vol. 50 Issue 2, p200-232, 33p.
- Singpurwalla, Nozer D., *Reliability and Risk : a Bayesian Perspective*, New York : J. Wiley & Sons, 2006.
- Todinov, M.T., *Reliability and Risk Models : Setting Reliability Requirements* , Chichester , West Sussex ; Hoboken, NJ : Wiley, 2005.
- United Nations Development Programme. Bureau for Crisis Prevention and Recovery., *Reducing Disaster Risk : a Challenge for Development.*, New York : United Nations Development Programme, Bureau for Crisis Prevention and Recovery, 2004.

THEORY AND PRACTICE OF RESIDENTIAL AREAS' STREET CONFIGURATION AND BURGLARY VULNERABILITY: A REVIEW OF THE LITERATURE

Massoomeh Hedayati Marzbali
University Sains Malaysia, Pulau Penang, Malaysia
Massomeh_hedayati@yahoo.com

Dr. Aldrin Abdullah
School of Housing, Building & Planning, University Sains Malaysia,
Pulau Penang, Malaysia
Aldrin@usm.my

Mohammad Javad Maghsoodi Tilaki
University Sains Malaysia, Pulau Penang, Malaysia
J_maghsoodi@yahoo.com

Abstract

An extensive body of literature has been produced on the topic of crime and space layout which has established several viewpoints regarding this approach. This paper seeks to discuss different views of crime-space approaches in respect to residential burglary and street pattern. Numerous studies have proved that the built environment affects humans' behaviour in terms of fostering or preventing criminal acts. The review concludes that there is a growing body of research supporting the assertion that housing layout and street types are determinant factors for reducing or increasing residential burglary in the urban community. Although this paper may not review all of the studies on housing layout and residential burglary, it nonetheless contains a detailed overview of the most significant research overtook in the field. This paper concludes that there is a large and growing body of research, which supports the claim that spatial layout of the built environment and, in particular, type of street is an effective and pragmatic tool in reducing residential burglary. The results indicate the complex relationship between crime and spatial configuration of the space. Therefore, further and more thorough studies need to be carried out to investigate the influence of spatial configuration of space on burglary in more detail.

Keywords: Urban planning; Residential burglary; Street pattern; Crime prevention; Housing layout.

Introduction

The pace of urbanization has been more rapid all over the world in recent decades. Urban social structures and relationships among people in communities have been influenced by the aspects of rapid urbanization which contributed to the increase of poverty in urban areas. It may appear that today “Crime is part of our way of living” (Brantingham & Brantingham, 1993b, p.22). Crime problems and the fear of crime have become an obvious consequence of today’s society structure. Generally, crime is not equally distributed among all segments of an area. The claim that crime may only be concentrated in particular places has been acknowledged by several studies (Eck, Chainey, Cameron, Leitner & Wilson, 2005; Johnson & Bowers, 2009). This means that certain places within an urban environment have higher crime rates rather than others due to the fact that crime opportunities are not equally exploitable in the whole area. Crime clusters in some locations which are known as crime hotspots, while it appears to be absent in others (Eck et al., 2005). The reason why crime occurrence fosters in some areas and not in others depends on various factors which may come to influence the crime placement (Johnson & Bowers, 2009).

Numerous studies have proved that the built environment affects humans’ behaviour in terms of fostering or preventing criminal acts. The design of a physical environment plays a primary role in providing crime opportunities (Gardiner, 1978). The review concludes that there is a growing body of research supporting the assertion that housing layout and streets’ types are determinant factors for reducing or increasing residential burglary in the urban community. Although this paper may not review all of the studies on housing layout and residential burglary, it nonetheless contains a detailed overview of the most significant research overtook in the field. The causes of crime in urban areas, particularly in housing neighborhoods, depend not only on spatial elements, but also on social elements. Whereas badly designed housing layouts are very

often associated with poor social residents (Shu, 1999), there are different viewpoints regarding the crime-space approach which demonstrate discrepant results in the field. The contradictory findings indicate that the relationship between crime occurrence and spatial configuration of the premises is often not simple. This paper seeks to discuss different views of crime-space approaches in respect to residential burglary and street pattern. The structure of this paper is composed as follows: first, the knowledge gap is discussed. Then, the objective and method of the study is outlined. This section is followed by a review of the research hitherto conducted, summarizing the different analysis approaches and the results that have emerged so far. Then, the conclusion attempts to examine the issues in a more practical light.

The Knowledge Gaps

The reviewed literature reveals that there is an extensive empirical research examining the significant correlation between physical environment and crime incidents in the neighborhoods. However, it appears that there has been surprisingly little empirical evidence in the examination of residential burglary and dwelling's fear of crime in different urban environments, with a critical gap in knowledge regarding the different street patterns.

Previous literature focuses mainly upon two major schools of research: Jane Jacobs' approach and Oscar Newman's Theory. Jacobs suggests that diverse land use can help reducing the risk of crime due to their potential to provide more "eyes on the street". In her idea, a flow of people is key to ensure informal surveillance (Jacobs, 1961). Conversely, Newman indicates that anonymous streets where more strangers appear are considered more vulnerable than dead end cul-de-sacs where strong local inter-visibility in an enclosed area can help a well defined neighborhood to deter and individuate any intrusions of strangers (Newman, 1972). There are some contradictions between these two theories. However, this is due to the different contexts in

which the theories apply. Jacobs focus mainly on the urban and business setting while Newman relates more to residential areas. In addition, in spite of the variety of research in the field of crime and space, yet there are no directly relevant studies that can define whether closing streets or through roads will work in the specific situation (Clarke, 2004). This study attempts to provide some insights with regards to street pattern and residential burglary, focusing on how crime and the fear of crime are perceived by residents across certain design typologies.

Research Objective and Methods

This study focuses on residential burglary in urban neighborhoods. It also attempts to examine the effects of street permeability on burglary risk by way of considering the physical configuration of the street network. As a first stage, the research conducted hitherto was reviewed. Then, a summary of the different studies related to the field and the results that have been produced so far has been overtaken.

The Classification of the Material

Evaluation results were classified by the type of street pattern used in each study. The major concern was the issue of assessing the accessibility and vulnerability. Researchers have suggested several means of describing and classifying street pattern measures and programs in residential burglary. Given the content of the publications, the typology suggested by Shu (1999) was judged most sufficient for the purposes of this analysis. In this classification, the issue of accessibility of street layout and the relative vulnerability of property offences were ordered (Shu, 1999). In light of these considerations, it appears that this approach is useful because it suggests whether certain street patterns may lead to diminish residential burglary whereas others may not. This study does not consider adequately the city structure plan, while only focusing on several types of street patterns. The traditional urban grid includes short blocks, straight streets

and a crosshatched system, while a contemporary suburban street network includes large blocks, curving streets and a branching system (Ewing and Dumbaugh, 2009). Comparing developing and developed countries, it is believed that there are differences in social and environmental context between these countries. Tofigh, Davoudi & Madanipour (2005) argued that contemporary urban planning methods in developing countries could be traced back to the planning ideas of countries such as Great Britain and United States at that time. This paper focuses on road types and the degree of their permeability in order to examine residential burglary.

Review of Literature

Before a discussion of the empirical work's results on street pattern and residential burglary (in which offenders broke into the house), the question which must be answered is whether the publications discussed are proper samples of all the previously published research or not. It is impossible to examine the real number of such research projects due to the lack of an international database containing all the published studies on the topic. In this sense, the studies reviewed here represent only a selective sample. For some time now, planners and criminologists have been keenly aware of the threat presented by residential burglary. The large number of theoretical, methodological and empirical studies about space and residential burglary are proof of such awareness. This paper is limited to an analysis of empirical studies of the street pattern and burglary, foregoing a discussion of the theories used to explain which type of street may contribute to lessen burglary incidents.

The earliest forms of crime prevention's design can be traced in the 1960s and 1970s. They originated from Jacobs' theories (1961), author of "The Death and Life of Great American cities", and influenced the decisions of planners and place-based Crime Prevention practitioners.

Later, the aforementioned theories were largely extended by Newman (1972) in what is known as ‘defensible space’. Hillier & Sahbaz (2008) in their work on ‘an evidence based approach to crime and urban design’, considered these two contradictory bodies of research as the ‘open’ and ‘closed’ solutions and noted that each type proposes social control of crime by design.

Street Design and Crime: The Open and Closed Solutions

According to Schneider and Kitchen (2007, p.47), the best example of an environmental design regarding offence is burglary that is related to street permeability. They identified permeability as “the level of intrusion difficulty”. Accordingly, street permeability and residential burglary are two important factors which play key roles in the safety of community.

Table 1 depicts the flow of generally consistent research regarding street types and burglary incidents. This section attempts to discuss the different views of crime-space approaches in relation to residential burglary. As noted earlier, the issue of crime and space was theorized by Jacobs’ eyes on the street and Newman’s defensible space concept. Consequently, results obtained from other studies have provided evidence to support their ideas. The effect of permeability on crime risk has prompted considerable scholarly research in recent years. At the neighborhood level, street networks vary in the sense of connectivity to other places. To put it simply, some streets are not only designed for local neighbors but have been designed with high permeability and are connected to others in order to carry pedestrian and vehicle traffic. An example is the grid street pattern. On the contrary, cul-de-sacs are designed with less permeability and are mostly used for the movement of neighbors only.

In light of these considerations, it appears that if neighborhood permeability and crime risk have a significant relationship, the crime distribution in the

Table 1: Classification Of The Empirical Studies On The Relationship Between Street Type(S) And Burglary Incidents

Street type(s)	Conclusion(s)	Source
Main roads and cul-de-sacs	Lower risk of burglary is on cul-de-sacs, particularly sinuous in nature. There is higher risk of burglary on integrated street segments and major roads with high permeability.	Johnson & Bowers (2009)
Traditional and modern street patterns	Traditional street (segregated) patterns are the best and modern (grid) patterns are the worst to prevent criminal acts.	Salehi (2009)
Highly accessible streets and strong inter-visibility, segregated streets and low inter-visibility	More passers-by in highly accessible streets with strong inter-visibility can be beneficial as crime prevention strategies due to the mechanisms of informal surveillance generated naturally in these areas. Segregated streets turn out to be extremely vulnerable when combined with low inter-visibility.	Shu (2009)
Residential permeability, cul-de-sacs, through streets, number of dwellings	A large number of neighbors on the street segment and local movement in all directions which brings eyes on the street, either being on a through street or being in a cul-de-sac, have a great effect in reducing burglary risk.	Hillier and Sahbaz (2008)
Permeability of residential street networks	More permeable residential street networks are associated with higher levels of crime than less permeable configurations.	Cozens (2008)
Cul-de-sacs and main roads, and permeability	Houses situated on main roads were associated with high burglary risk, while the ones on cul-de-sacs have been regarded as at lower burglary risk.	Armitage (2007)
Gridiron street layouts and mixed uses	Gridiron street layouts and mixed uses are often crime facilitators, not inhibitors.	Schneider & Kitchen (2007)
Through street, cul-de-sac, integrated or segregated	Linear cul-de-sacs with good numbers of neighbors directly connected to through street may be the safest part of a layout.	Hillier (2004)
Closures street and alley	Street and alley closures can reduce crime in a variety of different settings.	Clarke (2004)
Cul-de-sacs and through roads	Places with segregated areas are more vulnerable than integrated ones due to fewer passers-by to enter the areas, consequently less natural surveillance. Cul-de-sacs's risk of burglary is over two times higher than through-roads with high level of permeability.	Shu & Huang (2003)
Through street, cul-de-sac, integrated (more movement potential) or segregated (less movement potential)	Overall cul-de-sacs pattern are generally less good than through roads due to its effect on impoverishment on public realm. Cul-de-sac may be preferred by burglars, as they deter passers-by and reduce natural surveillance.	Hillier and Shu (2000)
Cul-de-sacs, busy residential street, back road/local traffic	The most victimized locations are houses located on busy residential street or on a back road with local traffic only.	Rengert & Wasilchick (2000)
Roads with entrances on both sides, line neighbors, cul-de-sac	Roads with front entrances on both sides make safer spaces. Fewer line neighbors, segregation and cul-de-sac patterns are the ones that make spaces quite vulnerable.	Shu (1999)
Cul-de-sacs and main roads	A high portion of burglary incidents on houses located on main roads, while the portion of cul-de-sacs patterns was lowest one.	Budd (1999)
Through road and high movements	Highly permeable street refers to more access for residents and strangers and it increases crime opportunities.	Eklblom (1995)
Street accessibility and concentration targets	Crime was higher in more accessible and highly used areas and lower in the less accessible and less used areas.	Beavon et al., (1994)
Tree cul-de-sac pattern	The spatial layout of tree cul-de-sacs patterns as the safest system that can deter occurrence of residential burglary.	Poyner & Webb (1991)
Higher accessibility streets and cul-de-sacs	Neighborhoods with high accessibility may provide more opportunities for crimes, while cul-de-sacs can reduce crime.	White (1990)
Major thoroughfare or small neighborhood street	Low-crime neighborhoods were more likely to have small one-way and two-lane neighborhood streets.	Greenberg and Rohe (1984)
Major thoroughfare or small neighborhood street with	Low-crime neighborhoods tended to have fewer major streets and smaller neighborhood streets than high-crime neighborhoods.	Greenberg, Rohe and Williams

Street type(s)	Conclusion(s)	Source
homogeneous land use		(1982)
Cross intersections, "T" and "L" shape intersections, and cul-de-sacs	Cross intersections are the most accessible and higher crime rates, that 'T' and 'L' shape intersections are less accessible, and cul-de-sacs. Heavy pedestrian and vehicular traffic are associated with higher crime rates.	Rubenstein et al., (1980)
High accessible streets	A street design that accommodates large numbers of those living outside the neighborhood increases both the number of potential victims and the number of potential offenders.	Gardiner, (1978)
Dead-end, cul-de-sacs, 'L' type, 'T' type, through-road	There is a noticeable pattern of lower residential burglary rates in housing located on blocks with lower accessibility.	Nutter and Bevis (1977)
Anonymous streets, dead end cul-de-sacs and inter-visibility ('territoriality' as basis of defensible space)	Anonymous streets where more strangers appear are considered more vulnerable than dead end cul-de-sacs where strong local inter-visibility in an enclosed area can increase a well defined neighborhood to deter any intrusion of strangers.	Newman (1972)
Streets with high accessibility	Streets with higher accessibility and more passers-by could attract more eyes from the buildings to the street and this mechanism of natural surveillance can work effectively against crime.	Jacobs (1961)

Source: Schneider and Kitchen (2007, p.48) and the Authors

environment must vary according to different street types (Johnson & Bowers, 2009). Whilst the two theories of defensible space and eyes on the street differ in the predictions of crime occurrence in spatial configuration of the environment, but they concur on the role of guardians to prevent any crime (Cohen & Felson, 1979). Generally, they introduce convergence in time and space of three basic elements to occur criminal act: they are likely offenders, suitable targets, and the absence of able guardians.

Referring to diverse, open and permeable land uses, there is more continual flow of people (strangers and inhabitants) which contributes to enhance natural surveillance as an effective factor in preventing crime, and can be referred to what Jacobs presents as "a basic supply of activities and eyes" (Jacobs, 1961, p. 40). The research conducted by Hillier (1988) is consistent with Jacobs' work. Hillier defines "intelligible deformed grid" and "constituted outward facing block" as the main environmental features to prevent crime (Hillier, 1988). Hillier considers strangers as beneficial elements in the street system because they prevent crime, when residents can have strong inter-visibility of the surrounding dwellings to protect from strangers. Hillier

confirms the natural surveillance as observed by Jacobs as the main factor to protect residents against crime. Through roads with front entrances on both sides make spaces safer, whereas fewer line neighbors, segregation and cul-de-sac patterns are the factors that make spaces quite vulnerable (Shu, 1999). Indeed, those anonymous streets that Newman defines more vulnerable, are instead considered by Shu as safer patterns. Hillier and Shu (2000) conducted a research on crime and urban layout among three areas in the UK. They employed a space syntax analysis which is a set of techniques to analyze the street network of cities. Hillier and Shu (2000) took into account the point of entry data for the residential burglary. They suggested that overall cul-de-sacs patterns are generally less good than through roads. In this research, the problem of cul-de-sacs has been mentioned due to its effect on the impoverishment of the public realm, which makes a community less safe.

Similar to Jacobs's work, Shu & Huang (2003) examined the relationship between spatial layout and burglary distribution pattern using police recorded data in a Taiwanese context. They found that places with segregated areas are more vulnerable than integrated ones due to fewer passers-by to enter the areas, consequently generating less natural surveillance. They suggested that cul-de-sacs' risk of burglary is over two times higher than through-roads with a higher level of permeability. The results of a study conducted by Baran, Smith & Toker (2007) also support the idea that streets with higher accessibility have lower crime rates compared to places with lower accessibility. In the study of permeability residential burglary, Hillier and Sahbaz (2008) demonstrated that a large number of neighbors on the street segment and local movement in all directions which brings eyes on the street, either being on a grid layout or being in cul-de-sacs, have a great effect in reducing burglary risk. They considered the number of residences and dwellings' affluence as a high effect in vulnerability and safety on the street segments. A recent

study by Shu (2009) confirms that segregated streets become extremely vulnerable when associated with low inter-visibility in the areas, while streets with higher accessibility are very safe when combined with higher inter-visibility and informal surveillance. However, on the whole, researchers with viewpoints similar to Jacobs' have found that busier streets with some pedestrian movement have experienced less levels of recorded crime due to provide surveillance.

In respect of the New Urbanists' design, cul-de-sac street patterns are car-oriented and pedestrian-hostile, compared to grid street patterns (Cozens, 2008). This increases walk ability in permeable grid layouts, promoting social cohesion and a sense of community, and consequently lowering the rates of crime (Morrow-Jons, Irwin, & Ro, 2004). Jacobs' ideas underpin many of the New Urbanists approaches (Cozens, 2008). Consequently, it is obvious that proponents of New Urbanists follow Jacobs' theory in respect to high permeability as a positive design element to promote social cohesion and eyes on the street, thereby reducing crime incidents.

On the other hand, Oscar Newman's work was to some extent contradictory to Jacob's work. Newman focused on territorial functioning in his defensible space model. He argued that anonymous streets with more strangers have higher vulnerability of crime rather than cul-de-sac and dead end streets with high local inter-visibility that can promote neighborhood cohesion (Newman, 1972). His work is different compared to Jacobs' in the sense that he focused more on the architecture of the residential area rather than the urban planning approach and unlike Jacobs, who based her ideas on observation of diverse land use, Newman supports his theory based on empirical findings. In Newman's defensible space concept, the main factor of crime prevention is defined as the spatial control carried out by residents against strangers and offenders. He advocated that low density environments, the single use with territorial reinforcement to restrict the access to strangers, and also places where residents may recognize strangers are able to

generate less crime vulnerability. This approach deals with the changes in design of the built environment to increase the natural surveillance of open spaces provided in the routinely activities of people (Welsh, Farrington & O'Dell, 2010). The findings of the study of Welsh et al., (2010) are consistent with Newman's defensible space. They claim that in inner-city neighborhoods there is a fairly strong evidence of defensible space techniques to reduce crime by street closures.

Poyner and Webb (1991) in their work entitled 'Crime Free Housing' used data of criminal activities that occurred in British suburbs and new towns to explain the effectiveness of physical features on residential crime, adapting their study from Newman's idea. They argue that design faults of individual houses are an important factor in influencing crime, when crime is a function of general patterns of layout. Following Newman's ideology, they suggest that the design can increase or deny crime opportunities. They identified the spatial layout of tree cul-de-sac patterns as the safest system.

In terms of street networks, Ekblom (1995) supported the notion that highly permeable streets generate more access for residents and strangers and consequently increase crime opportunities. In a study by Nutter & Bevis (1977) regarding street accessibility using police recorded data of residential burglary in Minneapolis (USA), they indicated that streets with lower accessibility are associated with lower residential burglary rates and in the same tract, less accessible street layouts with low residential burglary seem to support displacement of burglaries into higher accessible streets. They also mentioned that those street designs that has less residential burglary do not seem to encourage other types of crimes and blocks of the cul-de-sac, dead end, and L-type street designs have been found to have lower burglary rates.

Clarke (1997a) claims that Newman's defensible space provided a basic system to reduce crime vulnerability, specifically for residential burglary. In the study entitled 'Design For Safe Neighborhoods' conducted by Gardiner (1978), the evidence suggests that a street design with high movement of those outside the neighborhood may increase both the number of potential victims and the number of potential offenders in the neighborhood. Gardiner classifies major 'movement generators' as high crime neighborhoods. Several other studies also found that houses located or adjacent to major arteries with high accessibility contribute to the increase of residential burglary (Dietrick, 1977; Newman & Wayn, 1974).

In light of the aforementioned findings, White (1990) stated that neighborhoods with higher accessibility to traffic may provide more permeability and opportunities for crimes and attract more offenders, while cul-de-sacs can have effect to reduce crime. He used police recorded crime data in Massachusetts (USA). He believed that offenders and burglars travel to work and other places and there is no reason why they pursuit on different streets that they do not use commonly. Rubenstein, Murray, Motoyama, Rouse & Titus (1980) found that heavy pedestrian and vehicular traffic are associated with higher crime rates at the neighborhood level. The study reported that the form of street pattern in the neighborhood have effect on crime rate, whereby cross intersections are the most accessible and with higher crime rates, while "T" shape intersections are less accessible, and cul-de-sacs are the least accessible of the analyzed patterns. The findings of the study conducted by Beavon, Brantingham & Brantingham (1994) demonstrated that property crimes take place in known areas including attractive targets at the street segment level. They noted that crime occurs more in accessible and highly used areas rather than in those with less accessibility and usage. In this study, the variable of *accessibility* was measured based on the number of turnings to each street segment (from one to six turns).

Another important study conducted by Taylor (1996) reported that easy circulation and mixed land use at the neighborhood level are associated with higher crime rate, and in particular, to burglary. Consequently, a heavy vehicular traffic that brings strangers into an area contributes to the increase of burglary cases (Beavon et al., 1994; Rengert & Wasilchick, 2000; White, 1990). Focusing on cul-de-sacs, Budd's (1999) descriptive analysis on burglary in England and Wales indicated a high portion of burglary incidents on houses located on main roads, while on the contrary the portion of household's victims of burglary on cul-de-sacs patterns was the lowest one. The research by Rengert & Wasilchick (2000) identifies the factors affecting the burglar's choice of home targets by using in-depth interviews with admitted burglars in three US suburbs. The study noticed that houses near major thoroughfares have higher movements of outsiders, and therefore burglars can be more familiar with the targets. In light of these factors, the residents cannot recognize those strangers which are making a place more vulnerable. They indicated that the most victimized locations are houses located on busy residential streets, on the back roads circulated by local traffic only, and on houses close to pedestrian walkways.

On the other hand, Ratcliffe's (2001) studied residential burglary and urban barriers in Canberra, and the resulting findings are inconsistent with the previous ones. He found that the targets' availability in and out of the offenders' home suburb is the most important factor influencing residential burglary. Consequently, there is no statistical evidence that shows that offenders are inhibited in their travel plan, while burglars choose the targets on the basis of a simple geographical opportunity. Despite different viewpoints on crime and spatial layout, Clarke defines Newman's defensible space as the fundamental theory to protect premises against crime by enabling residents to have surveillance on the public areas around their own dwellings (Clarke, 1977a, 1977b). Brantingham and Brantingham (1981, 1993a, 2003) support the

existence of a relationship between street permeability and crime risk. Their pattern theory of crime is inconsistent with Newman's defensible space theory. They argue that past experiences and future decision contribute to shape a historical trajectory of every criminal incident through routine activities and environmental restrictions. Greenberg, Rohe & Williams (1982) examined differences in physical urban features and various dimensions of territoriality in three pairs of neighborhoods using a household survey and observation in Georgia, USA. The results suggested that physical characteristics have a more determinant effect on high and low crime neighborhoods rather than territorial dimensions. They assert that those areas where the flow of outsiders in and out of the neighborhoods includes the inhabitants, boundary streets, and more homogeneously residential land use with fewer major arteries, generated a lower risk of crime. These types of street are less travelled than those in high crime rates' neighborhoods. Once again the conclusions of this study show that permeability may increase crime risk. Studies have reported that mixed use environments present higher rate of crime than homogenous residential land use (Greenberg et al., 1982; Greenberg & Rohe, 1984).

Professor Bill Hillier in his work entitled "Can streets be made safe", using data from Australia and the UK, suggested that simple linear cul-de-sacs with a good number of residences directly connected to through streets tend to be the safest part of an urban layout (Hillier, 2004). He used a space syntax analysis to find the level of street segments connectivity to others.

Armitage (2007) examined the relationship between permeability and crime risk at the household level in the UK. She measured some housing features such as road type, pedestrian and vehicles movements, burglar alarms, and the adjacency to main roads in a sample of 1,058 homes. The results indicated that those houses situated on main roads were associated with high burglary risk, while the ones located on cul-de-sacs streets have been regarded as lower burglary

risk. She also indicated that those cul-de-sacs that are connected to another main road by a footpath may highly increase the crime risk due to the high permeability of these types of street. Similarly, using police recorded data and ordnance survey in Merseyside (UK), Johnson and Bowers (2009) examined the relation between street permeability and crime location at street segment level by modeling approach. The findings concluded that the lower risk of burglary has been found on cul-de-sacs street patterns, in particular those that are sinuous in nature, while there is a higher risk of burglary on more major roads and integrated street segments that are associated with high permeability. A recent study by Cozens (2008) confirmed that restricting the access to areas may provide fewer opportunities for potential criminals to search for targets, and may also be useful for residents to recognize the non-residents.

Rostami and Madanipour (2006) conducted a study on the patterns of domestic burglary and the built environment in Tehran. They reported that natural surveillance, time and possibility of being recognized as a stranger are issues that are considered to have a large impact on burglar's target selection process. They suggested that wider streets with low visibility and weaker social cohesion tend to increase burglary vulnerability. They noted that reduction of street permeability to limit movement of criminal individuals and gated neighborhoods created when associated with high surveillance might be considered as effective factors in reducing crime. In a study of residential neighborhoods in Malaysia, Haron, Abdullah & Wahid (2006) found that residents who created barriers at their back alley displayed higher territorial functioning, were less fearful of crime and experienced lower crime levels compared to those who were less territorial. Hedayati (2009) conducted a survey to collect data in Penang, Malaysia. It was found cul-de-sacs street pattern are safer than through roads and grid patterns in terms of residential burglary when integrated by communal relationships between residents. On

the other hand, in a study of territorial functioning by Abdullah, Bahauddin, Badaruddin & Ahmad (2005), it was found that street patterns are not the only factor that influences crime. Most break-ins occur in secluded streets where visibility is low. Therefore, the surrounding character of a street is also a main determining factor.

Shu (2009) investigated the relationship between spatial configuration and burglary distribution pattern in the UK and Taiwan. Despite differences in socio-environmental context of these two countries, he found that cul-de-sacs complexes are more popular in the UK than Taiwan, whereas through alleys are more popular road types in Taiwan. Besides these differences, Shu (2009) suggested that through carriageways is considered as safer than other spatial patterns in both countries. Moreover, in the UK linearity tend to be beneficial against crime, while the higher degrees of road accessibility and residents' inter-visibility are two important factors to protect residents from burglary. This is consistent with the study conducted by Shu and Huang (2003) in Taiwan.

Conclusion

An extensive body of literature has been produced on the topic of crime and space layout. This has established discrepant results in respect of this approach. With some exceptions, crime-space literature has been empirically studied in two bodies: Jacobs' approach and Newman's Theory. There are some contradictions between these two theories. In spite of the variety of researches in the field of crime and space, yet there are no directly relevant studies that can define whether closing streets or through roads will work in the specific situation (Clark, 2004).

This paper reviewed the theories and evidence associated with permeability and residential burglary. Numerous studies have revealed that the design of physical environment plays an important role in providing opportunities for crime to occur. The review of the literature

indicates that there is a growing body of research that supports the assertion that housing layout and type of streets are effective tools in reducing or increasing residential burglary in urban communities. Although it may be possible that many recent studies have not been included in this research, it is nonetheless probable that with more than 25 publications reviewed, this paper provided a reliable presentation of the current empirical knowledge on the subject. However, it is important to acknowledge that this sample may provide an incomplete picture of the street pattern and residential burglary distribution.

Jacobs suggested that mixed land use and highly permeability should be associated with low crime rate as they enhance use of place by people which provide more “eyes on the street”. Much of the Charters of New Urbanists are generally underpinned by Jacobs’ idea. New Urbanists advocate the use of grid patterns instead of cul-de-sacs patterns to enhance walkability and thereby promote social cohesion. On the other hand, over the past three decades, research has repeatedly proved that street permeability promotes opportunities for crime. This review of the environmental criminology literature demonstrates that more permeable residential street networks are associated with higher levels of crime than less permeable layouts such as cul-de-sacs. The promotion of permeability and mixed-use development within Jacobs’ theory is challenged when viewed from within an environmental criminological paradigm. Nevertheless, the proponents of defensible space consider permeability as in somewhat negative terms against safety. They claimed that mixed use layouts in urban development areas have also been associated with increased levels of crime. Clearly, such perspectives are problematic and raise the issue of confused and contradictory policy guidance. These inconsistent findings could be due to different reasons such as changes in the 21st century society, changes in the focal point of observation in different research as inner or suburb areas, changes in the levels of walking and

car usage and other independent factors of the project. This paper concludes that there is a growing body of research, which supports the claim that spatial layout of the built environment and, in particular, type of street is an effective and pragmatic tool in reducing residential burglary. The results indicate the complex relationship between crime and spatial configuration of the space. Despite differences in the socio-environmental context between developed and developing nations, it is believed that the pattern of streets might play an important role in the safety of an area as a physical attribute. Therefore, further and longer studies need to be carried out in order to obtain a clearer picture of the relationships between the influences of spatial configuration and burglary in more detail from different urban contexts. It is therefore pertinent that future research should examine the relationship between crime and street patterns across different culture. This should be the next move.

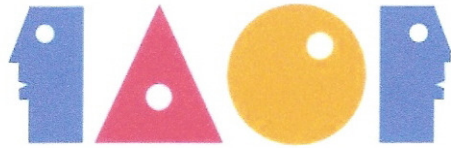
References

- Abdullah, A., Bahauddin, A., Badaruddin, M., & Ahmad, A. G. (2004). Territorial Functioning, Victimization and Fear of Crime: A Comparative Study of High and Low Crime Rate Estates. *Sustainable Development and Planning II*, 2, 1353 – 1362.
- Adeane, M. (2007). Drawings produced by Design. Perth, Western Australia.
- Armitage, R. (2007). Sustainability versus safety: confusion, conflict and contradiction in designing out crime. In K. Pease, G. Farrell, K. J. Bowers & S. D. Johnson (Eds.), *Imagination for crime prevention: essays in honour of Ken Pease*. Monsey.
- Baran, P. K., Smith, W. R., & Toker, U. (2007). *The Space Syntax and Crime*. Paper presented at the 6th International Space Syntax Symposium, İstanbul.
- Beavon, D. J. K., Brantingham, P. L., & Brantingham, P. J. (1994). The influence of street networks on the patterning of property offenses. *Crime prevention studies*, 2, 115-148.
- Brantingham, P. L., & Brantingham, P. J. (1981). Notes on the Geometry of Crime. In *Environmental Criminology* (pp. 27-54). Prospect Heights, IL: Waveland.

- Brantingham, P. L., & Brantingham, P. J. (1993a). Environment, routine and situation: toward a pattern theory of crime. In R. V. G. Clarke & M. Felson (Eds.), *Routine activity and rational choice* (Vol. 5, pp. 259-294). New Jersey: Transaction Publishers.
- Brantingham, P. L., & Brantingham, P. J. (1993b). Nodes, paths and edges: Considerations on the complexity of crime and the physical environment. *Journal of Environmental Psychology*, 13(1), 3-28.
- Brantingham, P. L., & Brantingham, P. J. (2003). Anticipating the displacement of crime using the principles of environmental criminology. *Crime prevention studies*, 16, 119-148.
- Budd, T. (1999). Burglary of domestic dwellings: Findings from the British Crime Survey, *Statistical Bulletin-Home Office Research Development and Statistics Directorate* (Vol. 4/99). London: Home Office.
- Clarke, R. V. (1997a). *Situational Crime Prevention. Successful Case Studies* (second ed.). New York: Harrow and Heston.
- Clarke, R. V. (1997b). *The theory of crime prevention through environmental design*: School of Criminal Justice, Rutgers University.
- Clarke, R. V. (2004). Closing Streets and Alleys to Reduce Crime: Should You Go Down This Road? In Office of Community Oriented Policing Service US Department of Justice (Ed.), *Problem-Oriented Guides for Police* (Vol. 2). Washington DC.
- Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American sociological review*, 44(4), 588-608.
- Cozens, P. M. (2008). New urbanism, crime and the suburbs: a review of the evidence. *Urban Policy and Research*, 26(4), 429-444.
- Dietrick, B. (1977). *The environment and burglary victimization in a metropolitan suburb*. Paper presented at the annual meeting of the American Society of Criminology Atlanta.
- Eck, J. E., Chainey, S., Cameron, J. G., Leitner, M., & Wilson, R. E. (2005). *Mapping crime: Understanding hot spots*. Washington: National Institute of Justice.
- Eckblom, P. (1995). Less crime, by design. *The Annals of the American Academy of Political and Social Science*, 539, 114-129.
- Ewing, R., & Dumbaugh, E. (2009). The Built Environment and Traffic Safety: A Review of Empirical Evidence. *Journal of Planning Literature*, 23(4), 347-367.
- Gardiner, R. A. (1978). *Design for safe neighborhoods*. (National Institute of Law Enforcement and Criminal Justice. Law Enforcement Assistance Administration

- Greenberg, S. W., & Rohe, W. M. (1984). Neighborhood design and crime: a tale of two perspectives. *Journal of the American Planning Association*, 50(1), 48 – 61.
- Greenberg, S. W., Rohe, W. M., & Williams, J. R. (1982). Safety in urban neighborhoods: A comparison of physical characteristics and informal territorial control in high and low crime neighborhoods. *Population & Environment*, 5(3), 141-165.
- Haron, S. H., Abdullah, A., & Wahid, J. (2006). *A Study on Territorial Attitudes and Behaviour Among Ethnic Groups in USJ 18, Subang Jaya*. Paper presented at the International Conference on Sustainable Housing.
- Hedayati, M. (2009). *Perception of Crime and an Assessment of Crime Prevention Through Environmental Design (CPTED) Elements in a Housing Area: A Case Study OF Minden Heights in Penang*. Universiti Sains Malaysia, Penang.
- Hillier, B. (1988). Against Enclosure. In N. Teymur, T.A. Markus & T. Wooley (Eds.), *Rehumanizing Housing* (pp. 63-88). London: Butterworths.
- Hillier, B. (2004). Can streets be made safe? *Urban Design International*, 9(1), 31-45.
- Hillier, B., & Sahbaz, O. (2008). An evidence based approach to crime and urban design. In R. Cooper, G. Evans & C. Boyko (Eds.), *Designing Sustainable Cities: Decision-making Tools and Resources for Design* (pp. 163-186). Chichester, UK: Wiley Blackwell.
- Hillier, B., & Shu, S. (2000). Crime and urban layout: the need for evidence. In S. Ballantyne, K. Pease & V. McLaren (Eds.), *Secure Foundations: Key Issues in Crime Prevention and Community Safety* (pp. 224-248). London: IPPR.
- Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random House.
- Johnson, S. D., & Bowers, K. J. (2009). Permeability and Burglary Risk: Are Cul-de-Sacs Safer? *Journal of Quantitative Criminology*, 1-23.
- Morrow-Jones, H. A., Irwin, E. G., & Roe, B. (2004). Consumer preference for neotraditional neighborhood characteristics. *HOUSING POLICY DEBATE-WASHINGTON-*, 15(1).
- Newman, O. (1972). *Defensible space: crime prevention through urban design* New York: Macmillan.
- Newman, O., & Wayne, F. (1974). *The Private Street System in St. Louis*: New York: Institute for Community Design Analysis.
- Nutter, J. B., & Bevis, C. (1977). *Changing Street Layouts to Reduce Residential Burglary*. United States: Minnesota Crime Prevention Center.

- Poyner, B., & Webb, B. (1991). *Crime Free Housing*. United Kingdom: Butterworth Architecture.
- Ratcliffe, J. H. (2001). *Residential Burglars and Urban Barriers: A quantitative spatial study of the impact of Canberra's unique geography on residential burglary offenders*. Canberra: Criminology research council.
- Rengert, G. F., & Wasilchick, J. (2000). *Suburban burglary: a tale of two suburbs*, 2nd edn. Charles C: Thomas Publishers, Springfield.
- Rostami T., L., & Madanipour, A. (2006). Crime and the city: Domestic burglary and the built environment in Tehran. *Habitat International*, 30(4), 932-944.
- Rubenstein, H., Murray, C., Motoyama, T., Rouse, W. V., & Titus, R. M. (1980). The link between crime and the built environment: The current state of knowledge. *Washington, DC: National Institute of Justice*.
- Salehi, E. (2009). *Environmental Specifications of Safe Urban Spaces* (Vol. First). Tehran: Center for Architectural and Urban Studies and Research, Ministry of Housing and Urban Development.
- Schneider, R. H., & Kitchen, T. (2007). *Crime Prevention in the Built Environment* Routledge.
- Shu, C.F. (1999). *Housing Layout and Crime Vulnerability*. Paper presented at the Space Syntax Second International Symposium, Brasilia, Brazil.
- Shu, C.F. (2009). *Spatial Configuration of Residential Area and Vulnerability of Burglary: Case Studies from UK and Taiwan*. Paper presented at the 7th International Space Syntax Symposium, Stockholm.
- Shu, C.F., & Huang, J. N. H. (2003). *Spatial configuration and vulnerability of residential burglary: A case study of a city in Taiwan*. Paper presented at the 4th International Space Syntax Symposium, London.
- Taylor, R. B., & Harrell, A. V. (1996). Physical environment and crime. *Social Problems*, 40(3).
- Welsh, B. C., Farrington, D. P., & O'Dell, S. J. (2010). *Effectiveness of Public Area Surveillance for Crime Prevention: Security Guards, Place Managers and Defensible Space*. Stockholm: Swedish National Council for Crime Prevention.
- Tofigh, F., Davoudi, S., & Madanipour, A. (2005). *Contemporary Urban Planning Methods: In France, Great Britain and United States*. Tehran: Center for Architectural & Urban Studies and Research.
- White, G. F. (1990). Neighborhood permeability and burglary rates. *Just. Q.*, 7, 57.



RESEARCH ON TV ADVERTISING EFFECTIVENESS OF THE
TAIWAN SUPER BASKETBALL LEAGUE

Li-Yun Chan

Teaching Center of Physical Education,
Nanhua University, Taiwan.
lychan@mail.nhu.edu.tw

Maw-Song Su

Hope-Shine Elementary School Taiwan

Chi-Ming Huang

Department of leisure and Sports Management,
Far-East University, Taiwan.
kiming@cc.feu.edu.tw

TV advertisements have great marketing effective on SBL's development. The research focuses on the influence of SBL's TV advertisements on behavioral goals. The study aim is shown in the following as: know current condition of TV advertisement effectiveness on SBL fans; influence model of framed advertisement recognition and advertisement attitude on behavioral goals; discussion on influence situation of advertisement recognition and attitude on behavioral goals. The research adopts self-compiled "SBL TV advertisement effectiveness" questionnaires. The method used here is convenience sampling of formal testing machetes based on 2010 Ball Season Regular Matches. 360 questionnaires were distributed in 4 testing matches. After eliminating invalid questionnaires, 318 available questionnaires are retrieved and the recovery is 88.33%. After description, testing and discussion on statistics and structural equation modeling, the conclusions are as follows:

1. SBL fans have high-level effectiveness on advertisement recognition and high positive effective on advertisement hobbies. Among behavioral goals, the effectiveness of loyalty and involvement are highly positive.
2. The research adopts SBL fans as study objective and the assumptions on the impact model on behavioral goals of advertisement recognition and of advertisement attitudes are correct.
3. Advertisement recognition and attitudes have positive impact on behavioral goals. Joint explanatory power is 56%. Advertisement attitude has greater impact on behavioral goals than advertisement recognition.

Key Words: SBL, Advertisement Recognition, Advertisement Attitudes, Behavioral Goals

Introduction

Research Background and Intention

From the first game to 2010, SBL is near mature in these seven years. Either is box office or rating grows rapidly (Sun Chuanxian, 2006). Investment of Collegiate Athletic Association in 2007 shows that nearly 50% students from universities in Taiwan play football, which comes to 400,000 people. Nearly three quarters of people watching basketball matches (including live and retransmission), which comes to 700,000 people. Thus, watching competitions is becoming one leisure activity and getting popular. Thus, there is high proportion of Taiwanese taking part in basketball, which lays the foundation of stable growth of SBL. For the research on opinions from basketball involvement people, media effectiveness on SBL's development is worth of concern.

Media offers athletic information for fans and games are explored by media, which highlights the attractions of games. Apart from that, audience get detail game information from media. During the retransmission, games are senders with media as medium and fans as readers and listeners. A close net relation is born. By making use of media, games spread brands among readers and listeners and establish the bridge for communication. (Hung Huangjia, 2003) holds that by spreading sport entertainment news, the market of media is broadened. Sport is used as media information carriers, which is packaged and sold so that ratings of sport and passion of the public improves. Advertisement is one kind of motive to business activities in modern highly commercial society. The advantages of TV advertisements are fast spread speed, vivid and impressive, dynamic and widest involvement. Frequently broadcasting improves public impression. Advertisement has impact on readers and listeners' attitude and transfers feelings towards advertisements to feelings towards brands to accumulate brand assets (Liu Meiqi, 2000). Therefore, TV advertisements are visual descriptions, which mean more attractive, well-

cooperation between flashes and voices, impressive, high effectiveness, adaptability, retransmission possibility and improvement on recognition ratings. Therefore, TV advertisements have highly sale impact on SBL development.

Fans are important groups for whom federations should actively manage. As the rapid development of science and media, the more diversity of leisure choices, how SBL to compete with NBA, MLB transmission, to attract fans to watch SBL games, to make choice between one match of basketball and one film are challenges faced by sport salesmen. Therefore, focusing on the impact on behavioral goals of TV advertisements towards SBL, the research hopes that the results offer some help in sales management of SBL on retransmission level.

Research Purposes

1. Know current condition of TV advertisement effectiveness on SBL fans
2. Influence model of framed advertisement recognition and attitude on behavioral goals.
3. Discussion on influence of advertisement recognition and advertisement attitude on behavioral goals

Glossary

1. Advertisement Effectiveness - Advertisement effectiveness usually adopts communication effect and sales effect as indicating factors. The communication effect of the research is evaluated by advertisement recognition and advertisement attitude. Sales effect is evaluated by behavioral goals.
2. Advertisement Recognition Variables - Advertisement recognition variables mean that after watching target advertisements, the memory degree on advertisement content of examinees. The research adopts unaided free recall as the method to evaluate advertisement memory. Under the

condition without any reference, examinees can recall segments or the whole content of any advertisement.

3. Advertisement Attitude - This means after watching target advertisements, constant good and dislike feelings towards advertisements, which also means the whole opinion of examinees after watching advertisements.

4. Behavioral Goals - This means after watching target advertisements, with the motive of advertisements, behavioral goals are triggered, which also means that after watching advertisement, evaluation is made on loyalty and growth on positive behavioral potential of involvement of examinees.

Study Limitations

The research focuses on advertisement effectiveness on fans. After reading related researches and compiling testing entries of advertisement effectiveness, the complied advertisement effectiveness factors are discussed here with some factors neglected to avoid the influences on measurement on watching satisfaction.

Study Method

Study Object

The pre-test matches are 6 regular matches held on February 6th and 7th, 2010. 30 questionnaires are distributed during each match. Totally, there are 180 questionnaires distributed. After eliminating invalid questionnaires 148 available questionnaires are retrieved and the recovery is 82.2%

Six regular matches held on April 17th and 18th, 2010 are adopted as formal testing matches. The testing method used here is that when the match over, with the help of 10 work-study students in each exit, 60 fans were tested by convenience sampling. Initially, fans were interviewed by

questions that whether they saw TV advertisements on this season and whether they would like to be tested. Then, questionnaire was adopted. 360 questionnaires were distributed in 4 testing matches. After eliminating invalid questionnaires, 318 available questionnaires are retrieved and the recovery is 88.33%.

Study Tools

The research adopts self-compiled “SBL TV Advertisement Effectiveness” questionnaires with the references related study measurement method of Homer (1990), Jiang Mengneng (2006),Huang Hengshiang (2006),Zhang Qiongyin (2005), Shu Liting (2005)etc.. Then, based on research goals and frames, entries are compiled. Three parts are included in the design of questionnaires, with total 24 entries. The first part is advertisement recognition, mainly on evaluation of interviewees’ recognition degree on advertisement contents. The second part is advertisement attitude with the evaluation on interviewees’ acceptance on advertisements. The third part is behavioral goals with the evaluation on interviewees’ feelings on retransmission of SBL after watching advertisements. Based on interviewee’s feelings, the questionnaires are marked with 5 scales of 1-5 points with “totally nonconformity” to “totally conformity”.

Reliability and Efficiency of Measurement Tools

Efficiency of Pre-Questionnaires

Test of questionnaires and project analysis - After retrieving pre-questionnaires and elimination of invalid questionnaires, SPSS for Windows 12.0 version is used to establish documents from 148 questionnaires. Then, project statistical analysis is used. The marginal scores are 27% scores listed from the highest to the lowest of each score table, which are also used to divide high score groups and low score groups. Discernment analysis is based on independent samples T test. The statistics show that t value of each score table is from 7.21 to

9.13, with $p < 0.05$ and differences are highly significant. Therefore, all 24 entries are kept for exploratory factor analysis.

Explanatory factor analysis of pre-questionnaires - The research examines on explanatory factor analysis of pre-questionnaires. After analysis on advertisement recognition factors, 7 entries are examined by explanatory factor analysis and classified in to one factor. Due to low load with main factor, one entry is eliminated. Component value of other entries is from 0.824 to 0.739 and the explanatory variance value is 62.83%. The factor is named as advertisement recognition. For advertisement attitude, 7 entries are examined by explanatory factor analysis and classified into one factor. Due to low load with main factor, one entry is eliminated. Component value of other entries is from 0.828 to 0.771 and the explanatory variance value is 62.83%. The factor is named as advertisement attitude.

For behavioral goals, totally 10 entries are examined by explanatory factor analysis and classified into 2 factors. The factors are named “loyalty” and “involvement degree” respectively. There are 6 entries in loyalty factor and the Component value is from 0.834 to 0.769 of each entry and explanatory variable is 41.4%. There are 4 entries in “involvement degree” factor and the Component value is from 0.889 to 0.794 of each entry and explanatory variable is 29.8%. The accumulated explanatory variable of behavioral goals is 71.2%.The structure of questionnaire SBL TV Advertisement Effectiveness is illustrated by Table 1.

The research makes usage of Cronbach α 's coefficients as the reliability standards for testing each measurement model of pre-questionnaires. The results of pre-test are in Table 2, which shows that in advertisement recognition part, Cronbach α 's coefficient is .886 in advertisement identification sub-scales and in advertisement attitude part, Cronbach α 's coefficient is 0.871 in advertisement hobbies sub-scales.

Table 1: Abstract Table of Explanatory Factor Analysis of Pre-questionnaires

Variables factor	Analyzed factor	Question number	Characteristic value	Explanatory variable	Accumulated explanatory variable
Advertisement recognition	Advertisement identification	6	3.77	62.83%	62.83%
Advertisement attitude	Advertisement hobbies	6	3.61	60.17%	60.17%
Behavioral goals	Loyalty	6	4.14	41.40%	71.20%
	Involvement degree	4	2.98	29.80%	

In behavioral goals part, Cronbach α 's coefficient is .8276 in loyalty sub-scales. Cronbach α 's coefficient is 0.844 in involvement sub-scales. Cronbach α 's coefficient is 0.896 in behavioral goal overall score table. The above results show that there are high inner agreement among each scale of pre-questionnaires and ideal inner agreement reliability index

Table 2: Abstract Table of Reliability of pre-questionnaire

Factor	Factor sub-scales	Question number	Cronbach α
Advertisement recognition	Advertisement identification	6	.886
Advertisement attitude	Advertisement hobbies	6	.871
Behavioral goals	Loyalty	6	.827
	Involvement degree	4	.844

Results and Discussion

Current Condition of TV Advertisement Effectiveness on SBL

Influence Model of Framed Advertisement Recognition and Attitude on Behavioral Goals

The study is to research on influences of advertisement recognition and advertisement attitude on behavioral goals after fans watching advertisement. Based on LISREL, assumed

relation model Fans is testified. The frame of the assumed influence model of the research is illustrated by Figure 1. (See End of Article).

Table 3: Abstract Table of Descriptive Statistic on Effect of Fans Watching TV Advertisement

Factor	Factor sub-scales	Question number	Average	Standard deviation
Advertisement recognition	Advertisement identification	6	3.63	0.48
Advertisement attitude	Advertisement hobbies	6	4.04	0.36
Behavioral goals	Loyalty	6	3.98	0.32
	Involvement degree	4	3.76	0.43

1. Descriptive Statistics on Primary Sources of Advertisement Recognition, Advertisement Attitude and Behavioral Goals

The research assumes that the kurtosis of the model's 4 observed variables is between - 0.449 and 0.817. Skewness is between 1.028 and 0.398. The average of kurtosis and skewness is between ± 2 . This means that the distribution of 4 observed variables are considered as in line with normal distribution and suitable for evaluation and test of adaptability of assumption model.

2. The Overall Model Adaptability Verification

Based on the outer index of LISREL 8.50, the assumption model is testified with the outer index $\chi^2_{(18)}=66.29(p=0.012)$, RMSEA=0.077($p=0.009$), GFI=0.92, CFI=0.86, Standardized RMR=0.024, AGFI=0.91. The above index shows that indexes such as χ^2 , RMSEA, CFI etc. do not reach significant level, which means that this assumed model should be corrected. Model correction is based on LISREL 8.50 correction suggestion. 2 residual correlations and 1 observed variable correlation should be added into assumption model on the basis of correction suggestion. The residual corrections are advertisement identification residual (δ_1) and advertisement hobby residual (δ_2), loyalty residual (δ_1) and involvement residual (δ_2). The observed variable is the

related path of advertisement recognition (ξ_1) and advertisement attitude (ξ_2). After integrating three paths into the riverside model, model adaptability is tested. The indexes after correction are shown below.

In Chi-square test of significant level, the reversed Chi-square value decreases from 66.29 to 29.11 and freedom decreases from 18 to 15. The newly added 3 paths, compared with model adaptability test, have statistical effect. The Chi-square test value is $\chi^2_{(15)} = 29.11$ ($p = .058$) and does not reach the significant level of 0.05. This shows that the assumption model of the research has no differences with observed statistics. The assumption model and adaptability of observed data must be accepted. Besides, the freedom rate of Chi-square (χ^2/df) is 1.94, lower than 2 which meets the normalized standard. This proves that the assumption that the influence model on behavioral goals of advertisement recognition and advertisement attitude is adaptable with observed statistics.

As for other indexes, the indexes of reversed assumption model and the observed data (RMSEA) decrease from 0.077 to 0.042. P of the test for the closeness of fit rises from 0.09 to 0.59. The index of Standardized RMR reduces from 0.024 to 0.021. GFI index rises from 0.92 to 0.94. AGFI index rises from 0.91 to 0.95. CFI index rises from 0.88 to 0.93. This means that the newly added 3 paths have statistical effect on model adaptability test. In addition, result analysis of the significant test on estimated parameters in Table 4 shows that t-values of each variables of the assumption model are bigger than 1.96. Reversed results prove that the adaptability of assumed advertisement recognition and advertisement attitude on behavioral model and observed data is acceptable.

Generally speaking, in the test on adaptability of the assumption on influence model of behavioral goals of advertisement recognition and advertisement attitude and observed data, the

reversed index is $\chi^2_{(15)}=29.11$ ($p=.058$)、RMSEA=0.042 ($p=.59$)、GFI=0.94、CFI=0.93、Standardized RMR=0.021、AGFI=0.91 and the estimated parameter t-value is bigger than 1.96. The above indexes of adaptability test all reach significant level, which means that the assumption model can be used to explain the observed information of the research. In other words, for SBL fans, the research assumption on the influence model of advertisement recognition and advertisement attitude on behavioral goals is correct.

Table 4: Estimated Parameters of Influence Model of Advertisement Recognition and Attitude on Behavioral Goals

Parameters	Estimated Parameters	t-value	Standardized regression coefficient	R ²
$\lambda(X1)11$	1.81	6.59	0.81	0.66
$\lambda(X2)21$	2.79	7.86	0.90	0.81
$\lambda(Y1)11$	1.13	8.84	0.86	0.74
$\lambda(Y2)21$	1.21	7.78	0.79	0.62
$\gamma\xi1\eta1$	1.49	6.54	0.58	0.34
$\gamma\xi2\eta1$	0.31	8.71	0.65	0.42
$\zeta1$	0.03	4.66	0.66	0.44
$\delta1$	0.11	13.05	0.34	-
$\delta2$	0.07	14.29	0.19	-
$\varepsilon1$	0.02	3.88	0.26	-
$\varepsilon2$	0.01	4.67	0.38	-

From Figure 2 (See end of article), it is known that the influence of advertisement recognition($\gamma\xi1\eta1$) on behavioral goals reaches significant level($t=6.54>1.96$) and the direct effect is $\beta=0.58$; and that the influence of advertisement attitude ($\gamma\xi2\eta1$) on behavioral goals reaches significant level($t=8.71>1.96$) and 3. Influence Situation of Advertisement Recognition and Attitude on Behavioral Goals. The direct effect is $\beta=0.65$. From the overall model, the joint explanatory power of advertisement recognition and advertisement attitude on behavioral goals

is 56%. The influence of advertisement attitude ($\beta=0.65$) on behavioral goals is greater than advertisement recognition ($\beta=0.58$) on behavioral goal.

Discussion

The research results show that advertisement recognition and advertisement attitude have positive influence on fans' behavioral goals. Apart from that, as the research of Sengupta & Fitzsimons (2000) claims that advertisement effectiveness has positive influence on pursuit willingness decision. What's more, from the effectiveness model framed in the research, it is known that advertisement has relationship with advertisement attitude and the influence of the latter one is the greatest. This result goes the same with "Reciprocal Mediation Hypothesis (RMH)" which scholar Lutz, Mackenzie & Belch (1986) proposed in his research. RMH holds that advertisement attitude (Aad) and brand attitude (Ba) influence each other and their relationship depends on consumers and scenes. Therefore, when consumers contact new products, they have limited knowing on them which causes Aad dramatically influences brand attitudes. On the contrary, if consumers have fully understanding on products and have consuming experience, brand attitude dramatically influences Aad. As what is claimed, when SBL fans watching advertisements, for their familiar with SBL brands, advertisement attitude dramatically influences Aad which further relates to advertisement recognition.

Conclusion and Suggestions

Conclusions

1. Current Condition of Effectiveness of Fans Watching SBL TV Advertisements

SBL fans have mid-high level effectiveness on advertisement recognition and high positive effect in advertisement hobbies field. As for behavioral goals, both loyalty and involvement improvement have mid-high level effectiveness.

2. Effectiveness Model of SBL Fans' Advertisement Recognition and Attitude on Behavioral Goals. The indexes of effectiveness model of advertisement recognition and attitude on behavioral goals and the tested indexes of adaptability of observed data, which are assumed in the research, reach significant level. With SBL fans as study objects, the research assumption that the effectiveness model of advertisement recognition and attitude on behavioral goals is correct.

3. Influence Condition of SBL Fans' Advertisement Recognition and Advertisement Attitude on Behavioral Goals. Advertisement recognition and attitude have positive influence on behavioral goals. From overall model perspective, the joint explanatory power of advertisement recognition and advertisement attitude on behavioral goals is 56%. As for the influence on behavioral goals, advertisement attitude is greater than advertisement recognition.

Suggestions

1. The results shown that TV advertisements broadcast in this season have positive influence on fans' advertisement recognition and advertisement attitude. Thus, it is suggested that in the future TV advertisements, one should keep TV advertisements. What's more, games and league thoughts should be melted into advertisements and emotional links with fans should be established in order to improve fans' involvement.

2. The factor of fans' advertisement attitude is one significant factor in the effectiveness model. As advertisement attitude is influenced by brand attitude, leagues and basketball groups should dedicate actively to image promotion and maintenance of league brand value in order to bring about fans' loyalty and improve their consuming levels.

References

- Li Yilun (2005), "*Research on Impact on the Cross-strait Advertising Requirement and Media Type to Advertising Effectives*", Changhua County: Da-Yeh University, Institute of Careers Management, unpublished master's thesis.
- Sun Chuanshian (2006), "*SBL Closed-door Meeting, Basketball Society and Basketball Groups Reached a Consensus, Sweet Potato Vine Sports*", Data Source: <http://sports.yam.com/show.php?id=0000071837>
- Hung Huangjia (2003), "*Reflections on Mass Media and Sports' Commercialization*", Taitung University, Journal of Sports, I Volume, 211-223.
- Liu Meiqi (2000), "*Contemporary Advertising - Concepts and Operation*", New World Library .P47.
- Jiang Mengneng (2006), "*Interference Effect of the Relations between Product Involvement Degree on Advertising Endorser's Credibility and Consumer's Purchase Intention-Case Housing and Shampoo Market in a Chinese Region*", Changhua County: Da-Yeh University, Institute of Careers Management, unpublished master's thesis.
- Huang Hengxiang (2006), "*Research on Advertising Effect Positive of SBL Super Basketball League*", Journal of Sports and Leisure Management, 3(2), 19-31.
- Zhang Qiongyin (2005), "*Research on the Effect of Insurance Companies' Television Advertising*", Feng Chia University, Institute of Insurance unpublished master's thesis.
- Su Liting (2005), "*Research on advertising effectiveness of Ambush marketing and sports sponsorship-Case Taiwan's TV Media during the Athens Olympic Games*", Taipei: National Taiwan Normal University, Institute of news, unpublished Master's thesis.

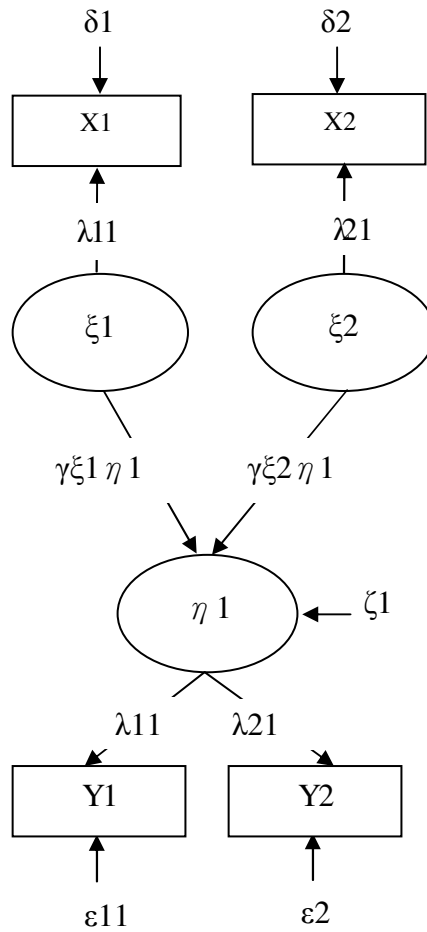


Figure 1: Assumed Model of Influences of Advertisement Recognition and Attitude on Behavioral Goals

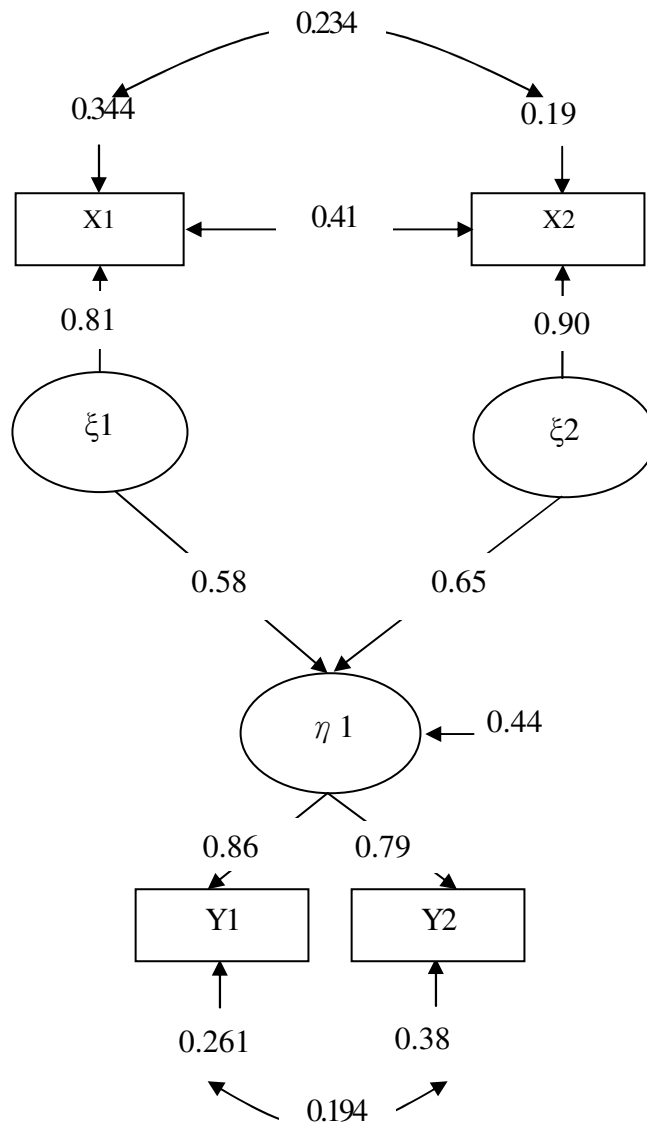
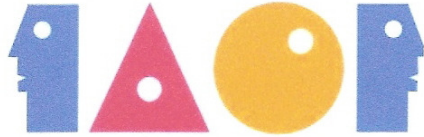


Figure 2: Revised Model of Intluence of Advertisement Recognition and Advertisement Hobby on Behavioral Goals



BROAD PERSPECTIVE AND FRAMEWORK OF QUALITY
OF WORK LIFE

Dr. Pranee Chitakornkijsil
Graduate School of Business Administration,
National Institute of Development Administration (NIDA), Thailand.
wayne.s@nida.ac.th

Abstract

In this study, quality of working life is considered. Then, we examine several authors' theoretical viewpoints, followed by various aspects of quality of work life issues, such as fair treatment for employees, working time, collective bargaining, the roles of employees, and social responsibilities of the organization. Then, mass consumption and productivity are addressed, followed by socio-cultural and economic factors. Moreover, we discuss quality of work life in light of current legislation. Finally, problem solving for quality of work life problems and productivity improvement are discussed.

Key Words: Board Perspective, Quality of Work Life

Board Perspective and Framework of Quality of Work Life

There is currently a world-wide interest in the problems of quality of working life, which would appear to indicate a certain awareness and concern at the international level.

Quality of Working Concept of Life and Term

The concept of “quality of working life” emerged within the industrialized nations. Quality of life has various definitions, such as the “humanization of work”, “improvement of working conditions”, “workers protection”, “work environment improvement”, and “democratization of the workplace”. In broad terms, the quality of working life concerns hours and wages, benefits, work environment, services, career development, and human relations, which is relevant to worker satisfaction and motivation, work ethic, work conditions, satisfaction, as well as managerial concerns about efficiency of output. Quality of working life may mean the positive “value” of a job as it affects the workforce situation, which serves as an essential determinant of workforce productivity and satisfaction during the period of sustained economic growth by improving living standards and educational levels of the workers.

1. “Working life” means both on-the-job and off-the-job lives of all workforce members within their lifetime. An individual receives from their association with a company both materially and in non-materially.

2. Initiatives for improving the quality of working life are derived freely from both labor unions and management. Joint efforts and regular consultations by both parties seem also very common.

3. It is clear that an examination of working life continuously expands the scope of labor issues. This issue requires an increasingly greater degree of attention and resources allocation. Therefore, problems of the quality of working life constitute both basic and higher order issues.

4. Both the labor union and management representatives participate in creating substantial improvements in their industries within a short time.

5. Improvements in the quality of working life refer to mutual interest by both labor union and management representatives, both relationships of harmony and confrontation.

Authors' Standpoints

In addition, leaders in government, management, and labor positions will find this study useful as a tool to aid in carrying out their work. Often businesses that were once competitive have finally turned co-operative in order to offer meaning to the population in each society. Because of existing economic, political, social and cultural conditions, differences among societies result in widely varying degrees of problems in the quality of working life.

Various Aspects of Quality of Work Life Issues

Quality of Work Life Issues

In the beginning, we considered some of the main problems of the issue of quality of working life. Firstly, working life issues concern conditions such as occupational safety and length of time working. Secondly, it concerns workers' needs for justice at the individual level within organization, fair treatment at work, and large groups within society. Thirdly, it concerns the influence of decisions on worker alienation due to powerlessness in decision making. Fourthly, it relates to personal growth of the workforces occupation and the challenge of work content. Eventually, it deals with worker's family and society. The issues above require national legislation and policies, management initiatives and collective agreements, and management initiatives. Workers' values and expectation may differ among nations. As well, in most industrialized nations, the issues which are first tackled by legislation concern occupational safety and the length of working time.

Moreover, occupational health and safety at work is clearly demonstrated in new regulations and standards in nearly all industrialized nations. From developing technologies, new products and new risks emerge, and consequently new rules are established. Noise, fumes, heat, etc. are inevitable attributes of work in industry. As a consequence, labor unions and laborers negotiate with employers for some monetary

recompense for the nuisances of the work environment. Certainly the augmenting comfort of home life makes the workforce more conscious of the obsolescence of the industrial working environment, due to technological changes. Thus, permanent readjustment of the rules is required. New regulations should be imposed upon employers and matched with sanctions. Sanctions and inspections should be imposed by the workforce and their representatives in order to prevent accidents from happening and to increase safety, as well as to improve the work environment. These can be demanded through legislation and collective agreements.

Fair Treatment for Employees and Working Time

Additionally, more paid holidays and vacations are a way to reduce working time. Many nations have enacted legislation providing for longer holidays. Moreover, there are collective agreements in all industrialized nations demanding for more time for private life and more leisure. However, these will not necessarily prevent workers from losing their jobs or from being injured on the job. More than that, grievance procedures allow employees to protest against any injustice done to them. During work, individuals in the workforce do not, nor should they, belong completely to the company. Furthermore, the notion that discrimination ought not to be allowed in the field of employment is widely recognized at the national and international levels; discrimination based on race, sex, color, political opinion, religion, social origin or

national extraction. In France, a law instated on December 1972 requires that “all employers must guarantee for the same work or for work of equal value” equality of pay for the female and male workforce. In fact, wage differentials between women and men in many industrialized nations grow narrower each year. However, employers always claim that some jobs have special difficulties and that the work involved in jobs held by men is more demanding. Protection against the undesirable effects of night work ought to be extended so as to be the same for women and men.

Collective Bargaining and the Role of Employees

Moreover, one form of workforce participation in decision making can take place through the use of company boards. Labor union can gain useful information and use board representation to support the demands for ameliorating working environments, or to discuss wage problems and personnel issues. Management and owners can retaliate by transferring decisions to persons other than the board or by holding informal meetings of the board, to which employees’ representatives are not invited. Management labor joint consultation systems in Japan show that changing values and conditions of the Japanese workforce have stimulated their interest in all aspects of workforce participation in management.

Besides, the reevaluation of scientific management is also important. The concept of scientific management determines whether work methods are too

complicated. In plants, specialists are able to define the “best practice” that the workforce must follow. Moreover, the more simple and short cycled the tasks, the greater the chances of their being performed in a correct method. The economic and technical efficiency of the system seems to be a well-established fact. Management becomes progressively aware that new issues are taking shape. Full employment can make the workforce less eager to take just any job that happens to be at hand. Young workers have a higher level of education than before. They demand more from work and are not ready to be treated in the old authoritarian method. Recently, new aspirations and needs have emerged, and along with it has come worker dissatisfaction.

Social Responsibility of an Organization

Moreover, difficulties associated with the implementation of changes are interesting to examine. Many difficulties often occur during the introduction of new forms of work organization. The level of compensation offered to workers is one of the more critical problems. The appraisal implications of awarding different pay rates can stir strong emotions in workers who work closely with each other. There needs to be consistency. Moreover, labor unions have their own goals, values, and strategies about the organizational changes. Union pressure is able to bring about improvements. Collective bargaining concerns the antagonistic power relation which

exists between management and the workforce. Collective agreements come about, which regulate worker classifications, wages, promotions, transfers, lay-offs and so on.

Furthermore, working life takes place in an organizational framework. The business responsibility of management ought to be of some concern to the workforce. In various industrialized nations, pressure has been exerted upon by different groups, such as the workforce, environmentalists, and customers, to make them more aware of their responsibility to laborers, consumers, society, government, and the consequences of production. Of course, governments have the possibility of establishing interdictions and rules. Much discussion has taken place, especially in the academic world, concerning corporate social audits. Concerning the quality of working life, enterprises should evaluate the impact of their policy by measuring the satisfaction of the workforce through information about turnover and absenteeism, and attitude surveys about job satisfaction, working conditions, accidents at work, wages, hourly wages, and the length of paid vacations.

The quality of work life also concerns work, leisure, and family. In Japan, most managers decrease their vacation period voluntarily in order to give more time to their organization. But as far as the workforce is concerned, they are not involved to such an extent; free time is part of their quality of working life. They prefer to use it with

their family or in leisure activities. Various large enterprises commit to providing workers with more opportunities for leisure by inviting laborers to spend time with their families during enterprise-sponsored activities, or organized trips to foreign countries. Leisure is highly dependent upon the amount of free time available. Trips are possible only when there is a long period of paid vacation saved up. Other activities require shorter periods, like weekends offered as rewards for seniority. There certainly is a relation between the nature of leisure and the nature of the work performed.

More than that, quality of work life concerns work, class, and social status. Jobs have a social status, and a prestige. The social status of a job can be expressed by certain symbols: a private office, nice chairs, and desk, etc., which can show the extent of inequality. Japanese managers work together with their subordinates and make team decisions.

Furthermore, quality of work life concerns advancement in a career, which could mean anything from the life cycle and work, a higher income, more power and more prestige from younger workforces. Career patterns and promotion criteria differ from one nation to another. In Japan, income is augmented with age, which is given by the length of service, so far as the permanent workforce in government, and in medium and large enterprises is concerned. As well, annual increments apply to

everyone. Western nations give more weight to prior formal training, which affects the development of a career. There is an effort to rationalize promotion standards in the west. For the production workforce, seniority is a very widespread criterion in the United States. For engineers or managers, ability and efficiency are the criteria mentioned explicitly.

There are periods in a life cycle: From school to work, from young adult to marriage, then middle age, children, the years before retirement, and finally reaching old age. Quality of working life ought to allow for some work adaptation to the specific demands of each phase. Awareness of the life cycle is an essential concept to the quality of working life in Japan. For younger workers, some feel that they are wasting their time and would like to leave and enter working life because their school program has not suitably prepared them for work. The possibility for the workforce to go back to general education or vocational training exists in various nations (e.g. France, the United Kingdom, and the Federal Republic of Germany). For workers who have grown older, they are less and less motivated to follow training programs. For this period of life, some issues emerge concerning the obsolescence of skills and with the difficulty of creating new skills. Often, the workforce of this age is transferred to jobs requiring less skill and less prestige, as well as offering a lighter

workload. The end of the working life cycle arrives normally with retirement. More and more, the workforce now retires at an earlier age, and less willingly.

The Quality of Work Life and Productivity Improvement

Organizational changes lead to augmentation in the quality of work life and productivity. In this regard, augmented task autonomy may result in greater workforce satisfaction. Changes in information can lead to a positive outcome, such as the way members react to work improvements. Understanding that organizational change processes involve the dynamics of change is important for manipulating any action requiring new forms of organizational behavior. Understanding change processes supports the know-how to implement a strategy effectively. Findings about quality of work life involve attitudinal measures, for example, involvement, job satisfaction, and morale, as well as the satisfaction of employees' needs regarding working hours and fringe benefits. Participative management is a channel of augmenting workers' involvement in the decision-making processes directly affecting their work lives. Group decision making is an effective channel for changing a workforce's behavior. Group decisions can lead to increased worker satisfaction and productivity as well as motivate a workforce to remain and participate in the organization, and for coordinating individuals' behavior around a common objective. Participative management can support work improvement. Participative management

can gain commitment from workforce members even through planning the change.

Participative management is best for an organization whose members are trustworthy, high in openness and risk-taking behavior, and who have strong work methods and quality standards. Participative management is an important approach for improving work. For example, technology, characteristics of a workforce, cultures, and organizational settings can encourage improvement in quality of work life.

More than that, labor members have participated in intradepartmental teams, cross-functional teams, and even cross-company teams. They have assumed full responsibility for self inspection, and self control. They become members of true self-directed work teams. The workforce is trusted to also know how to improve performance and to change processes for the better, improving both the efficiency and the effectiveness of the process. Workers also can be trusted to understand how to plan for quality. They understand who their consumers are, and what the consumers want, need, and expect. They also understand how to design new goods and services to meet these needs, and how to develop and apply the necessary quality measurements for achievement. Finally, they know how to develop necessary work processes; and how to continuously improve the processes. In conclusion, they know and use daily quality planning, quality improvement, and quality control.

Furthermore, within the Taylor system, productivity has top priority. There is intense pressure on production supervisors and workers to meet productivity goals. This pressure is met by shipping products, which do not conform to quality goals. Nowadays, a quality engineer begins working with the workforce one at a time. They define each critical step of the worker's process. They work together to decide on the appropriate measuring instrument and the correct measurement. Together, they develop clear definitions of each quality characteristic, and interpret the results and methods to measure these characteristics. They also develop clear procedures for taking action when the results are out of control. Actions of supervisors are transferred to workforces, including process planning, work assignment, adjusting to changing needs, continuous improvement, recruitment of new employees, review of performance, and maintenance of discipline.

Recently, teams of workforces have visited crucial consumers to learn more about the consumers' use of the product, in order to redefine the consumers' requirements and specifications and bring this new information back to the plant. An enterprise transfers to the workers certain critical responsibilities for dealing with relations with consumers. To provide such improved consumer service, it is necessary for workforces to learn new skills in order to avoid many possible errors and to perform multiple tasks. The self-supervising concept provides workforces with a

sense of comprehension and ownership, which contributes significantly to the quality of work life. Workforces are extensively trained to perform multiple tasks in order to provide flexibility in assignment. They are trained to be competent in all the processes of quality, which include planning, improvement and control. Quality planning is often performed as a team, normally a cross-functional team, in order to develop new production, services, or business processes; sometimes, there is a need to revise plans, as well. For each quality project, the team establishes process measurements and sets the objectives for the next year. These projects, guidelines, objectives, and team responsibilities become part of the annual business plan or quality plan. Thus, the new cross-functional quality projects lead to significant improvements in operations. Nowadays, improvements in working conditions are an objective of the government and of employers and labors for a long time to come. Improvements in working life are able to be achieved by the determined efforts to improve productivity, quality, and subsequently profitability and competitive strength.

Framework of View Points of Quality of Work Life Issues

Labor issues arise as a result of subjective judgment of a human situation that concerns work, and a worker's crucial evaluation of their external reality in the sense that it can adversely affect the well-being of working people. Individual labor issues lose their personal significance when they become the basis for action in politics, by

management or by labor movements. They are grouped by common denominators such as age, sex, occupation, income, etc. Labor unions have time conflicts of individual demands of members at the heart of its goals. Moreover, institutional decisions on labor issues and their solutions will not take effect unless they are based on real issues faced by the individual workforce in their working lives. As always, labor issues are perceived only in terms of improvements in material or physical conditions of work, or in environment and other related areas. Government, management, and labor representatives find it easier to negotiate quantifiable benefits and resources. Work conditions may reduce individual complaints from within the workforce by those whose needs are satisfied by the new arrangement. The argument is also useful to comprehend the situation when different reactions occur as a response to identical stimulus. Workers in each nation evaluate the same new stimulus in different ways. The different reactions do not stem from ignorance, or from their past experience.

Problem perceptions are the basis for problem-solving. Frequently, issues are imagined on the basis of the experiences of a limited number of industrialized countries. Often, various managers from such nations are not sufficiently informed about available alternatives, even if they admit intellectually that any alternative is not best. When there is a wide gap between local and expatriate management, expatriate

managers are seldom challenged effectively by their counterparts in the host nation, and the latter is not able to offer satisfactory alternatives. Very few people on either side realize that the experiences formerly undergone by the advanced industrial countries, which eventually requires a considerable degree of trial and error. Various problem solving skills and institutions are not able to simply be transferred from one culture to another. Labor issues are one such area where the application to procedures and methods from one nation will be only of limited value to each particular society. The problem solving process affects quality of working life problems.

Mass Consumption and Productivity

Nevertheless, quality of work life also concerns mass consumption and productivity. Work produces goods and services that a society requires for its citizens' consumption and capital formation. While capital formation and consumption are in some ways trade-off relations, only the capital investment made in manpower and production equipment can augment society's future capacity for wealth generation. Improved productivity is the key to the realization of higher self-sustaining growth and living standards of a country's economy. Therefore, the implied goal is a continuously higher economic welfare value for each citizen. Improved productivity, innovation, savings, investment, and export are real values. Such personal qualities as technical supremacy, creativity, adaptability, achievement and organizing ability may

be added to quality work life. Society begins to give greater importance to the economic aspect of human life.

For quality of work life, work is an inner experience. Work imposes time-place restrictions on the freedom of workers, it dictates a series of mental and physical activities regardless of workforces' preferences, and at the workplace it imposes them of the freedom they have in private life. Workers continue to search for the meaning of work, as they must have for the meaning of life itself. To many workforces, money seems to be the most important concern. To thoughtful workforces, work is something beyond a mere means to earn a comfortable living. Such workers seek a sense of fulfillment through their experience off and on the job, not only to satisfy immediate needs but also to realize long-term objectives. In more immediate situations and in the short-term, the workforce may perceive specific goals that they aspire to fulfill through their work experience. Some seek human relations to their fellow workers and supervisors; some wish to find the atmosphere of their family life in their workplace; some look for challenges in their work,; other seek variety and complexity in work content which best suit their mental capacity; while others wish undisturbed life while engaged in work. Work in society-related goals sought by labor at work.

Social, Cultural, and Economic Factors

In addition, quality of work life also deals with social, cultural and economic factors. Labor issues are closely linked with stages of economic development. No nation is able to wholly avoid labor issues in the process of economic development. People then begin to take more of an interest in their roles as consumers and producers. Then, workforces' interests turn towards a search for meaning in their work, each workforce seeking a sense of fulfillment in their own way. In consequence, through collective bargaining or political participation, workforces' representatives will have established some influence over the decisions affecting conditions of work and life. Economic development brings about higher standards of living and augments the opportunity for cultural participation. In developing economies, labor issues are likely to show substantial differences among industries. The rates of improvement in productivity and growth vary from one industry to another. Governmental policies are also important in eliminating the concentration of specific issues in special industries. Nevertheless, the different growth rates in industries generate qualitative differences in labor issues in short-term problems. Fast-developing industries have young workers who are well-educated with high aspirations, who do not tolerate grievances which they believe are able to be solved reasonably well within the context of their national economy. Such industries also create trends in innovations to meet new labor issues. Management is likely to be sensitive to new worker needs and flexible in resource

allocation. Economic development augments issues in the field of labor and work. Here we give a forewarning in that industrial relations ought to be prepared to face new issues when continued economic growth is forecasted. Development is often a desire of salary and wage earners. Economic recession brings unemployment. There are some workforces who are forced to take a cut in income, which increases anxieties about the future. Obviously, political factors play a part, and technological and economic considerations play an even more important role. Decisions on workforce issues become localized as policy-makers tend to reflect the issues of the people in a given situation. In conclusion, we would stress the point that in most cases, problems of the quality of working life are not able to be dealt with singularly.

Quality of Work Life and Legislation

Many nations have long histories of legislation designed to improve the quality of work life. The United States has safety laws, wage and hour laws, pension laws, and laws governing the certification and behavior of labor unions. However, the United States lacks laws dealing with meaningfulness of jobs, and the opportunities people have for personal development and growth. A few European nations have passed laws dealing with these problems to deal with measurement issues. In legislating quality of work life, government tries to legislate a better quality of work life unless the government judges that essential aspects of work life will not improve

for many people. Little evidence shows that improving the quality of work will augment profitability.

After the Second World War, economic development and growth became a central problem especially in less developed countries where widespread poverty had been a prime issue. This pervasive poverty has generated a humanistic consideration for economic development. Less developed nations have surplus and cheap labor. Nation can reduce unemployment and underemployment to increase the productivity of labor in the agricultural sector, and to supply cheap labor to the industrial sector. Contrarily, employment opportunities have been generated in two ways: one is to augment agricultural productivity with better and more inputs by assuming that an augmentation in productivity will lead to the expansion of demand for labor, and to expand non-farm job opportunities for people through either rural urban migration or industrialization.

Problem Solving For Quality of Work Life Problems

Often, management looks at issues such as worker absenteeism, high turnover, high waste rate, and difficulty in recruiting workers for production jobs as a sign that worker satisfaction is low, or that work not is as essential to them as their private lives. In the same way, management perceives potential sources of labor satisfaction as additional opportunities to increase management effectiveness. Earlier, scientific

investigations provided evidence for the need to improve the work environment and the quality of working life. In various nations, the quality of working life problem has acquired a political flavor. The quality of working life is an important political item in a society where the electorate consists largely of salary and wage workers.

Discrepancies may develop between what workforces need and what labor unions can acquire through negotiation.

Eventually, labor unions are placed in a dilemma when management takes initiative in improving the quality of working life. Nowadays, costs per head tend to be augmented as each society experiences sustained economic growth and better conditions of work. Government must find ways to accommodate the needs of workers who constitute one of a nation's most important power groups.

Management's interest in the quality of working life ought to be understood first as an investment question. A financial investment in the quality of working life is the minimization of negative consequences that may result from non-investment. An investment decision into the quality of working life is important when negative consequences are clearly associated with non-investment decisions, and to maintain productivity.

When a decision of social responsibility is at hand, a quality of working life decision depends mainly on demand of social opinions and norms. Some managers

think that simply following the minimal legal requirements is the best answer.

Investment in quality of working life is more likely to take place when the economy is expanding. To meet the new challenges in international trade, management must be more concerned with costs and productivity. Government also must make decisions on resource allocation for improving the quality of working life. Normally, a labor ministry is designed to deal with employment security, labor relations, protection of minors and women, occupational safety, and labor standards. Once, lawyers, engineers, accountants and architects practically decided on the design of change under a climate of technological determinism. Nowadays, the involvement of those who will be affected by the change is gaining increasing importance in various industrialized nations. Substantial cultural differences seem to exist among nations in the way experts share work with non-experts. In some nations, certain specialists receive much higher financial rewards than do their functional equivalents in other nations. Relationships between non-experts and experts seem conditioned by culture and by the degree of educational equality and socio-economic status.

The last stage concentrates on the implementation of the programme designed to resolve specific quality of working life issues. Planned changes are solved and the cause of dysfunction can be removed. Management policies may be limited due to legislation or collective agreement, but various alternatives are available. We predict

important developments for the quality of working life and related problems in the future. Changes in quality of working life are necessary in order to make additional changes in the rest of working conditions.

Conclusions

Achieving a good quality of work life is a major task for management.

Management from all institutions are responsible for the impact of their legitimate activities on the workforce and on the physical and social environment. Productivity is considered to be working hard; working harder than the duties given to us by our superiors. Quality refers to carrying out a job well, and fully. Social responsibility demands that businesses are responsible for social issues, social problems, political and social goals, as well as society's problems. But such social responsibilities are also being demanded of non-business organizations in society. Government, hospitals, universities, societies, historians, and physicists demand business responsibility for society's problems and ills. Quality of work life also demands government's ability to solve major social problems. People now need to be shown social responsibility from businesses. Besides, it is management who takes over the succession of major social problems and issues dealing with the company when they are introduced into the leadership position . It is demanded that the quality of work life becomes the business of business.

Measuring the results of quality of working life can be undertaken as follows:

- Quality: number of complaints from customers; patient care; waste rate; damage rate; quality of maintenance; and average rate of rejects.
- Costs: overheads; clerical costs; manufacturing costs; personnel costs; and direct labor costs per unit.
- Productivity: worker effectiveness; reduction in inspection time; success in recruitment of personnel; initiative in seeking new business; rate of operation; machine efficiency as percentage of standard; reduction in amount of record keeping; time spent on non-cycle activity; and reduction in balance delay time.
- Attitudes: internal motivation; general satisfaction; satisfaction of growth needs; involvement; satisfaction with the company; satisfaction of foreman; satisfaction with working conditions; satisfaction the work group; satisfaction with job security; satisfaction with pay; morale; interest in work and attitudes of labor unions and management.
- Withdrawal from work: absenteeism; labor turnover; early departure; late arrival; and employee trips to the health centre.

Concerns of the quality of working life in its broadest sense should substantially strengthened contributions experienced by nations not studied adequately.

References

- Allen, Kathleen R., 1991, *Growing and Management an Entrepreneurial Business*, Boston: Houghton Mifflin Co.
- Ann E Tenbrunsel, David m Messick., 1999, "Sanctioning System, Decision Frames, And Cooperation," *Administrative Science Quarterly*. Ithaca: Dec. Vol.44, Iss. 4; p. 684.
- Ann Langley., 2000 "Legitimacy in Public Administration: A Discourse Analysis," *Administrative Science Quarterly*. Ithaca: Mar. Vol.45, Iss.1; p. 177.
- Anonymous. Letters to the editor, 1997, *Harvard Business Review*. Boston: Sep/Oct. Vol. 75, Iss. 5; p. 190.
- Badaracco, Joseph L Jr, Webb, Allen P., 1995, "Business Ethics: A View From the Trenches," *California Management Review*. Berkeley: Winter. Vol. 37, Iss. 2; p. 8.
- Cappelli, Peter., 1995, "Is The "Skills Gap" Really About Attitudes?," *California Management Review*. Berkeley: Summer. Vol. 37, Iss. 4; p. 108.
- Cole, Robert E., 1992, "Work and Leisure In Japan," *California Management Review*. Berkeley: Spring. Vol. 34, Iss. 3; p. 52.
- Cascio, Wayne F., 1998, *Managing Human Resources: Productivity, Quality of Work Life, Profits*, Boston: Irwin McGraw-Hill, 5th ed., International ed.
- Certo, Samuel C., 2000, *Modern Management: Diversity, Quality, Ethics & the Global Environment*, Upper Saddle River, N.J.: Prentice Hall., 8th ed.
- Cohen, Don, 1946-, Prusak, Laurence., 2001, *In good Company: How social Capital Makes Organizations Work*, Boston, Mass. : Harvard Business School Press.
- Collins, James C, Porras, Jerry I. 1996, "Building Your Company's Vision," *Harvard Business Review*. Boston: Sep/Oct. Vol. 74, Iss. 5; p. 65.

- Cummings, Thomas G., Molloy, Edmond S., 1997, *Improving Productivity And The Quality of Work Life*, New York : Praeger.
- Delamotte, Yves., Takezawa, Shin-ichi, 1984, *Quality of Working Life in International Perspective*, Geneva : International Labour Office.
- Forest L Reinhardt., 1998, "Environment Product Differentiation: Implications For Corporate Strategy," *California Management Review*. Berkeley: Summer. Vol. 40, Iss. 4; p. 43.
- Ellen H Moskowitz, David T Nassef., 1997, "Integrating Medical and Business Values in Health Benefits Management," *California Management Review*. Berkeley: Summer. Vol. 40, Iss. 4; p. 43.
- Galbraith, Craig S, Merrill, Gregory B., 1996, "The Politics of Forecasting: Managing The Truth," *California Management Review*. Berkeley: Winter. Vol. 38, Iss. 2; p. 29.
- Galliher, John F., Mills, C. Wright (Charles Wright), 1916-1962. Gouldner, Alvin W., Liazos, Alexander., Thio, Alex., Schervish, Paul G./ Hughes, Everett C., Schwendinger, Herman., Schwendinger, Julia., Chambliss, William J. (William Jones), Griffin, Susan., Hall, Jacquelyn Dowd., Greenberg, Jack., Himmelstein, Jack., Smith, Dwight C., Alba, Richard D., Leonard, William N., Weber, Maevin Glenn., Farberman, Harvey A., Vaughan, Diane., Calhoun, Craig., Hiller, Henryk., Minz, Morton., Michalowski, Raymond J., Kramer, Ronald C., McCormick, Albert F., Szasz, Andrew., Dowie, Mark., Calavita, Kitty, 1991, *Deviant Behavior and Human Rights*, Englewood Cliffs, N.J.: Prentice.
- Heilbrunn, Jeffrey., 1995 American Marketing Association. *Marketing Encyclopedia: Issues and Trends Shaping the Future*, Chicago: American Marketing Association; Lincolnwood, Ill., NTC Business Books.
- Heisler, William J., Houck, John W., 1997, *A Matter of Dignity : Inquiries Into The Humanization of Work*, Noire Dame, Ind. : University of Notre Dame Press.
- Howard, Ann, Wilson, James A., 1982, "Leadership in a Declining Work Ethic," *California Management Review*. Berkeley: Summer. Vol. 24, Iss. 4; p. 33.

- Guerrier, Yvonne., 1995, *Values and the environment: A social science perspective*, Chichester; New York : Wiley.
- International Productivity Congress (1991 : Bangkok), Sugiura, Hideo., Godfrey, Blanton., Boulden, George P., Huh, Shin-Haeng., Tokman, Victor E., Gelinier, Octave., Billimoria, R. P., Fujiwara, Iwao., Schregle, Johannes., Lau, Robert., Pirasteh, Hossein., Bechera, A.K., Mohanty, R.P., Roa, Vaska Raghavendra., Suri, G.K., Ogunlana, Steph O., Olomolaiye, Paul O., Saupin, Marc G., Mah Lok Abdullah., Man, John., Jain, T.C., Sharma, R.N., Chaisak Saeng-Xuto., Jain, U.C., Kallevig, Anthony., Carlos, Cris P., Chira Hongladarom., Bapat, S.G., Asian Productivity Organization., Thailand Management Development and Productivity Centre, 1991, *Better Quality of Work Life Through Productivity*, [Tokyo] : APO.
- John M Jermier., 1998, "Introduction: Critical Perspectives on Organizational Control," *Administrative Science Quarterly*. Ithaca: Jun. Vol. 43, Iss. 2, p. 235.
- John T Gourville, HBR CASE STUDY : Holding Fast, *Harvard Business Review*. Boston: June 2005. Vol. 83, Iss. 6, p. 35.
- Joseph L Badaracco Jr., 1999, "How Free are Free agents?," *Harvard Business Review*. Boston: Nov/Dec. Vol. 77, Iss. 6, p. 169.
- Kanter, Rosabeth Moss., 1991, Transcending Business Boundaries: 12,000 World Managers View Change, *Harvard Business Review*. Boston: May/Jun. Vol. 69, Iss. 3; p. 151.
- Kolesar, Peter J., 1993, "Vision, Values Milestone: Paul O' Neill Starts Total Quality at Alcoa," *California Management Review*. Berkeley: Spring. Vol. 35, Iss. 3; p. 133.
- Lawler, Edward E., Nadler, David A., Cammann, Cortlandt., 1980, *Organizational Assessment : Perspectives on The Measurement of Organizational Behavior and the Quality of Work life*, Chichester: Wiley.

- Linda Klebe Tervino, Gory R Weaver, David G Gibson, Barbara Ley Toffler., 1999, "Managing Ethics and Legal Compliance: What Works And What Hurts," *California Management Review*. Berkeley: Winter. Vol. 41, Iss. 2; p. 131.
- Lutic, Margaret A., 1996, *Who We Could Be at Work*, Boston : Butterworth-Heinemann, Rev. ed.
- Lundberg, Carig C., 1996, "The Unbounded Mind: Breaking the Chains of Traditional Business Thinking/ Framebreak: The Radical Redesign of American Business," *Administrative Science Quarterly*. Ithaca: Sep. Vol. 41, Iss. 3; p. 532.
- Miroff, Ian I., "Crisis Management and Environmentalism: A natural Fit," *California Management Review*. Berkeley: Winter. Vol. 36, Iss. 2; p. 101.
- Mondy, R. Wayne, Premeaux, Shane R., 1993, *Management : Concepts, Practices, and Skills*, Boston : Allyn & Bacon.
- Nicholas G Carr, 1999, "Being Virtual: Character and the New economy," *Harvard Business Review*. Boston: May/Jun. Vol. 77, Iss. 3; p. 181.
- Patricia Yancy Martin, 1999, "Women's Studies and Business Ethics: Toward a New Conversation," *Administrative Science Quarterly*. Ithaca: Sep. Vol. 44, Iss. 3; p. 633.
- Peace, Sheila M., Bytheway, Bill., Wilkin, David., Qureshi, hazel., Hughes, Beverley., Fennell, Graham., Challis, David, Darton, Robin., Fairhurst, Eileen., Kellaher, Leonie., Willcocks, Dianne., Bury, Michael., Holme, Antheo., Gearing, Brian., Dant, Tim., Dutler, Aln., Jefferys, Margot., Osborn, Averil., British Society of Gerontology., 1990, *Researching Social Gerontology : Concepts, Methods and Issues*, London : Sage in association with the British Society of Gerontology.
- Posner, Barry Z., Schmidt, Warren H., 1992, "Values and American manager: An Update ," *California Management Review*. Berkeley: Spring. Vol. 34, Iss. 3; p. 80.

- Puffer, Sheila M, McCarthy, Daniel J., 1995, "Finding the common ground in Russian and American business," *California Management Review*. Berkeley: Winter. Vol. 37, Iss. 2; p. 29.
- Russo, Michael V, 1999, *Environmental Management : Readings and Cases*, Boston: Houghton Mifflin Co.
- Stoddart, I., Falciola, Kristine, 1986, *Conditions of Work and Quality of Working life: a Directory of Institutions*, Geneva: International Labour Office, 2nd rev. ed.
- Takezawa, Shin-ichi, 1982, International Labour Office. *Improvements In The Quality of Working Life in Three Japanese Industries*, Geneva : International Labour Office.
- Tarun Khanna, Krishna Palepu, 1999, "The Right Way to Restructure Conglomerates in Emerging Markets," *Harvard Business Review*. Boston: Jul/Aug. Vol. 77, Iss. 4; p. 125.
- Trowbridge, Alexander B., 1985, "Attracting the Best to Washington," *Harvard Business Review*. Boston: Mar/Apr. Vol. 63, Iss. 2; p. 174.
- United Nations Development Programme., 2001, *Human Development Report 2001: Making New Technologies Work for Human Development.*, New York, N.Y. : Oxford University Press.

A Study of Taiwanese College Teachers' Acceptance of Distance Learning

Chih-Hsing Wang

Office of General Education, TransWorld University, Yunlin 64043, Taiwan
chihhsingwang@yahoo.com.tw

Wen-Liang Liu

Department of Marketing Management, TransWorld University, Yunlin 64043,
Taiwan

Meng-Chun Tseng

Department of Tourism and Hospitality, TransWorld University, Yunlin 64043, Taiwan

Hung-Sung Tsai

Office of General Education, TransWorld University, Yunlin, 64043, Taiwan

Abstract

The time for a knowledge based has come. With the rapid development of information technology and the Internet, distant education has become an essential aspect in the educational environment. To promote distant learning and education more effectively, an understanding of individual Taiwanese college teachers' continued use of distance learning technologies is imperative. This study intends to grasp teachers' perspectives. Further, we propose a user-friendly model that efficiently explains the distance-learning platforms. This study started out with the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. (2003) and added the perceived sacrifice (PS) viewpoint to construct a decision based model to explain and predict the degree of acceptance of distance learning among Taiwanese college teachers. The subjects of this study are Taiwanese college teachers. Results are shown through the Internet questionnaire survey method, 264 valid questionnaires were returned and were analyzed using the LISREL structural model. The analyses results indicated that (1) Performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) all had positive influence on teachers' intention of using distance learning. Contrary analyses indicated perceived sacrifice had a negative influence on teachers' intention for using distance learning (2). In terms of the moderating effects of gender, the effects of PE, EE, SI, and PS on the behavioral intentions of distance learning were moderated by gender.

Keywords: distance learning, UTAUT, gender, perceived sacrifice

Introduction

As the name suggests, distance learning adopts a non-face-to-face teaching method. The earliest distance learning originated from correspondence education. The development of distance learning has a long history. The definitions that scholars gave to distance learning do not differ much essentially. Moore and Kearsley (1996) defined distance learning as the following: distance learning is planned teaching. Typically, students and teachers are separated by distance. Therefore, they must adopt a specific course design and teaching techniques for particular communication technologies with special organization and administrative design to achieve their educational goals. With the popularity of e-learning, the academic field started to engage in research of this educational style (Agaoglu et al., 2002; Liu, 2002; Ozkul, 2001). Currently, the literature that investigates e-learning is still growing. Therefore, having an in-depth understanding of the factors that impact the e-learning behavioral intentions of Taiwanese college teachers becomes the concerned central topic. E-learning is important and research about teachers' acceptance towards e-learning is still lacking. This study analyzes teachers' behavioral intention of distance learning by an in-depth understanding of the factors that influence teachers' use of distance learning and the interference effect caused by gender.

Based on this explanation, we use an empirical research method and intend to investigate teachers' behavioral intentions for distance teaching through UTAUT using gender as a segmentation variable. This study hopes to achieve the following :

- (1) To understand the factors that affect e-learning behavioral intentions of college teachers.
- (2) To investigate the influence of gender on the path relation of e-learning behavioral intentions.

Literature Review and Hypotheses

The Unified Theory of Acceptance and Use of Technology (UTAUT)

Davis et al. (1989) suggested that the technology acceptance model (TAM) primarily used the influence of external variables' on behavioral intentions. Venkatesh et al. (2003) reviewed specifically related research over the years and discovered that each empirical model had its own characteristics. They integrated the eight models from previous literature including the theory of reasoned action (TRA), the theory of planned behavior (TPB), the technology acceptance model (TAM), the combined model of TAM and TPB(C-TAM-TPB), the extrinsic motivation (EM), the model of PC utilization (MPCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). They further proposed the unified theory of acceptance and use of technology (UTAUT).

The UTAUT model integrated the theories proposed in related literature into four major constructs: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC); with four moderating variables, including gender, age, experience, and voluntariness. The empirical results show that the new framework had an explanatory power as high as 70% for technological acceptance behaviors, which was more effective than the previous eight isolated models. Therefore, this study proposed hypotheses H₁, H₂, H₃, and H₄:

H₁. The e-learning PE does not have a positive influence on behavioral intention.

H₂. E-learning's EE does not have positive influence on behavioral intention.

H₃. E-learning's SI does not have positive influence on behavioral intention.

H₄. E-learning's FC does not have positive influence on behavioral intention.

Perceived Sacrifice

Zeithaml (1988) suggested that the perspective of consumers, perceived

sacrifice referred to the costs that consumers sacrifice or give up to obtain for the use of certain products. This is the same concept as the one proposed by other researchers (Chapman, 1986; Mazumdar, 1986; Monroe and Krishnan, 1985). Baker et al. (2002) pointed out that perceived sacrifice included the cost of perceived time, the cost of perceived efforts, and the cost of perceived psychology. Monroe and Krishnan (1985) considered perceived sacrifice would negatively influence the behavioral intentions of consumers that were consistent with the research results of other researchers (Wen-Liang Liu and Zong-Tai Tang, 2007). Therefore, this study proposed the hypothesis H₅:

H₅. E-learning's perceived sacrifice does not negatively influence behavioral intention.

Gender

Homburg and Giering (2001) suggested that gender had its important function on the understanding consumers' actual consumption behavior. The main reason was that the variables were easily understood and evaluated. In addition, the operations were relatively simple in the field. That is, gender is an important segmentation variable. Previous studies indicated that gender would influence consumer behavior (Jasper and Lan, 1992). Therefore, this study proposed hypotheses H₆₁, H₆₂, H₆₃, H₆₄, and H₆₅.

H₆₁. Gender does not have significant influence on the path relation between PE and behavioral intention.

H₆₂. Gender does not have significant influence on the path relation between EE and behavioral intention.

H₆₃. Gender does not have significant influence on the path relation between SI and behavioral intention.

H₆₄. Gender does not have significant influence on the path relation between FC and behavioral intention.

H₆₅. Gender does not have significant influence on the path relation between PS and behavioral intention.

Research Methods

Construct Evaluation

This study has used a confirmatory empirical research approach. Therefore, we have inspected the research model using questionnaires. The primary research variables of this study included performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived sacrifice. Gender is used as the segmentation variable.

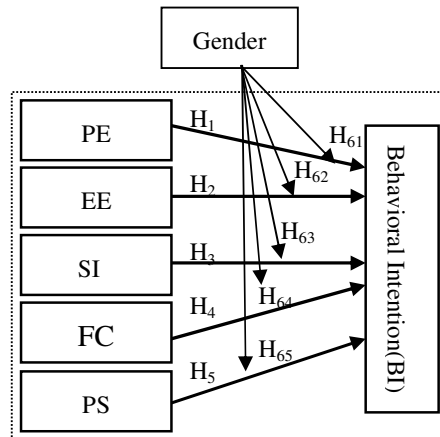


Figure 1. Research Framework

The Measuring Scales

To ensure the content validity, the sources of the research questionnaire survey items are all from previous literature. The questionnaire consists of six major sections, including the subjects' basic information, performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived sacrifice. Performance

expectancy primarily adopts the measuring scale of the UTAUT model developed by Venkatesh et al.(2003). Effort expectancy primarily adopts the TAM measuring scale developed by Davis (1989). Social influence primarily adopts the measuring scale developed by Thompson et al. (1991) and the measuring scale of the UTAUT model developed by Venkatesh et al. (2003). Facilitating conditions primarily adopts the measuring scale developed by the UTAUT model and the measuring scale of the UTAUT model developed by the Venkatesh et al. (2003). As for Perceived sacrifice primarily adopts the measuring scales developed by Teas and Agarwal (2001) and Baker et al.(2002).

Since this study used a confirmatory research approach, each questionnaire item adopts the Likert seven-point scale for evaluation. one denotes strongly disagree, whereas seven denotes strongly agree. The source of the study's questionnaire and its items are indicated in Table 2.

In concern of the integrity of the development of the measuring scale, this study employed experts from five fields who had more than three years of experience using e-learning, to examine the content of the questionnaire. Based on the opinions given by the experts the questionnaire was modified. First, pre-tests of the questionnaires were given to the five experts to examine whether each questionnaire item can convey the actual meaning of the construct. Then, thirty samples were selected from the research subjects to conduct trial-tests. Based on the subjects' opinions, the questionnaires were modified to remove semantic barriers and increase the validity of the content.

Sampling Method

This study primarily investigates Taiwanese college teachers' behavioral intention for e-learning. To effectively contact a wide range of teachers with e-

learning experience, this study adopted the method of using Internet surveys. First, this study randomly selected thirty schools from 164 colleges in Taiwan and sent researchers to investigate teachers that were active in the school's e-learning system. Then, twenty teachers were randomly selected from each school as the subjects of the Internet questionnaires. Afterwards, emails were sent to be used for teachers to fill out Internet questionnaires.

Data Analysis and Results

Descriptive Analysis

The online questionnaire of this study began on January 4th, 2010 and, went until January 25th, 2010. A total of 291 questionnaires were returned. After deleting questionnaires that were

Table 2. Questionnaire Item References

dimension	Questionnaire Item	reference
PE	PE1 : For me, using e-learning is beneficial for the effectiveness of conducting learning activities.	Venkatesh et al. (2003)
	PE2 : For me, using e-learning can increase my efficiency in handling learning affairs.	
	PE3 : For me, using e-learning is beneficial.	
	PE4 : I think e-learning is more convenient than traditional learning.	
	PE5 : Overall, I am satisfied with the effectiveness created by using e-learning	
EE	EE1 : For me, the e-learning usage method is quite clear.	Davis (1989); Venkatesh et al. (2003)
	EE2 : For me, e-learning can be managed with ease	
	EE3 : For me, using e-learning is not difficult.	
	EE4 : I am capable of operating the e-learning system skillfully to engage in all kinds of activities.	
	EE5 : Overall, I think the experience of using e-learning is pleasant.	
SI	SI1 : The majority of people who are influential to me (e.g. my family and friends, my boss and employees, etc.) think that I should use e-learning.	Thompson et al. (1991); Venkatesh et al. (2003)
	SI2 : The majority are the ones I value very much (e.g. my family and friends, my boss and employees) think that I should use e-learning.	
	SI3 : I do not think that the inability of using e-learning would lose contact with the society.	
	SI4 : I think the ability of using e-learning is a social trend.	
FC	FC1 : When I want to use e-learning, I can always go online easily.	Thompson et al. (1991); Venkatesh et al. (2003)
	FC2 : I can easily access the related e-learning activities.	
	FC3 : Once I encounter any difficulty in the use of e-learning, I can quickly employ all kinds of information (e.g. books, friends, the Internet, etc.) to solve the problems.	
PS	PS1 : Using the e-learning service has the problem in security.	Baker et al. (2002) Teas & Agarwal (2002)
	PS2: Using the e-learning service has risks.	
	PS3 : Using the e-learning service requires time to learn.	

BI	BI1 : I would consider using e-learning. BI2 : I hope to have the opportunity of using e-learning.	Davis (1989); Venkatesh et al.(2003)
----	---	---

incomplete, filled out randomly, filled out with extreme answers, and no experiences in using e-learning; the number of valid returns was 264. Among the valid samples, the percentage of interviewees that were men was 52% (138 people) and that were women was 48% (126 people). The number of years of experience with actual e-learning contact was 31 people (11.7%) had no more than two years of experience; 96 people (36.4%) had two to three years of experience; 118 people (44.7%) had three to four years of experience; 19 people had more than four years of experience (7.2%).

The Evaluation Model

This study used goodness of fit of the LISREL 8.51 verification model to conduct the data analysis with default maximum likelihood method to estimate parameters. In using the maximum likelihood method, the data must match with the assumption of multivariate normal distribution. The number of samples cannot be too small. The number should be at least between 100 and 150 for suitable use (Ding et al., 1995). After the invalid samples were removed, the number of valid samples was 264. Based on the suggestions of Bagozzi and Yi (1988) and Nunnally (1978), the four most indicative indicators were selected to assess the evaluation model as follows:

The Reliability of Individual Items

This indicator is used to assess measured variables' factor loading for the latent variables and inspect each variables loading statistical significance. In the factor loading analysis, the significance test was conducted using the t-test. The greater the t value, the stronger the intensity. If the t value is above 1.96, then the result can be considered as significant. Table 3 indicates that the factor loading of individual variables are all above 0.5. All t values are greater than 1.96, which indicates that the measuring quality of the entire questionnaire surveys is excellent. Each item has high

relevance. The study's factor loading is between 0.70 and 0.89, which matches with the suggestive value of Hair et al. (2005).

The Composite Reliability (CR) of Latent Variables

The composite reliability value of latent variables is composed by all measured variable reliability, which indicates the internal consistency of construct indicators. The higher the reliability, the higher the internal consistencies of the indicators were. Fornell and Larcker (1981) suggested the value to be above 0.6. Table 3 indicates that in the evaluation model, each variable's CR is all above 0.6. This study's composite reliability value sets between 0.82~0.88, indicating that the internal consistency of the research model is excellent.

The Average Variance Extracted (AVE) Of Latent Variables

The AVE is to calculate the variance average explanatory power of each measured variable for the latent variable. The higher the AVE, the higher the reliability and the convergent validity of latent variables was. Fornell and Larcker (1981) suggested that the standard value must be greater than 0.5. Table 3 indicates that in the evaluation model, the AVE value (0.59~0.72) is greater than the standard value, 0.5, indicating that the latent variable of this study has good reliability and convergent validity.

Discriminate Validity

Discriminate validity refers to the different constructs. Differences exist between the items that measure these constructs respectively. Based on the suggestions given by Fornell and Larcker (1981), the method of measuring the discriminate validity is that each construct's variance extracted is greater than the square value of the correlation coefficient of the construct and other constructs. As shown in Table 4, all indicators match with the above assessment standard, indicating

that this study's items have excellent discriminate validity.

Table 3. Evaluation Model Analysis

Construct	Items	Factor Loading	Standard Error	t value	CR	AVE
PE	PE1	0.72	0.31	6.42	.88	.59
	PE2	0.75	0.35	7.94		
	PE3	0.74	0.39	7.43		
	PE4	0.71	0.37	6.23		
	PE5	0.70	0.43	6.69		
EE	EE1	0.72	0.36	6.35	.88	.60
	EE2	0.79	0.35	6.47		
	EE3	0.77	0.34	6.63		
	EE4	0.71	0.40	6.79		
	EE5	0.75	0.38	6.57		
SI	SI1	0.75	0.38	8.73	.86	.61
	SI2	0.77	0.35	8.47		
	SI3	0.79	0.34	8.68		
	SI4	0.71	0.39	8.61		
FC	FC1	0.74	0.32	8.93	.83	.63
	FC2	0.76	0.31	8.76		
	FC3	0.75	0.38	8.23		
PS	PS1	0.72	0.37	6.96	.82	.61
	PS2	0.78	0.33	6.63		
	PS3	0.74	0.39	6.46		
BI	BI1	0.89	0.31	9.86	.83	.72
	BI2	0.82	0.27	8.70		

【Note 1】 $CR = (\sum \text{Standardized factor loading})^2 / [(\sum \text{Standardized factor loading})^2 + (\sum \text{Measurement errors of each measured variable})]$

【Note 2】 $AVE = \sum (\text{Standardized factor loading})^2 / [(\sum \text{Standardized factor loading})^2 + (\sum \text{Measurement errors of each measured variable})]$

Table 4. The Square Values Of Correlation Coefficient Between Constructs And The Variance Extracted

Constructs	PE	EE	SI	FC	PS	BI
PE	0.59					
EE	0.26	0.60				
SI	0.16	0.14	0.61			
FC	0.11	0.14	0.20	0.63		
PS	-0.15	-0.18	-	-0.13	0.61	
BI	0.45	0.37	0.11	0.21	-0.12	0.72

Note: The diagonal lines are the AVE values of the constructs; the non-diagonal lines are the square values of each construct's correlation coefficients.

Structural Model

The structural model analysis includes the goodness of fit analysis and the explanatory power of the entire research model. This research referred to the opinions of Bagozzi and Yi (1988), Joreskog and Sorbom(1996), and Bentler (1990, 1992) and selected seven indicators to conduct goodness of fit evaluation for the entire mdoel, including the chi-square and the ratio value of the degree of freedom ($\chi^2/d.f.$), the adjusted goodness-of-fit index (AGFI), the normed fit index (NFI), the non-normed fit index (NNFI), the comparative fit index (CFI), the relative fit index (RFI), and the root mean square error of approximation (RMSEA). The results are organized and shown in Table 5.

Table 5. The Goodness of Fit of Each of the Model's Indicator

Goodness of fit indicator	Suggestive values	References	Evaluation model	Structural model
$\chi^2/d.f.$	≤ 3.00	Bagozzi and Yi (1988) ; Hair et al. (2005)	2.79	2.92
AGFI	≥ 0.80	Hair et al. (2005)	0.80	0.81
NFI	≥ 0.90	Hair et al. (2005)	0.90	0.91
NNFI	≥ 0.90	Bentler and Bonnett (1980) ; Bentler (1990) ; Hair et al. (2005)	0.91	0.91
CFI	≥ 0.90	Bentler and Bonnett (1980) ; Bentler (1990) ; Hair et al. (2005)	0.91	0.92
RFI	≥ 0.90	Bentler and Bonnett (1980) ; Bentler (1990) ; Hair et al. (2005)	0.91	0.92
RMSEA	≤ 0.08	Hair et al. (2005)	0.062	0.073

As indicated in Table 5, Bagozzi and Yi (1988) considered that the chi-square and the ratio value of the degree of freedom ($\chi^2/d.f.$) were not greater than three as the standard was. Hair et al. (2005) indicated that when the sample number was above 200, the chi-square and the ratio value of the degree of freedom ($\chi^2/d.f.$) would be too sensitive and possibly greater than three. Therefore, other goodness of fit indicators must be used as references. This study's chi-square and the ratio value of the degree of freedom ($\chi^2/d.f.$) are slightly smaller than 3. If taking this study's 264 samples into

consideration, then it is still a reasonably acceptable model. As for other indicators, most of it agree to the research suggestive values: $AGFI \geq 0.80$; $NFI \geq 0.90$; $NNFI \geq 0.90$, $CFI \geq 0.90$; $RFI \geq 0.90$; $RMSEA \leq 0.08$. Overall, our model and observation data have excellent goodness of fit.

Table 6 indicates the construct path relations estimated by the structural equation modeling (SEM). The path value is the standardized coefficient. The five assumptions of the confirmatory research model all reach the significance level of $\alpha = 0.05$. The path analysis coefficients of the structural model are performance expectancy \rightarrow behavioral intention (0.453); effort expectancy \rightarrow behavioral intention (0.237); social influence \rightarrow behavioral intention (0.184); facilitating

Table 6. The Verification of Research Hypotheses

	Hypotheses	Path Value	t value
	Performance		
H ₁	Performance expectancy \rightarrow Behavioral intention	0.453	6.292
H ₂	Effort expectancy \rightarrow Behavioral intention	0.237	7.596
H ₃	Social influence \rightarrow Behavioral intention	0.184	8.113
H ₄	Facilitating conditions \rightarrow Behavioral intention	0.197	7.746
H ₅	Perceived sacrifice \rightarrow Behavioral intention	-0.106	6.714

conditions \rightarrow behavioral intention (0.197); perceived sacrifice \rightarrow behavioral intention (-0.106).

Then, based on gender, this research divided the returned samples into the male group ($n_1=138$) and the female group ($n_2=126$) to examine whether gender has any significant difference towards the path relation of the model. First, this research conducted two rounds of SEM structural model analysis to obtain the path coefficient

(regression coefficient) of the each group's sample. Then, the differences between two standardized regression coefficients (β) were substituted into the the following t-test formula. The t-test was used to examine the path relation between gender and individual regression coefficient (Cohen and Cohen, 1983, p.55-56), wherein the degree of freedom was $df=n_1+n_2-4$.

$$t = \frac{\beta_1 - \beta_2}{\sqrt{\frac{\sum(Y_1 - \hat{Y}_1)^2 + \sum(Y_2 - \hat{Y}_2)^2}{n_1 + n_2 - 4} \times \frac{\sum X_1^2 + \sum X_2^2}{\sum X_1^2 \times \sum X_2^2}}}$$

Table 7 indicates that gender differences would significantly influence the path relations of the following

- (1) Performance expectancy → Behavioral intention
- (2) Effort expectancy → Behavioral intention
- (3) Social influence → Behavioral intention
- (4) Perceived sacrifice → Behavioral intention

Results and Suggestions

Research Results

From the perspective of the segmentation variable, male and female users could possibly have different acceptance decision models. Therefore, the focus of this study was to investigate whether the acceptance behaviors of users with different gender had different behavioral intentions towards the new technology, such as e-learning.

Table 7. Gender's Influence on Each Regression Co-efficient

	Male (n ₁ =138)	Female (n ₂ =126)	β ₁ -β ₂ (t value)
Performance expectancy → Behavioral intention	β = .419	β = .501	.082* (3.31)

Effort expectancy→Behavioral intention	$\beta = .265$	$\beta = .208$.057* (3.19)
Social influence→Behavioral intention	$\beta = .221$	$\beta = .168$.053* (3.22)
Facilitating conditions→Behavioral intention	$\beta = .204$	$\beta = .182$.022 (1.59)
Perceived sacrifice→Behavioral intention	$\beta = -.147$	$\beta = -.095$.052* (2.99)

* P<.05

Overall, this study verified Venkatesh et al. (2003)'s UTAUT model, which was applicable to the e-learning field of Taiwanese colleges. That is, teachers' PE and EE toward e-learning all had positive influence on the intention of using e-learning. Teachers were also affected by some SI, which in turn, positively influenced the teachers' using intention. E-learning related FC also positively influenced teachers' e-learning using intention. In addition, the perceived sacrifice of e-learning would negatively influence teachers' e-learning using intention.

The study used the UTAUT model with more than 70% explanatory power to conduct testing. Furthermore, based on market segmentation theory, gender was used for grouping. The empirical results of this study indicated that the path relations of the e-learning UTAUT model (β value) of male teachers were significantly higher than the path values of female teachers. In other words, e-learning teachers' gender would significantly influence the path relations (β value) of PE→BI, EE→BI, SI→BI, and PS→BI.

Practical Implications

As for the field, Venkatesh et al. (2003)'s UTAUT model has explained that PE, EE, SI, and FC of the users would positively influence their e-learning using intention. However, to e-learning related personnel, due to the limitation of resources,

they would like to understand how to segment teachers to have effective application of resources; that is, which of the variables can be used as segmentation variables.

By reviewing marketing related theories, this study discovered that in the past marketing field, gender that was often used as a variable to segment consumers' consumption behavior should indicate certain feasible directions. Therefore, this study first conducted gender groupings for teachers and verified the influence on the path relation of the e-learning UTAUT model. The empirical results indicated that male teachers had greater influence on each path relation (β value) of the UTAUT model than female teachers did. The difference reached statistical significance. This verified that gender was a good segmentation variable for teachers' e-learning using behaviors.

Additionally, through the observations of β values, male teachers' β values were significantly greater than female teachers' were. This finding would be beneficial for the understanding of e-learning service providers. Perhaps, investing the same resources in male teachers would theoretically generate better teacher acceptance effects than investing the resources in female teachers.

Research Contributions

This research has the following contributions for the e-learning research: 1. regarding the UTAUT model has indicated positive factors. However, the negative factor, perceived sacrifice, was not integrated into the model. After the verification of this study, certainly some negative effects existed in perceived sacrifice for the using intention. 2. We used a refined way to investigate the influence of the segmentation variable, gender, on the path value of the UTAUT model. In addition, we employed an in-depth method to inspect whether the influence of moderating variables on each set of the regression coefficients (β value) had any significant differences. The finding would be valuable for the industry and for academic circles.

Limitations and Suggestions For Future Research Directions

During the research process, this study tried to overcome many obstacles to increase the research reliability and effectiveness. However, with limited labor and resources, certain research limitations still existed. We make the following suggestions:

1. The subjects of this study were teachers with experiences in using e-learning, because the total number of the actual population and the overall boundary could not be defined, the research budget and time were limited, and random sampling could not be adopted. Therefore, purposive sampling was used instead. However, the study still tried to increase the representativeness of the samples by, for example, increasing the sample sources and expanding the number of samples.
2. Applying the UTAUT model to the e-learning field was relatively new. The results and implications of this study were obtained from a single empirical research study. Therefore, one should be careful when making deductions to other commercial types or user organizations.
3. This study used a snapshot (cross-section) method to understand the inter-relationships of each construct in the model, which could be oversimplified. Rationally, there should be reinforcements through vertical-section proofs.
4. This study did not conduct research toward a specific topic of e-learning. Therefore, the research results may not be applicable to professional e-learning in a specific field; for example, e-learning in the commerce-field and in the engineering field may differ from each other.

References

Agaoglu, E., Imer, G., & Kurubacak, G. (2002). A case study of organizing distance education:

- Anadolu University. *Turkish Online Journal of Distance Education*, 3(1), 45-51.
- Bagozzi, R. P. and Yi, Y. (1988), "On the Evaluation of Structural Equation Models," *Journal of the Academy of Marketing Science*, 16, 74-94.
- Baker, J., Parasuraman, A., Grewal, D. and Voss, G.B. (2002), "The influence of Multiple Store Environment Cues on Perceived Merchandise Value and Patronage Intentions," *Journal of Marketing*, 66(April), 120-141.
- Cohen, J. and Cohen, P. (1983), *Applied Multiple Regression/Correlation Analysis of the Behavior Science* (2nd ed.), Lawrence Erlbaum Associates, NJ: Hillsdale.
- Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. (1989), "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science*, 35(8), 982-1003.
- Ding, L., Velicer, W. and Harlow, L. (1995), "Effect of Estimation Methods, Number of Indicators per Factor and Improper Solutions on Structural Equation Modeling Fit Indices," *Structural Equation Modeling*, 2(2), 119-143.
- Fornell, C. and Larcker, D. F. (1981), "Evaluating Structural Equation Models with Unobservable and Measurement Error: A Comment," *Journal of Marketing Research*, 18(3), 39-50.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2005), *Multivariate data Analysis* (6th ed.), Upper Saddle River, NJ: Prentice Hall.
- Homburg, C. and Giering, A. (2001). Personal characteristics as moderators of the relationship between customer satisfaction and loyalty - An empirical analysis, *Psychology & Marketing*, 18(1), 43-66.
- Jasper, C. R., and Lan, P. N. R. (1992). Apparel catalog patronage: demographic, lifestyle and motivational factors. *Psychology & Marketing* 9(4), 275-296.
- Lacobucci, D. and Ostrom, A. (1993). Gender differences in the impact of core and relational aspects of services on the evaluation of service encounters. *Journal of Consumer Psychology* 2(3), 257-286.

- Lin, C. P., and Ding, C. G. (2005). Opening the black box: assessing the mediating mechanism of relationship quality and the moderating effects of prior experience in ISP service. *International Journal of Service Industry Management*, 16(1), 55-80.
- Liu, Y. (2002). Distance and traditional education teaching the same course via instructional television and traditional educational formats: A case study. *Turkish Online Journal of Distance Education*, 3(1), 5-13.
- Monroe, K.B. and Krishnan R. (1985), "The Effect of Price on Subjective Product Evaluation," In *Perceived Quality: How Consumers View Stores and Merchandies*. Eds. Jacob and Jerry C. Olson Lexington, MA: Lexington Books, 209-232.
- Moore, M. G. and Kearsley, G. (1996), *Distance Education: A Systems View*, Belmont: Wadsworth.
- Nunnally, J. C. (1978), *Psychometric theory* (2nd ed.), New York: McGraw-Hill.
- Ozkul, A. E. (2001). Anadolu University distance education system from emergence to 21st century. *Turkish Online Journal of Distance Education*, 2(1), 17-31.
- Slama, M. E., and Tashlian, A. (1985). Selected socioeconomic and demographic characteristics associated with purchasing involvement. *Journal of Marketing*, 49(1), 72-82.
- Teas, R. K. and Agarwal S. (2000), "Perceived Value: Mediating Role of Perceived Risk," *Journal of Marketing Theory and Practice*, 9(4), 1-14.
- Thompson, R. L., Higgins, C. A. and Howell, J. M. (1991), "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly*, 15(1), 124-143.
- Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. (2003), "User Acceptance of Information Technology: Toward A Unified View," *MIS Quarterly*, 27, 425-478.
- Zeithaml, V. A. (1988), "Consumer Perceptions of Price, Quality and Value: A Means-End Model and Synthesis of Evidence," *Journal of Marketing*, 52(July), 2-22.



THE INFLUENCE OF KNOWLEDGE WORKERS ON OCCUPATIONAL COMMITMENT

Chih-Chung Chen_

Department of Knowledge Management, Aletheia University (Matou campus)
Tainan City 704 , Taiwan , R.O.C.
ccchen.jason@msa.hinet.net

Yao-Sheng Hsu

Department of Business Administration, Diwan College of Management,
Tainan City Taiwan , ROC.
pigous@ms27.hinet.net

Feng-Cheng Tung

Department of Real Estate Management, Kun Shan University.
Tainan City 70059, Taiwan, R.O.C
tungfc66@yahoo.com.tw

Ming Shing Lee

Department of Innovation and Entrepreneurship, Far East University
Tainan County 744, Taiwan , R.O.C
mslee215@ms31.hinet.net

Abstract

This research explored work attitudes from the perspective of knowledge workers. Convenient sampling was adopted; 350 questionnaires were delivered, and 303 replies received—237 of which were valid, resulting in a 68% receipt rate. The analysis finds that a clear organizational culture is helpful for employees in regard to receiving job satisfaction from their work environment. In addition, employees' organizational commitment was increased. In regard to two dimensions—namely,

organizational commitment and occupational commitment—stronger organizational commitment resulted in stronger occupational commitment.

Keywords: Occupational commitment, Organizational culture, Organizational commitment, Job satisfaction.

Introduction

With the coming of the knowledge era, knowledge has become the most important basis for competition. In his book entitled *Post Capitalist Society*, Drucker (1993) mentioned that—in a new society—the production factors that are actually dominant and absolutely determinant rely on knowledge rather than capital, land, or labor. Thus, when people enter a knowledge-dense society, jobs requiring operational effort are dramatically reduced while professional job vacancies are more common. The primary workers in these knowledge-dense industries are knowledge workers (Drucker, 1997). Drucker (2000) further clearly predicated that, by 2005, knowledge workers would become the largest population among the labors. Thus, determining how to attract, inspire, and keep knowledge workers to stay—together with ways to enhance their job productivity—has become critical for business organizations seeking to create and maintain their own competition advantages (Drucker, 1999). The best way to remain knowledge workers is to strengthen their job satisfaction and organizational commitment to the organization.

Despite this development, in Taiwan's high-tech industries, the key consideration for determining whether talented workers stay or leave their jobs remains rooted in salaries, stocks, and bonuses. This situation also creates troubles for business owners. According to Drucker (2002) in his book entitled *Managing in the Next Society*, to date, no business organizations, institutions, or governmental agencies have been able to find an available way to manage these knowledge workers. Instead, they simply cater to knowledge workers by spending money. However, relying on approaches focused on greed and monetary gain will not satisfy these knowledge workers. Only by satisfying their values—namely, allowing knowledge workers to gain recognition and power in society—can effective management be achieved.

A review of existing literature indicates that most research on knowledge workers focuses on job characteristics and features, using an exploratory approach rather than an experimental approach. In light of the research dimensions related to employees' job satisfaction, most researchers have adopted the organizational commitment dimension. Previous research has also emphasized various organizational cultures. However, few studies have focused on occupational commitment. Moreover, research into the influence of organizational commitment and occupational commitment from the perspective of knowledge workers is quite

rare. Thus, further exploration and analysis is required to determine whether knowledge workers' job satisfaction significantly correlates to organizational commitment and whether additional considerations of occupational commitment could influence their job satisfaction, consequently reducing turnover rates related to job satisfaction. Tam, Marek, and Frenkel (2002) concluded that knowledge workers' occupational commitment could influence their work attitude. Indeed, knowledge workers' occupational commitment was not necessarily equivalent to organizational commitment, which could naturally cause different degrees of influence on their work attitude. Thus, determining ways in which to alleviate knowledge workers' unsatisfied feeling in regard to their firms and thereby reduce turnover rates is a very critical issue.

Literature Review

Knowledge Workers

Drucker (1993) postulated that, in a knowledge-based society, knowledge workers would become the important property among organizations because knowledge workers know how to allocate knowledge to achieve the most effective application. This situation is similar to idea that capitalists know how to allocate capital effectively. Based on Horibe's (1999) proposal, the term *knowledge worker* referred anyone who creates production values using their brains more than their

hands. In other words, they are people who create value by means of their ideas, analysis, judgment, and design. Robert (1990) concluded that the jobs involving knowledge workers are considerably wide, although he determined that three primary types of firms employed these workers—namely 1) production, processing and broadcasting industries such as mass broadcast, education, and PC software industries; 2) production industries such as product designers, researchers, and analyzers; and 3) independent professionals such as engineers, lawyers and consultants. Thus, based on the literature, knowledge workers are those individuals who use mental efforts more than physical efforts to carry out their jobs, which include information processing and analyzing as well as the proposal of sophisticated ideas to create new values.

In addition, knowledge workers rely on continuous innovation and a strong sense of responsibility. As such, managing knowledge workers requires a different approach than traditional hierarchical management. Indeed, the goal in managing these workers is to engage them in exerting their values most while eliminating ignorance. Thus, the current research aims to explore knowledge workers—in particular, those in Robert's (1990) independent professional category (e.g., engineers, lawyers, and consultants)—focusing on all-time insurance operators (financial consultants).

Organizational Culture

According to Robbins (1990), the term *organizational culture* refers not only to varying degrees of organization within firms, but also to the firms' unique traditions, values, customs, and socializing processes. Such a culture could be long-term and influence members' attitudes and behaviors. Wallach (1983) identified three types of organizational culture: 1) bureaucratic culture, in which the duty and responsibility are clearly delineated and the nature of jobs mostly standardized and fixed—such a culture is often created on the basis of control and power and generally includes more mature, stable, and prudent business organizations; 2) innovative culture, in which organizations face competition using complicated variations as well as violent and dynamic factors, while jobs involve higher creativity and risk—in such a culture, people with an entrepreneurial spirit and strong passion would be more successful as members' challenges and innovation are highly emphasized and adventure promoted; and 3) supportive culture, in which the environment is usually quite open and harmonious, with an atmosphere like a warm home that provides high degrees of support, fairness, encouragement, and trust existed—in such environments, interpersonal relations are essential.

As such, organizational culture refers to an organization's long-term internal system operations combined with the interaction of the external environment. Such a culture integrates relevant values, beliefs, consciousness, thinking, and actions. Its

intangible existence could tangibly regulate its members—together with the organizational behaviors and actions—to form the phenomenon of organizational development in daily life.

Occupational Commitment

Occupational commitment and organizational commitment are two different types of commitment. The use of the term *occupational commitment* has been confusing due to various research studies focusing on career commitment (Morrow & McElroy, 1987), occupational commitment (Aranya & Ferris, 1984; Meyer, Allen, & Smith, 1993), and professional commitment. The development of occupational commitment stemmed primarily from the exploration of organizational commitment. Consequently, most definitions originated from the modification of organizational commitment. Meyer et al. (1993) also expanded three dimensions of organizational commitment to occupational commitment. They suggested that occupational commitment referred to employees' commitment to their own particular line of work, including personal identity and involvement in the values of occupations to which they belonged. As a result, anyone who changed occupations or occupational engagement under normative pressure could face a loss of occupational consciousness. Thus, occupational commitment refers to one's commitment to personal career or occupation (Wallace, 1993). In the current research, all terminologies relevant to

professional commitment or occupational commitment are collectively referred to as occupational commitment.

To measure dimensions of occupational commitment, Meyer et al. (1993) used three categories. First, affective commitment refers to the already proven satisfaction for organizational members' occupational involvement (such as opportunities provided to complete satisfied jobs or develop valuable work skills). Second, continuous commitment means all possible loss or values of an individual's investment if he or she attempted to change occupations. In other words, employees would recognize the required considerable cost associated with quitting their jobs, which adversely triggers occupational commitment. Finally, normative commitment emphasizes the maintenance of loyalty to organizations as the exact result of a socializing experience or interest obtained from organizations. According to organization members, organizations' obligation to reciprocate consequently arises. Moreover, employees adhere to their posts based on their occupational loyalty due to internal normative pressure or interest obtained from occupations based on mutual advantage.

However, previous studies' emphasis on employees examined the correlation between organizational commitment and work attitude, providing no further discussion on occupational commitment. Based on the previous discussion herein,

knowledge workers have particular characteristics (e.g., making themselves independent outside the organizations through their own professional knowledge and capabilities, resulting in job relocation). Thus, it is possible that they demonstrate a stronger sense of recognition in regard to occupational commitment but a weaker sense of organizational commitment as current organizations serve as a path to career relocation. For example, According to Xu (2001), the organizational culture of a school is positively correlated to teachers' occupational commitment. Thus, organizational culture appears to be positively correlated to occupational commitment.

Hypothesis 1: Organizational culture has a positive relationship to occupational commitment.

Organizational Commitment

In the field of organization theories, researchers have determined that organizational commitment can explain the behavior performance between individuals and groups (Becker, 1960). Organizational commitment has been used more often to determine turnover rates than job satisfaction, yet it has also been an important indicator of organizational performance. Meyer et al. (1993) suggested that organizational commitment refers to employees' commitment to their employers. To measure organizational commitment, Meyer et al. (1993) again relied on three categories. First, affective commitment refers to organizational members' willingness to stay and continuously serve their organizations. Second, continuous commitment

refers to organizational members' recognition of organizational costs, which leads them to stay in their organizations. Members generally decide their continuous commitment to organizations based on two aspects—namely, measuring the probabilities of job vacancies in outside organizations and sensing the required (sacrificed) cost for resignation. Finally, normative commitment emphasizes members' loyalty to organizations based on socializing experiences or interest generated from organizations. Organization members thus perceive a need for organizations to reciprocate obligation. Meyer et al.'s (1993) categories are used in the current research. In addition, *organizational commitment* herein refers to employees' commitment to their employers.

Robbins (1998) contended that hard culture causes a profound influence on organizational commitment. A harder culture can accept more members in the organizations with core values, generating a higher commitment to these core values. In addition, members in the organizations with a hard culture demonstrate a stronger identity to organizations. Taylor, Levy, Boyacigiller, and Beechler (2008) concluded that organizational culture characterized by high adaptability has a significant and direct effect on organizational commitment. Indeed, a majority of scholars have found that organizational culture significantly correlates to organizational commitment, indicating that organizational culture could influence the extent of members'

organizational commitment. In other words, organizational culture brings about significant consistency. A stronger organizational culture can sense a better organizational climate, generating stronger organizational commitment of employees. Thus, organizational culture appears to positively correlate to organizational commitment.

Hypothesis 2: Organizational culture is positively related to organizational commitment.

Job Satisfaction

Hellriegel, Slocum, and Woodman (1995) defined job satisfaction as a type of delightful or positive emotion stemming from an individual's job or work experience. Connolly and Viswesvaran (2000) concurred, defining job satisfaction as the delight evaluated from an individual's job triggered by active emotion. Job satisfaction also provides an important indicator for exploring organizational psychology in industries. Connolly and Viswesvaran (2000) explored job satisfaction using three dimensions: active emotion, passive emotion, and emotional inclination.

According to Robbins (1998), when an individual's demand is consistent with culture, it naturally results in the highest satisfaction. For example, people with highly autonomous and achievement-motivated characteristics have a higher satisfaction from an organizational culture with less severe supervision and higher emphasis on remuneration. Park and Kim (2009) found that consensual culture and rational culture

have significant, positive associations with job satisfaction. In fact, the majority of scholars argued that organizational culture is significantly correlated to job satisfaction, meaning that organizational culture influences the degree of job satisfaction in employees' minds. Thus, the current research proposes that organizational culture positively correlates to job satisfaction.

Hypothesis 3: Organizational culture is positively related to job satisfaction.

Cross and Billingsley (1994) examined educators' willingness to keep their current jobs, concluding that job satisfaction is positively correlated to occupational commitment. Job satisfaction is also an important variable influencing occupational commitment of educators engaged in special education jobs. Furthermore, Kaldenberg, Becker, and Zvonkovic (1995) found that both male and female dentists who are younger than 45 years old identify a positive correlation between job satisfaction and emotional occupational commitment. Biau (2003) found that job satisfaction has stronger positive relationships to affective and normative occupational commitment. Thus, job satisfaction seems to influence occupational commitment, positively correlating to occupational commitment.

Hypothesis 4: Job satisfaction is positively related to occupational commitment.

In addition, Clive and Richard (1996) examined the correlation among performance management, job satisfaction, and organizational commitment in both

public and private sectors in the United Kingdom. The authors found that job satisfaction demonstrated a significant correlation to organizational commitment. Deshpande and Satish (1996) further proved that improving employees' job satisfaction enhances their commitment to organizations and results in a higher willingness to devote themselves to organizations with excellent performance. Meanwhile, McNeese-Smith(2001) concluded that job satisfaction affects organizational commitment. Indeed, Huang and Hsiao (2007) found that job satisfaction has a significant and positive effect (Beta = .208, f-value = 3.200) on organizational commitment. Such findings indicate the direct or indirect influence of job satisfaction on organizational commitment. In addition, organizational commitment significantly correlates to job satisfaction and is more influential than job satisfaction. Thus, job satisfaction likely positively correlates to organizational commitment.

Hypothesis 5: Job satisfaction is positively related to organizational commitment.

Finally, Tam et al. (2002) determined that knowledge workers' occupational commitment and organizational commitment are not mutually equivalent. Given that most scholars supported the assertion that occupational commitment and organizational commitment are positively correlated, this discussion suggests that organizational commitment positively correlates to occupational commitment.

Hypothesis 6: Organizational commitment is positively related to occupational commitment.

Methods

Sampling Data Distribution

Questionnaires were mailed to insurance company employees (financial consultants). To increase the rate of return, questionnaires were sent exclusively to students working in the insurance company’s southern district. After completing the questionnaire, respondents were asked to return it for data analysis. In total, 350 questionnaires were delivered, with 303 replies received. After deleting 66 invalid replies, 237 valid replies remained (68% response rate). The sampling data are shown in Table 1.

Table 1. Sampling Data Distribution

Variable		n	Percentage (%)	Variable	n	Percentage (%)	
Gender	Male	91	38.4	Seniority	1 yr below	53	22.4
	Female	146	61.6		1.1-3 yr	58	24.5
Marital Status	Married	89	37.7		3.1-6 yr	66	27.8
	Unmarried	148	62.4		6.1-9 yr	54	22.8
Age	30 below	125	52.7		9.1-12 yr	6	2.5
	31-35	45	19.0	1pc	36	15.2	
	36 above	67	28.3	2pc	39	16.5	
Academic Degree	College graduate	132	55.7	3pc	69	29.1	
	University Graduate	105	44.3	4pc	51	21.5	
				5pc(inclusive) above	42	17.7	

Organizational Culture

The organizational culture measurement scale was based on Wallach’s (1983) opinions. Organizational culture can be categorized as a hierarchical culture, an

innovative culture, or a supportive culture. Each organization includes these categories to varying degrees based on the correlation among personnel characteristics, management approaches, and organizational culture. The measurement scale used herein included 30 questions in total, 10 covering each category. Questions 1-10 measured innovative culture, questions 11-20 measured hierarchical culture, and questions 21-30 measured supportive culture. A 7-point Likert scale was used to answer these questions.

Organizational Commitment

The structure for this measurement scale was based on the work of Meyer et al. (1993), who categorized organizational commitment into three types— affective commitment, continuous commitment, and normative commitment—to reflect employees' commitment to their employers. Eighteen questions—six for each type—were included in the measurement scale. Questions 1-6 measured affective commitment, questions 7-12 measured continuous commitment, and questions 13-18 measured normative commitment. Questions 3, 4, 5, and 13 involved inverse propositions, while the remaining questions were positive propositions. As with the previous scale, a 7-point Likert scale was used for these questions.

Occupational Commitment

The scale structure for occupational commitment was also based on Meyer et al.'s (1993) work, which divided occupational commitment into three types— affective commitment, continuous commitment, and normative commitment—to reflect employees' commitment to their particular line of work. Eighteen questions— six for each type—were included in the measurement scale. Questions 1-6 measured affective commitment, questions 7-12 measured continuous commitment, and questions 13-18 measured normative commitment. Questions 2, 4, 5, 11, and 14 involved inverse propositions, while the remaining questions were positive propositions. As with the previous scales, a 7-point Likert scale was used for these questions.

Job Satisfaction

The job satisfaction scale was based on the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Davis, England, & Lofquist, 1967), translated by Liao (1978). The questions were divided into long and short versions. The long version, which included 100 questions, comprised 20 component scales, with each covering 5 questions. The short version, which included 20 questions, comprised the highest correlative question from every component scale as the representative question for every component scale. This scale was divided into three major parts: internal satisfaction, external

satisfaction, and general satisfaction. A 7-point Likert scale was again adopted for these questions.

Demographic Data

Demographic data including gender, marital status, age, academic background, seniorities, and licenses were also gathered.

Results

Using the statistical tools SPSS11.0 and AMOS4.0, the hypotheses presented herein were tested using the gathered data. The reliability for every dimension rated above 0.7 indicates sufficient reliability. Additional relevant information is provided in Table 2.

Table 2. Mean, Standard Deviation and Reliability

	Mean	Standard Deviation	Organizational Culture	Occupational commitment	Organizational Commitment	Job Satisfaction
Organizational Culture	5.6716	.76187	(.8827)			
Occupational commitment	5.8697	.69265	.068	(.9771)		
Organizational Commitment	5.2813	.64859	.523**	.593**	(.8952)	
Job Satisfaction	6.1673	.64939	.608**	.014	.734**	(.8587)

In regard to Hypothesis 1, no significant influence was found in the data, with a statistical value rated at 0.04 and a *p* value at 0.198, without reaching the significant standard. Thus, Hypothesis 1 was not supported. Similarly, Hypothesis 2 was not supported, as no significant influence was found, with statistical value rated at 0.03 and a *p* value at 0.787, without reaching the significant standard. In Hypothesis 3,

significant influence was found in the research, with a statistical value rated at 0.56 and a p value at 0.000, achieving the significant standard. Thus, Hypothesis 3 was supported. These results are similar to those in Robbins (1984) and Park and Kim (2009).

In regard to Hypothesis 4, no significant influence was found in the research, with the statistical value rated at 0.19 and p value at 0.078, without reaching the significant standard. Thus, Hypothesis 4 was not supported. Again, these results are similar to those in Cross and Billingsley (1994), Kaldenberg et al. (1995), and Biau (2003), although no significant correlation was reached. Meanwhile, Hypothesis 5 was supported. Significant influence was found, with the statistical value rated at 0.23 and p value at 0.038, reaching the significant standard. These results are similar to those in Clive and Richard (1996), Deshpande and Satish (1996), McNeese-Smith (2001), and Huang and Hsiao (2007). Finally, Hypothesis 6 was also supported. Significant influence was evident, with the statistical value rated at 1.14 and p value at 0.000, reaching the significant standard. These results are similar to those in Tam et al. (2002). Figure 1 presents these findings graphically.

Conclusion and Suggestions for Future Research

This research sought to identify correlations between organizational culture, employees' satisfaction, organizational commitment and occupational commitment

among insurance operators (finance management consultants). The findings demonstrated that a clear and stable organizational culture is helpful for enabling employees to achieve satisfaction in their work environment. Thus, firms should focus on how to pass organizational culture on to employees to enable employees to achieve

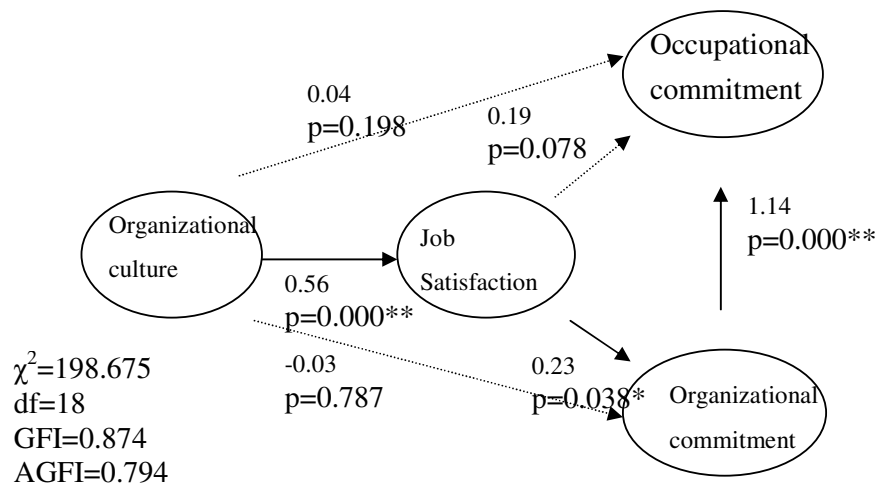


Figure 1. Research Model

sufficient satisfaction. One way to do so would be to create clear regulations and systems, work processes, and team priorities to engage employees much more in organizations.

In addition, in regard to job satisfaction, employees' organizational commitment was enhanced. Many previous researches have demonstrated the influence of enhanced organizational commitment. Thus, firms should focus on making employees

feel satisfied with the intangible or tangible rewards given by firms. For example, they could improve work environments, enhance necessary office software and hardware, implement appropriate reward systems, fulfill employees' demands for mental satisfaction and reasonable performance measurement methods, thereby making employees feel more satisfied when joining organizations.

The findings herein also supported the conclusion of Tam et al. (2002), who demonstrated a mutual correlation between organizational commitment and occupational commitment. Previous research indicated that stronger organizational commitment naturally generates stronger occupational commitment. According to the current results, higher average scores on occupational commitment led to higher scores on organizational commitment (5.8697, 5.2813). The data indirectly indicated that sampling respondents showed a positive identity to occupational commitment—namely, they invested in themselves more than in organizations. Thus, firm managers should understand employees' work attitudes and emphasize the possible influence on firms caused by occupational commitment. They should further understand the difference between firms and organizational commitment to prevent employees' self-enhancement in preparation of relocating and negotiating, instead making good use of employees' capabilities to achieve assigned tasks or goals in organizations. Thus, firms should focus on reasonable career development plans for employees to enhance

employees' cohesion to organizations, thereby making employees more satisfied in their decision to stay in the organizations. In addition, they could exert their own capabilities and profession skills in organizations without the attitude of having a short-term career stay in the firm. Employees should be encouraged to devote their professional skills and enhanced loyalty. In this way, stronger organizational commitment and occupational commitment will be achieved simultaneously.

The current study also has an inherent limitation that should be addressed in future studies. The research sample was limited to financial consultants. To generalize the findings outlined herein, the research should be extended to other kinds of firms in the future.

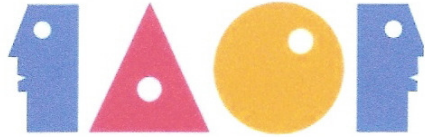
References

- Aranya, N., & Ferris, K. R. (1984). Are examinations of accountants' organizational professional conflict? *The Accounting Review*, 54(1), 1-15.
- Becker, H. S. (1960). Notes on the concept of commitment. *The American Journal of Sociology*, 66(1), 32-40.
- Biau, G.(2003). Testing for a four-dimensional structure of occupational commitment, *Journal of Occupational and Organizational Psychology*, 76, 469-488
- Clive, F., & Richard, W. (1996). Performance management, job satisfaction and organizational commitment. *British Journal of Management*, 7(2), 169-179.
- Connolly, J. J., & Viswesvaran, C. (2000). The role of affectivity in job satisfaction: A meta-analysis. *Personality and Individual Differences*, 29(2), 265-281.

- Cross, L. H., & Billingsley, B. S. (1994). Test a model of special educator's intent to stay in teaching. *Exceptional Children*, 60(5), 411-421.
- Deal, T. E., & Kennedy, A. A. (1982). *Corporate Culture: The Rite and Rituals of Corporate Life*. Reading, MA: Addison-Wesley.
- Deshpande, L., & Satish, P. (1996). The impact of ethical climate types on facets of job satisfaction: An empirical investigation. *Journal of Business Ethics*, 15(6), 655-660.
- Drucker, P. F. (1993). *Post-Capitalist Society*. New York: Harper Business.
- Drucker, P. F. (1997). My life as a knowledge worker. *Inc*, 19(2), 76-80.
- Drucker, P. F. (1999). Knowledge-worker productivity: The biggest challenge. *California Management Review*, 41(2), 79-94.
- Drucker, P. F. (2000). Knowledge work. *Executive Excellence*, 17(4), 11-12.
- Drucker, P. F. (2002). *Managing in the Next Society*. New York: St. Martins Pr.
- Hellriegel, D., Slocum, J. W., & Woodman, R. W. (1995). *Organizational Behavior* (7 ed.). New York: West.
- Horibe, F. (1999). *Managing Knowledge Workers*. Canada: John Wiley & Sons.
- Huang, T. C. & Hsiao, W. J. (2007). The casual relationship between job satisfaction and organization commitment. *Social Behavior and Personality*, 35(9), 1265-1275.
- Kaldenberg, D. O., Becker, B. W., & Zvonkovic, A. (1995). Work and commitment among young professionals: A study of male and female dentists. *Human Relations*, 48(11), 1355-1377.
- Liao, S.-H. (1978). *The Correlation on Elementary School Principals' Leadership, Teacher Personalities and Teachers' Job Satisfaction*, Unpublished master's

- degree dissertation, Education Graduate Institute at the National Chengchi University, Chengchi, Taiwan.
- McCloskey, J. C., & McCain, B. E. (1987). Satisfaction, commitment and professionalism of newly employed nurses. *Journal of Nursing Scholarship*, 19, 20-24.
- McNeese-Smith, D. K. (2001). A nursing shortage: Building organizational commitment among nurses. *Journal of Healthcare Management*, 46, 173-186.
- Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to organization and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, 78(4), 538-551.
- Morrow, P. C., & McElroy, J. C. (1987). Work commitment and job satisfaction over three career stages. *Journal of Vocational Behavior*, 30, 339-346.
- Park, J. S. & Kim, T. H. (2009), Do types of organizational culture matter in nurse job satisfaction and turnover intention? *Leadership in Health Services*, 22(1), 20-38.
- Robbins, S. P. (1990). *Organization Theory: Structure, Design, and Application*. San Diego: Prentice-Hall.
- Robbins, S. P. (1998). *Organizational Behavior* (8th ed.). New Jersey: Prentice-Hall, Inc.
- Robert, E. (1990). Managing the new workforce. *Machine Design*, 62(9), 109-114.
- Tam, Y.-M. M., Korczyński, M., & Frenkel, S. J. (2002). Organizational and occupational commitment: Knowledge workers in large corporations. *Journal of Management Studies*, 39(6), 775-801.
- Taylor, S., Levy, O., Boyacigiller, N. A., & Beechler, S. (2008). Employee commitment in MNCs: Impacts of organizational culture, HRM and top management orientations. *The International Journal of Human Resource Management*, 19(4), 501-527.

- Wallace, J. E. (1993). Performance and organizational commitment: compatible or incompatible? *Journal of Vocational Behavior*, 42,333-379.
- Wallach, E. J. (1983). Individuals and Organizations: The Cultural March. *Training and Development Journal*, 29-36.
- Weiss, D. J., Davis, R. V., England, G. W., & Lofquist, L. H. (1967). *Manual for the Minnesota Satisfaction Questionnaire*. Minneapolis: Industrial Relations Center, University of Minnesota.
- Xu, C.-Y. (2001). The correlation research on teachers' organizational culture and professional commitment in elementary schools—Taking Taoyuan, Hsinchu and Miaoli regions for example. Unpublished master's degree dissertation, Graduate Institute of Elementary and Secondary Education at the National Hsinchu University of Education, Taipei, Taiwan.



BUREAUCRAT, SUPPORT AND INNOVATION PROMOTE
INTERPERSONAL RELATIONSHIP IN ORGANIZATION

Hung-Wen Lee
Department of Business Administration
National Chia-Yi University, Taiwan
wayne@mail.ncyu.edu.tw

Abstract

The purpose of this research focused on examining the relationship between bureaucrat, support, innovation promote, and interpersonal relationship. This research uses correlation analysis to discuss the relationship. Samples of this study were integrated banking industry workers in Taiwan. Data were analyzed with relevant statistical techniques. Results show that interpersonal relationship should be improved to establish a suitable culture for effective interpersonal relationship prediction.

Keywords: Bureaucrat, Support, Innovation, Interpersonal Relationship

Introduction

Background and Motive of Research

The banking industry is in a great need of employees. Therefore, organizational members need to quickly join with the organizational culture (OC) in order to achieve good organizational citizenship behavior (OCB) and thereby enhance the competitiveness of banks. Organ (1988) proposes that OC and OCB are highly correlated, and the personal value of members will be assimilated to the organizational value after accepting the OC. Chatman (1991) points out that the

agreement of value provides organizational members a common faith, concept, code, and thinking pattern to accelerate the progress of consensus, promote cooperative behavior, and enhance the job satisfaction and work performance of members. In other words, OC has direct influence on OCB. Thus, the objective of this study is to investigate the correlations between OC and OCB in the banking industry.

Literature Review

Organizational Culture

1. Definitions of OC

Tunstall (1985) proposes that OC is a mixture of common value, behavioral pattern, custom, symbol or mark, attitude, and the code of conduct differs from that of other organizations.

Robbins (1992) emphasizes that OC is a common perception and meaning sharing system making an organization different from others. He emphasized the perceptive aspect of OC and believed that there is shared faith, value and code within the OC allowing employees to identify with the organization.

Daft (2001) defines OC as the collection of value, assumption, faith, ideology and thoughts allowing employees to feel the true value.

2. Classification of organizational culture

(1) Wallach (1983) classifies OC into three main types according to the results of his empirical study.

a. Bureaucratic: A bureaucratic culture is usually found in organizations with a hierarchical structure in which the responsibility and authority is clearly defined, and work is standardized and regularized. As such a culture is generally built up on control and power, organizations adopting the bureaucratic culture are usually stable, mature, and cautious.

- b. Innovative: Organizations adopting the innovative culture usually face dynamic and exciting competitions, and their work is often creative and risky. People with the entrepreneurial spirit or love challenges and are creative are suitable for organizations adopting the innovative culture.
- c. Supportive: The work environment of organization adopting the supportive culture is usually open and harmonious, filling with the warmth of family. As there is great support and trust in the organization, interpersonal relationship is very important.

Organizational Citizenship Behavior

1. Definitions of organizational citizenship behavior (OCB)

(1) Katz and Kahn (1966, 1978) believe that the third organizational behavior includes helping colleagues solve problems, voluntary help for new employees, self-learning to improve work capacity, protection of organizational resources, and voluntary spread of organizational advantages. Organizational behaviors of such kind indicate organizational citizenship behavior; employee behaviors with positive and substantial help for the organization.

(2) Konovsky and Pugh (1994) add that OCB is a kind of employee behavior surpassing the duty requirements and is subject to voluntary judgment and outside of the official pay structure of the organization. Robinson and Morrison (1995) point out from the viewpoint of psychological contract that OCB refers to all behaviors beyond the contracts or agreements signed between employees and employers.

2. Classification of OCB

Farh, Jiing-Lih (1997) classifies OCB into five constructs: organizational identification, altruism, dutifulness, interpersonal harmony, and protection of

organizational resources. The questionnaire of this study was developed according to the following constructs.

- a. Organizational identification (OI): OI refers to the employee's effort to maintain the organizational image, active participation in organizational meetings and activities, and voluntary proposition of constructive solutions for organizational improvement.
 - b. Altruism: Altruism refers the voluntary provision of assistance and solutions for particular organizational personnel (colleagues or supervisors) or non-organizational personnel (customers or suppliers) in areas related to the organization.
 - c. Dutifulness: refers to the heroic behaviors of organizational members surpassing the minimum organizational requirements.
 - d. Interpersonal Harmony: refers to the effort made by employees to prevent political behaviors destructing organizational harmony for seeking personal benefits.
- Protection of organizational resources refers to the effort of made by employee to avoid handling personal affairs during work hours or with organizational resources.

Research Method

Research Hypotheses

- H1: The OC perception of banking industry workers has significant effect on OCB.
- H1-1: The bureaucratic culture perception of banking industry workers has a significant effect on OCB.
- H1-2: The supportive culture perception of banking industry workers has a significant effect on OCB.
- H1-3: The innovative culture perception of banking industry workers has a significant effect on OCB.

Instruments

The research questions were investigated by means of survey. The questionnaire falls into some parts. Part I is the OC scale, proposed by Wallach (1983) including the following three constructs: bureaucratic, supportive and innovative cultures. Part II is the OCB scale, proposed by Farh, Earley, and Lin (1997), covering the following five constructs: organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organizational resources.

Research Results

Sampling

Samples of this study were selected at random from the employees of banking industry workers in Taiwan. Of 1200 questionnaires distributed, 346 copies were received. After deducting 57 invalid samples, there are 289 valid samples, with a valid recovery rate of 24.08%.

Correlation Analysis

1. Correlations Between OC and OCB

Results of Pearson correlation analysis show that all variants are significantly correlated, and the significance falls between $p < 0.01$ and $p < 0.05$. The correlation coefficient between bureaucratic culture and organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organization resources are 0.273, 0.254, 0.197, 0.223, and 0.187 respectively. The correlation coefficient between supportive culture and organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organization resources are 0.602, 0.647, 0.579, 0.658, and 0.273 respectively. The correlation coefficient between innovative culture and organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organization resources are 0.589, 0.474, 0.455, 0.710, and 0.259 respectively. Based on these results, we can conclude the following:

(1) The bureaucratic culture perceived is significantly correlated to all OCB constructs, i.e. organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organizational resources, indicating that H1-1 is supported.

(2) The supportive culture perceived is significantly correlated to all OCB constructs, i.e. organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organizational resources, indicating that H1-2 is supported.

(3) The innovative culture perceived is significantly correlated to all OCB constructs, i.e. organizational identification, altruism, dutifulness, interpersonal harmony, and protection of organizational resources, indicating that H1-3 is supported.

Conclusions and Suggestions

Conclusions

Results of correlation analysis show that OC has significant and positive effect on the OCB of banking industry workers, and H1 is supported. This suggests that when a bureaucratic, supportive or innovative culture is created, employees will identify with the organization better and improve their OCB.

Suggestions

Bureaucratic culture is related to the work pressure perceived by employees, such as the pressure from supervisors or the organization, which involves the leadership style of supervisors and organization. Therefore, it is necessary to suitably specify the work and give employees suitable pressure in order to let employees feel the restrictions and obey the supervisors, and feel the responsibility and obligations in order to achieve the organizational goals.

Supportive culture is related to the interpersonal relationship among employees, such as to whether or not employees interact with one another harmoniously, and the organizational atmosphere is energetic. These are related to the interactive activities and atmosphere perceived by employees. Therefore, it is necessary for organizations to create a good work environment and give employees space for self-determination. This way, employees will have free space to exchange with and help one another.

Innovative culture is related to a complex and changeful organizational environment, such as encouraging employees to think more and accept new concepts, which is related to the employee's acceptance of organizational change. Therefore, it is necessary for organizations to give employees space to solve problems independently in order to develop their critical thinking and innovative thought. Organizations should also give employees clear directions in order to inspire their creativity and enhance their acceptance and learning capacity.

References

- Chatman, J. (1991) Matching people and organizations: Selection and socialization in public accounting firms, *Administrative Science Quarterly*, 36(4), pp. 459-484.
- Daft, L. R. (2001) *Organization Theory and Design*. Australia: South-Western College.
- Farh, Jiing-Lih, Earley P.C., & Lin S. (1997) Impetus for Action: A Cultural Analysis of Justice and Organizational Citizenship Behavior in Chinese Society, *Administrative Science Quarterly*, 42, pp.421-444.
- Katz, D. & Kahn, R.L. (1966) *The Social Psychology of Organizations*. New York, Wiley.

- Konovsky, M. A. & Pugh, S. D. (1994) Citizenship behavior and social exchange. *Academy of Management Journal*, 37(3), pp.155-169.
- Organ, D.W. (1990) The Motivational Basis of Organizational Citizenship Behavior, *Research in Organizational Behavior*, 12, pp.43-72.
- Robbins, S. P. (1992) *Organizational Behavior-concepts, Controversies, and Applications*, 6th Edition, Englewood Cliffs, New Jersey: Prentice Hill.
- Robinson, S.L. & Morrison, E.W. (1995) Psychological Contracts and Organizational Citizenship Behavior: The Effects of Unfulfilled Obligations, *Journal of Organizational Behavior*, 15, pp.245-259.
- Tunstall, W.B. (1985) Breakup of the Bell System: a Case Study in Cultural Transformation, In R.H. Kilmann et al. (Eds), *Gaining Control of the Corporate Culture*, San Francisco: Jossey-Bass, 1985, pp.44-65.
- Wallach, E. J. (1993) Individuals and Organizations: The Cultural Match, *Training and Development Journal*, February.

FROM SUCCESSFUL INNOVATION TO MARKET PROFITABILITY

Yun Ken

Department of Business Administration,
National Yunlin University of Science and Technology, Taiwan

Tung-Yu Tsai

Department of Business Administration,
National Yunlin University of Science and Technology, Taiwan
g9322810@yuntech.edu.tw

Abstract

This study extends the innovation process to a novel invention's launch for profit and focuses on how deferred patents impact the American pharmaceutical industry and profitability at the firm level. We find there are clear relationships between the indexes of patent impact and proxies of profitability such as ROE and EPS and that there is a time lag of 4 years between the indexes of patent impact and ROE, and 5 years between these indexes and EPS. These time lags are longer in the pharmaceutical industry than in other industries, and we suggest that investors regard scientific measures of the quality and quantity of inventive output as useful indicators of the market profitability tied to the impact of patenting.

Keywords: Patent Impact, Patent Performance, Time Lag Effect, Market Profitability

Introduction

The technological and economic quality of patents varies widely (Reitzig 2003 ; 2004). A minority of patents are of high quality, while the vast majority is of low quality (Schankerman and Pakes, 1986). The use of a simple patent count has not been used in the literature because patents vary widely in their importance or value (Trajtenberg, 1990). Firms with many high-quality patents are significantly more successful in terms of the impact of their patents, and successful firms are identified not just by the number of their patents but by how well their competitors affirm and accept their innovations. This study addresses the links between the speed of innovation and the number of citations of that patent made by competitors. In so doing, we examine indicators of patent impact (Table 1) that are related to patent quality.

Sales growth is the most comprehensive surrogate for the success of patent rights (Ernst, 2001), but increases in sales may not actually be related to a patent but can come from other products. Furthermore, patent holders' appropriation on their innovation is not only from sales of innovative products but also royalties of patent rights. We are more interested in exploring how fast these high-quality patents can make money for their shareholders than in overall sales growth. In addition, the

competence of a company is seldom used as a measure of the impact of a patent but may be a more accurate measurement than sales growth for success of innovations.

Griliches (1990) emphasized the insufficient attention to the time-lag phenomenon between patents and subsequent growth of productivity. Ernst (2001) later studied 50 German firms from the machine-tool industry and showed that patent applications can partly incorporate sales increases with a time lag of 2 to 3 years. We further study the correlation between patents and market profitability, including the time-lag effects between patent acceptance and the resulting impact on profit. Our sample from the U.S. pharmaceutical industry has more durable innovation processes, which must be taken into account when analyzing the time-lag effects from innovation to profit.

Literature Review

It is debatable whether patent applications or patents granted have significantly influenced company performance or not (Ernst, 1995). Some early empirical research found no substantial effects between the individual figure of patents granted or of patent citations solely and between financial performance (Narin et al., 1987). Nevertheless, another similar study has claimed that have positive relationship and patents granted or of patent citations and corporate performance (Comanor and Scherer 1969). The mere amounts of patent granted or

citations may not reveal and unfold the changes of inventor's performance achievements thoroughly; therefore, it is a growing awareness that the number of patents granted or patent citations seems to be no more than a plausible or insufficient indicator for valuation of technical research output.

The technological and economic quality of patents is extremely heterogeneous (Mansfield et al, 1981 ; Hall et al, 2001) . Evidently, the little minority patents are of high quality and the vast majority of low quality (Schankerman and Pakes, 1986) . The use of simple patent count in economic research has been seriously obstructed by the fact that patents vary enormously in their importance or value (Trajtenberg, 1990) . Firms with many patents of high quality are significantly more successful with regard to all patent impact and will not just represent a summation of patent numbers but also of other competitors' affirmations and acceptance of their technology innovations. However, former studies have divulged that mere amounts of patents granted or citations have no sufficient correlations with corporate performances. More deliberations on those linkages of innovative rapidity and competitor citations with patents granted will be taken account of this study. Hence, we intend to employ some analogous indicators about patent impact (Deng et al., 1999 ; Thomas et al., 2001) that consider more about patent quality to replace the above two variables.

So far the sales growth is a most comprehensive surrogate for the value of patent rights (Scherer, 1965 ; Jaffe, 1986 ; Ernst, 2001) , but seems to be not a proper one. The boosting of sales may come from other company's products, besides; financial statements can separate sales of products with innovative patents from total sales amount. Furthermore, patent holders' appropriation on their innovation is not only from sales of innovative products but also royalties of patent rights (Kim, 2004) . Other proxies are market value , gross profit or the stock return of a patent holder's company (Jaffe, 1986 ; Harhoff et al., 1999 ; Deng et al., 1999 ; McMillan et al., 2005) . The market value or stock price will be evermore influenced by systematic fluctuations and business cycles. We are more anxiously to explore how fast these high quality patents can make money for their shareholders? In addition, the competence of profitability of a company seems to be scarcely used in this field. We think it may be a more accurate measurement for the value of patent rights.

The insufficient attention of the time-lag phenomenon between patent rates or patent stocks with subsequent growth of productivity has been accentuated in a previous related study (Griliches, 1990) . Later the only research study of its kind of 50 German firms from the machine-tool industry was chosen for exploring the above assertion, and it is showed that patent applications can partly incorporate sales increases with a time-lag of 2 to 3 years after the priority year in firm level (Ernst,

2001) . Hence, when we study the correlation between patent impacts with profitability in the same level, it should be accordingly observed to include the time-lag effects between our dependent and independent variables. Extraordinarily, our sample that the U.S. pharmaceutical industry needs more durable innovation processes to convert patented inventions into innovations (Achilladelis et al., 2001 ; Takayama et al., 2002 ; DiMasi et al., 2003) . This must be taken into account in the analyses of the influence of patents on downstream changes in economic performance parameters. The output effect of patents should result in a positive lagged correlation between patent and performance variables. These observations led us to test the following hypotheses:

H₁: There is a positive correlation between patent impacts and some firms' financial performance indicators.

H₂: The impact of patents leads to a subsequent improvement of a firm's financial performance.

Data, Methodology and Results

The sample of firms for this study is drawn from the Compustat Research Insight database. Because their financial data was mostly intact, we chose pharmaceutical companies from 2008 and obtained 255 samples. After deleting those companies whose financial materials are not fully gauged, 118 drug makers were left.

We searched for patent data from the Derwent Innovative Index for each of these 118 companies for the ten years from 1999 to 2008. Next, we calculated the patent impact index, deleted the companies for which we were unable to obtain its patent materials, and were left with 86 drug makers in our sample.

Measurements of Financial Performance

Although a similar study has proposed that sales are a good proxy for surveying innovation success at the firm level (Ernst, 2001), those firms whose income statements indicate soaring sales are not guaranteed profits or surpluses (Prescott et al., 1986) . In order to explore whether profitability will be a surrogate for a company's innovation success, we deployed five measurements of firm profitability to gauge the relationship between patents and profitability: Ratio of net income to net sales (PM), Ratio of gross profit to net sales (GPOS), Return on assets (ROA), Return on equity (ROE) and Earning per share (EPS).

Surrogates of Successful Innovation

While the actual patent counts are not informative regarding market success for innovations, there is a close connection between citation-based patent indices and independent measures of the social value of innovations. Hence, we assume that the more citations a drug maker receives for its patents, the more critical and successful its patents are compared to those of its peers. Furthermore, the more quickly the drug

maker increases its novel patents, the more innovation speed the drug maker has. The indicators of patent impacts shown in Table 1 may be more reliable indices than are patents granted and patent citations in assessing a drug maker's quantity of successful innovations.

Table 1. Indicators of Patent Success

Code	Indicator	Measurement	Description
PN_A	Number of Patents	Innovative output	PN_A patent granted to a company within one year
$CCP=C_A/PN_A$	Average Citations per Patent	Dominance of the patent portfolio	C_A number of citations of a patent granted to a company within one year
$CII= CCP / (\sum C_p / \sum PN_p)$	Current Impact Index	Patent quality level	$\sum C_A$ number of citations of a patent granted to the pharmacy industry within one year
$TS_A= CII \times PN_A$	Technological Strength	Weighted patent quality	Average number of citations of a patent granted to a company within one year
$TCT= \sum T_{AN} / \sum PN_A$	Average Technology Cycle Time	Innovation speed	$\sum T_{AN}$ average time between patent granted and patent cited for a company within one year

1. PN : Comanor and Scherer, 1969 ; Jaffe, 1986
2. CCP : Narin et al., 1987 ; Trajtenberg, 1990
3. CII : Hirschey et al., 2001 ; Thomas et al., 2001 ; McMillan et al., 2005
4. TS : Li et al., 2002
5. TCT : Deng et al., 1999 ; Thomas et al., 2001 ; McMillan et al., 2005

First, every dependent variable (PM, GPOS, ROA, ROE, EPS) was measured in 2008, and every predicted variable (PN, CPP, CII, TS, TCT) was collected from 1999 to 2008. By determining the P-values of the significance level in multi-regression models using the following five formulas, we observe the correlation between the dependent and independent variables.

$$PM_{2008} = a_0 + a_1 PN_{2008-k} + a_2 CPP_{2008-k} + a_3 CII_{2008-k} + a_4 TS_{2008-k} + a_5 TCT_{2008-k} \quad (1)$$

$$GPOS_{2008} = a_0 + a_1 PN_{2008-k} + a_2 CPP_{2008-k} + a_3 CII_{2008-k} + a_4 TS_{2008-k} + a_5 TCT_{2008-k} \quad (2)$$

$$ROA_{2008} = a_0 + a_1 PN_{2008-k} + a_2 CPP_{2008-k} + a_3 CII_{2008-k} + a_4 TS_{2008-k} + a_5 TCT_{2008-k} \quad (3)$$

$$ROE_{2008} = a_0 + a_1 PN_{2008-k} + a_2 CPP_{2008-k} + a_3 CII_{2008-k} + a_4 TS_{2008-k} + a_5 TCT_{2008-k} \quad (4)$$

$$EPS_{2008} = a_0 + a_1 PN_{2008-k} + a_2 CPP_{2008-k} + a_3 CII_{2008-k} + a_4 TS_{2008-k} + a_5 TCT_{2008-k} \quad (5)$$

$$K = 0, 1, 2, 3, \dots, 9$$

A 95% confidence level one tail test revealed that PM, GPOS, and ROA do not have statistical significance with the predicted variables in the 10 years studied but that ROE and EPS have statistical significance with five independent variables (Table 2). This finding supports H₁.

Table 2. Significance Test of Each Regression Model (P-value)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
PM	0.496	0.853	0.971	0.426	0.306	0.379	0.983	0.407	0.397	0.578
GPOS	0.572	0.955	0.976	0.565	0.305	0.473	0.998	0.465	0.677	0.635
ROA	0.533	0.632	0.664	0.306	0.098	0.528	0.489	0.766	0.173	0.419
ROE	0.032**	0.046**	0.736	0.039**	0.063*	0.023**	0.026**	0.043*	0.407	0.046*
EPS	0.051*	0.036**	0.039**	0.069**	0.012*	0.018**	0.021**	0.041**	0.447	0.044**

* significance level > 0.1 ** significance level > 0.05 (one tail test)

After verification of the significance levels under the 95% confidential interval, we found that EPS and ROE reached statistically significant levels. Following that, we selected these two independent variables to carry out the next step of the multiple regression analyses. We deployed the EPS and ROE of 2008 for the P-values of the significance test upon the multi-regression models with 5 independent

variables (PN, CPP, CII, TS and TCT) from 1999 to 2008 separately, and obtained the results shown in Tables 3 and 4.

Table 3. Regression Results of ROE With Impact of 1999-2008 Patents

year	1999**	2000**	2001	2002**	2003*	2004**	2005**	2006**	2007	2008**
D-W test	1.982	1.775	1.702	1.823	1.996	1.988	1.765	2.105	1.832	1.948
R ²	0.149	0.155	0.041	0.160	0.145	0.181	0.177	0.158	0.059	0.155
Adjusted R ²	0.084	0.091	-0.021	0.098	0.082	0.127	0.116	0.094	0.005	0.091
P-value	0.032	0.046	0.736	0.039	0.063	0.023	0.026	0.043	0.407	0.046

* significance level > 0.1 ** significance level > 0.05 (one tail test)

Table 4. Regression Result of EPS With Impact of 1999-2008 Patents

year	1999*	2000**	2001**	2002*	2003**	2004**	2005**	2006**	2007	2008**
D-W test	1.752	1.538	1.771	1.897	1.998	1.913	1.862	2.128	1.722	1.887
R ²	0.143	0.164	0.159	0.131	0.196	0.184	0.179	0.164	0.057	0.152
Adjusted R ²	0.078	0.101	0.096	0.062	0.141	0.132	0.125	0.111	0.003	0.088
P-value	0.051	0.036	0.039	0.069	0.012	0.018	0.021	0.041	0.447	0.044

* significance level > 0.1 ** significance level > 0.05 (one tail test)

According to the results presented in Tables 3 and 4, all 10 Durbin-Watson statistics for ROE and EPS are greater than 1.5, so our samples are not serious to represent the phenomenon of autocorrelation. Under the 95% confidential interval, our findings show that two proxies for profit-making, ROE and EPS, are significantly related to the impact of patents. Figures 1 and 2 show the distributions of R² and adjusted R² of ROE, EPS, respectively. These two pairs of curves show that R² and adjusted R² rise continuously after 1999 and reach their highest levels by 2004 (for ROE) and 2003 (for EPS). The curve represents the explanatory ability of the proxies

for the impact of 1999-2008 patents on the 2008 ROE / EPS. This finding is illustrated in Figure 1 and 2, which also show that the explanatory ability of patent impact proxies upon the company's profitability has a time-lag. This finding also supports H₂.

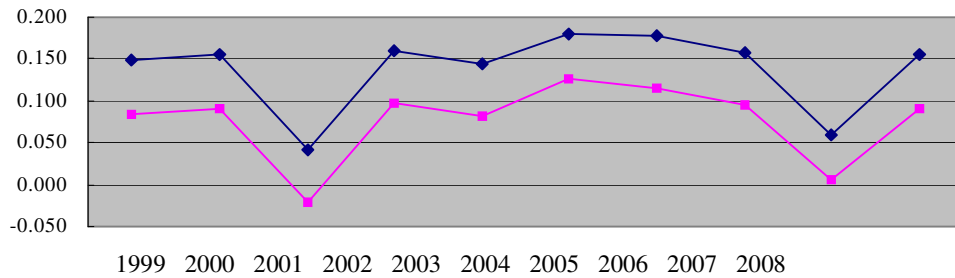


Figure 1. The Distributions of R² (Blue) and Adjusted R² (Red), P-value > 5% (explanatory ability of the 1999-2008 patents' impact on 2008 ROE)

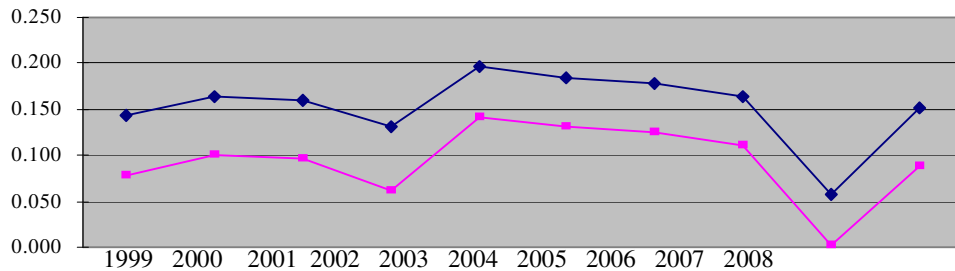


Figure 2. The Distributions of R² (Blue) and Adjusted R² (Red), P-value > 5% (explanatory ability of the 1999-2008 patents' impact on 2008 EPS)

Thus far, as few slight disparity of striking effect has not been up to 5% as we concerned in the model, it may not reach the level of statistical significance. When we lift the significance level to 10% and draw the distribution of the R² and adjusted R² (Figures 3 and 4), the explanation ability of the preceding 1- to 10-year patent impact

measurements on the 2008 ROE and EPS rise steadily after 1999. After 1999, the R^2 and adjusted R^2 in 2004 (for ROE) and 2003 (for EPS) reach their highest levels. Thus, the measurement of the impact of patents from 2004 and 2003 had significant explanatory ability with the ROE / EPS of 2008, and also demonstrated a deferred impact.

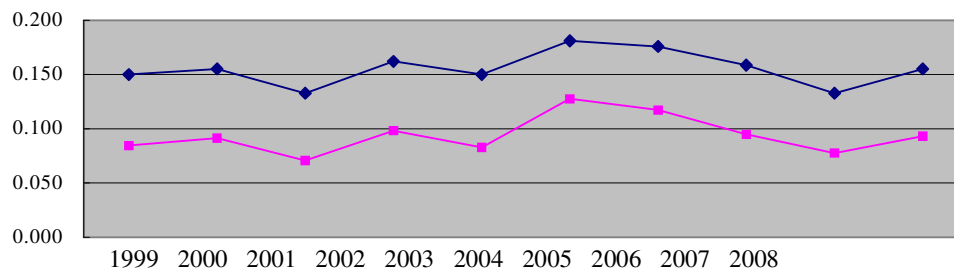


Figure 3. The Distributions of R^2 (Blue) and Adjusted R^2 (Red), P-value>10% (explanatory ability of the 1999-2008 patents' impact on 2008 ROE)

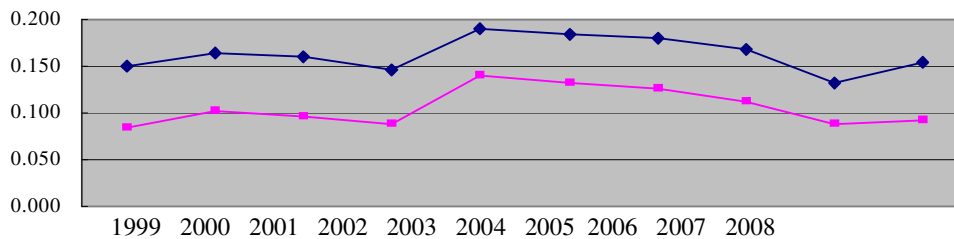


Figure 4. The Distributions of R^2 (Blue) and Adjusted R^2 (Red), P-value>10% (explanatory ability of the 1999-2008 patents' impact on 2008 EPS)

Conclusions

First, among the profitability measurement indicators of the American pharmaceutical industry at firm level, ROE and EPS have a noticeable correlation with our proxies for patent impact. Our research shows the correlation between

indicators of patent impact and two striking profitability measurements also has a time-lag effect on ROE, since the R^2 and adjusted R^2 values reached their peak in 2002. The R^2 and adjusted R^2 values reached their peaks in 2002 under a 90% confidence level. Hence, it can be argued that the impact of patents on ROE is deferred for 4 years and the impact of patents on EPS is deferred for 5 years.

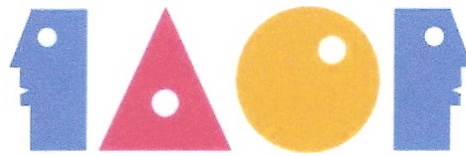
Second, one harsh critique is lifted, that assessments of intellectual property from investment financial institutions are given little credit (Rivette and Kline, 2000) . These results suggest that investors should regard scientific measures of successful inventive output as useful indicators of how market profitability is tied to the impact of patents. This paper is the first empirical study on how certain characteristics of the impact of patents contribute to a patent holder's profitability, and fundamental questions remain as to whether patent statistics, such as patent citation statistics of scientific linkage to research papers, represent the real state of a company's level of innovation. Such citations may be only a measurement of whether a patented technology is a cutting-edge innovation vs. coming from basic research.

References

- Achilladelis, B. and Antonakis, N. (2001) The dynamics of technological innovation: the case of the pharmaceutical industry. *Research Policy*. 30, 535-588.
- Adam, J. B. (1986) Technological opportunity and spillovers of R&D: evidence from firms' patents, profits, and market values. *American Economic Review*. 76, 984-1002.
- Comanor, W. S. and Scherer, F. S. "Patent statistics as a measure of technical change, *Journal of Political Economy*," Vol.77, pp.392-398, 1969.
- Deng, Z., Lev, B., and Narin, F. (1999) Science and technology as predictors of stock performance. *Financial Analysts Journal*. May/Jun, 20-32.
- DiMasi, J. A., Hansen, R. W. and Grabowski, H. G. (2003) The price of innovation: new estimates of drug development costs. *Journal of Health Economics*. 22, 151-185.
- Ernst, H. (1995) Patenting strategies in the German mechanical engineering industry and their relationship to company performance. *Technovation*. 15, 225-240.
- Ernst, H. (2001) Patent applications and subsequent changes of performance: evidence form time-series cross-section analyses on the firm level. *Research Policy*. 30, 143-157.
- Griliches, Z. (1990) Patent statistics as economic indicators: a survey. *Journal of Economic Literature*.18, 1661-1707.
- Hall, B. and Ziedonis, R. H. (2001) The determinants of patenting in the US semiconductor industry, 1980–1994. *RAND Journal of Economics*. 32, 101-128.
- Harhoff, D., Narin, F., Scherer, F. M., and Vopel, K. (1999) Citation Frequency and the Value of Patented Inventions. *The Review of Economics and Statistics*. 81, 511-515.

- Hirschey M. and Richardson, V. J. (2001) Valuation effects of patent quality: A comparison for Japanese and U.S. firms. *Pacific-Basin Finance Journal*. 9, 65-82.
- Kim, Y. (2004) Market structure and technology licensing: evidence from US manufacturing. *Applied Economics Letters*. 11, 631-637.
- Li, M. and Simerly, R. L. (2002) Environmental dynamism, capital structure and innovation: an empirical test. *International Journal of Organizational Analysis*. 10, 156-171
- Mansfield, E., Schwartz, M. and Wagner, S. (1981) Imitation costs and patents: an empirical study. *The Economic Journal*. 91, 907-918.
- McMillan, G. S. and Thomas, P. (2005) Financial success in biotechnology: company age versus company science. *Technovation*. 25, 463-468.
- Narin, F., Noma, E. and Perry, R. (1987) Patents as indicators of corporate technological strength. *Research Policy*. 16, 143-155.
- Prescott, J. E., Kohli, A. K. and Venkatraman, N. (1986) The market share-profitability relationship: an empirical assessment of major assertions and contradictions. *Strategic Management Journal*. 7, 377-394.
- Reitzig, M. (2003) What determines patent value? Insights from the semiconductor industry. *Research Policy*. 32, 13-26.
- Reitzig, M. (2004) Improving patent valuations for management purposes- validating new indicators by analyzing application rationales. *Research Policy*. 33, 939-957.
- Rivette, K. G. and Kline, D. (2000) Discovering new value in intellectual property. *Harvard Business Review*. 78, 54-66.
- Schankerman, M. and Pakes, A. (1986) Estimates of the value of patent rights in European countries during the post 1950-period. *The Economic Journal*. 96, 1052-1076.

- Scherer, F. S. (1965) Corporate inventive output, profits, and growth. *Journal of Political Economy*. 73, 290-297.
- Takayama, M. and Watanabe, C. (2002) Myth of market needs and technology seeds as a source of product innovation-an analysis of pharmaceutical new product development in an anti-hypertensive product innovation. *Technovation*. 22, 353-362.
- Thomas, P. and McMillan, G. S. (2001) Using science and technology indicators to manage R&D as a business. *Engineering Management Journal*. 13, 9-14.
- Trajtenberg, M. (1990) A penny for your quotes: Patent citations and the value of innovations. *RAND Journal of Economics*. 21, 172-187.



ENTERPRISE RISK MANAGEMENT

Dr. Pranee Chitakornkijasil
Graduate School of Business Administration
National Institute of Development Administration (NIDA), Thailand.
wayne.s@nida.ac.th

Abstract

In this study, several aspects of managing risk are considered. We address the meaning of risk management, followed by a discussion of some of the main objectives of risk management. The process of risk management is composed of identifying the causes of loss, the analysis of loss uncovered, finding risk technique alternatives, and choosing the best risk management practices. As well, the control and implementation of risk management programs are studied. Furthermore, a comprehensive risk management program is considered. Then, we address various factors of risk management programs along with the development of risk management programs. Finally, risk management appraisal areas are discussed, and critical components for getting started are detailed.

Key Words: Enterprise Risk, Management

Managing Risks

Even when none of the risks can be identified, there are strategies to minimize losses. The strategy is to develop business environments that minimize the

probability of an event occurring by preparing plans to deal with foreseeable events and guaranteeing that valuable assets are physically secured to get rid of any hazards in the workplace. To create an equitable and safe environment, workers are discouraged of inappropriate behavior and work, and are encouraged in desired behavior. Valuable assets of the company must be kept in secure areas. When valuable assets are used, access to them must be carefully controlled by management. Only workers who absolutely need to should be allowed access to valuables at any given time.

Tangible Property Risk Management

Tangible property risk management depends on the nature of property. Land and buildings are able to be destroyed or damaged by various events. Equipment can be stolen. Small items of high value could be stolen by workforce, consumers, vendors, or others. The specific methods to monitor each risk are specialized to the specific asset at risk.

Intangible Property Risk Management

Intellectual property rights concern legal rights of unique features of services or products. The rights of application unique features are legally protected in various methods such as: keeping the process secret, trademark or copyright, and patent.

The Meaning of Risk Management

Risk Management is a process that indicates losses faced by an organization and the most appropriate techniques for treating such discoveries. Because risk is ambiguous and possesses different meanings to identify potential losses, an uncovered loss is any circumstance or situation where loss is possible, regardless of whether an actual loss occurs. For example, manufacturing plants may be damaged by floods or earthquakes, defective products that may come from lawsuits against the enterprise, as well as theft of firm property due to inadequate security.

Risk Management Objectives

Risk management has two essential objectives, as follow:

- a. Post-loss goals
- b. Pre-loss goals

Post-loss Goals

Risk management possesses certain objectives after a loss occurs. These objectives are survival, stability of earnings, continued operation, social responsibility, and growth.

The most critical post-loss goal is survival of the enterprise. Survival refers to that time after loss occurs, when the company is able to resume at least partial operations within a reasonable time period.

Another post-loss goal is to continue operating. For some enterprises, the ability to operate after loss is critically important. For example, a public utility enterprise must continue to give service, and continue to operate after loss. Additionally, a company can be lost to competitors. Also, another post-loss goal is stability of earnings. However, a company must have a hefty cash reserve to accomplish this objective, for example, to operate at another location while stability of earnings are down. Finally, another post-loss goal is continued growth of the company by creating new markets and products, or by merging with other enterprises.

Eventually socially responsible policies to minimize the effects that loss may have on another society and other persons need to be established. One critical loss may affect suppliers, employees, the community, as well as the company's creditors and financial backers.

Pre-loss Goals

Critical objectives before loss occurs involve concerns for the economy, meeting legal obligations, and putting in place practices to reduce anxiety. The first objective is that the company ought to prepare potential losses in the most economical way. This preparation concerns an analysis of insurance premiums paid, the cost of safety programs, and the cost of handling losses. The second objective concerns the reduction of anxiety. Certain loss discoveries can cause great worry and fear for key

executives. The last objective is to meet any legal obligations the firm may have. For example, government regulations require companies to install safety instruments to protect workers from harm, to label consumer goods appropriately, and to dispose of hazard waste materials in a safe and appropriate manner.

Risk Management Processes

Identifying Loss

This step concerns the analysis of the following potential losses:

- Business income, such as extra expenses and continuing expenses after an initial loss.
- Property loss, such as plants, building, supplies, equipment, data, inventory, computers, and accounts receivable.
- Liability loss, for example environmental pollution, defective products, e-mail transmissions.
- Crime loss, such as employee dishonesty and theft, computer crime and internet tampering, and theft of intellectual property.
- Foreign loss uncovers, such as: foreign currency risks, political risks.
- Public image and reputation of the company, for example a situation

where a

manager has various sources of information to identify losses such as financial statements, physical inspections of company plants, risk analysis questionnaires, and flowcharts on delivery and production bottlenecks.

Major risk management problems come from rising worker's compensation costs, consolidation and effects of mergers, and financial risk through the capital markets.

Some examples are:

- Employee benefit loss such as failure to comply with government regulations, health and group life and retirement plan losses, failure to pay promised benefits.
- Human resources loss such as disability of key employees, death, unemployment, retirement, or disease experienced by workforces.

Identifying risk happens when management professionals become aware of risks in the environment that have potential for loss, such as loss of financial assets through liability judgments, losses of property and physical plants, human losses, and intangible losses to reputation and public image. Risk management professionals utilize various information sources to identify potential risks such as incident reporting (when an employee's report of an accident is not consistent). Eventually, participation with line managers and other staff members can lead to excellent sources of information about potential risks, of which risk management professional may be

previously unfamiliar. Risk analysis concerns determining the potential severity that such a loss will occur. Risk management professionals are required to give priority to the greatest potential risk of financial loss, unless the total cost of the incident is insignificant. Risk analysis is based on the training, experience, and instincts of risk management professionals, and concerns certain data and objective sources of information to evaluate a given risk.

Analyzing Loss

Analyze loss concerns an estimation of the severity and frequency of loss. For example, a loss which has the potential for bankrupting the company is much more important in a risk management program with a small loss potential. Moreover, the relative severity and frequency of each loss must be estimated so that the risk manager is able to choose the most appropriate technique for handling each uncovered loss. For example, if certain losses occur regularly and predictably, management can establish a budget and treat it as a normal operating expense. The risk manager must be aware of both loss severity and loss frequency, with severity being more important because a single loss could wipe out the company. Therefore, maximum possible loss must be estimated.

Find Risk Technique Alternatives

Risk management techniques concern the range of selection available to the risk management professionals in handling a given risk. Risk treatment strategies have two categories: risk control and risk financing. Risk control concerns preventing losses, risk financing involves paying losses that occur. Risk Control concerns the following techniques:

Loss decreasing. Loss decreasing concerns risk management techniques for maintaining and establishing a relation with the company's main consumers, that limit the severity of a loss that has already occurred. Other loss reduction concerns prompt incident investigation, the establishment of written plans for disaster, and supporting emergency management. Such examination should encourage an early settlement if the examination is unfavorable. Loss decreasing means measures that reduce the severity of a loss after it occurs.

Loss hindrance. Loss hindrance is composed of policy, staff education and revision, as well as procedure review.

Financial risk. Financial risk concerns ways to generate funds to pay for losses that risk control techniques can not totally eliminate. Financial risk means techniques that provide for the funding of losses after they occur.

Risk perseverance. Risk preserve concerns managing an identified risk, and preparing financial consequences of such losses, as well as taking the opportunity to

evaluate appropriate risk financing strategies. These risks are not able to be reduced, or avoided. Risk perseverance refers to that company which retains part or all of the losses that result from a given loss, is aware of the loss uncovered, and plans to retain part or all of it. Passive retention means the failure to identify a loss, forgetting to act, or failing to act. Retention is able to be effectively applied in a risk management program under certain conditions, as follows: No other method of treatment has been acquired, losses are highly predictable, and the possibility of loss is not serious.

Establishing perseverance levels. If retention is applied, the risk manager must establish the company's retention level, which is the amount of losses that the company shall retain. A strong company is able to have higher retention levels than another one whose financial position is weak. To establish retention levels, a company must be able to determine the maximum uninsured loss it can absorb without adversely affecting the firm's earnings. Besides, an enterprise must be able to determine the maximum retention as a percentage of the company's net working capital, although it does not reflect this overall financial position for absorbing loss. If retention is applied, the risk manager must have various methods for paying losses, as follows: Credit line, current net income, and funded reserve. Loss preserve means the ability to measure loss in order to reduce the frequency of a particular loss, for

example, truck accidents, lawsuits from defective products, and quality control checks.

Disadvantages and advantages of retention. The critical advantages are as follows: Lower expenses such as general administrative expenses, loss-adjustment expenses, taxes, and loss control expenses. Concerning retention disadvantages, some critical issues are higher expenses in areas such as the cost of safety engineers, less frequent losses, as well as saving money.

Revealing possible escapes. An escape is the risk control technique to eliminate any possibility for the loss to occur. Controlling risk exposure has a high cost of loss of the company's mission's effectiveness, and loss in revenues, market share, consumer satisfaction, and human relations, which may be less costly to retain or to invest in than the benefits of risk management. To reveal escape means that a certain loss uncovered is never acquired. For example, flood losses are able to be avoided by not building a new plant in a floodplain. A pharmaceutical company that sells a drug with dangerous side effects can withdraw the drug from the market. The critical advantage of avoidance is that the chance of loss is reduced to zero if the loss uncovered is never acquired. Moreover, the chance of loss is eliminated or reduced because the product or activity that produces a loss has been abandoned. However, the

company may not avoid all losses. For example, one day there will come a death of a key executive.

Choosing the Best Risk Management Techniques

Choosing the best risk management techniques for a special situation has two parts. The first one needs forecasting of the effects of available risk management alternatives to support an organization's ability to fulfill its goals. The second one is defining criteria of measurement to determine how much each alternative risk management technique contributes to the organization's objectives in a cost effective way.

Controlling and Implementing Risk Management Programs

Risk Management Policy

A risk management policy describes the risk management objectives and firm policy with respect to treatment of losses uncovered, such as assigning the risk manager greater authority and establishing standards of the risk manager's performance.

Cooperation with Other Departments

Each functional departments is extremely essential in identifying losses, such as:

- marketing: packaging is able to protect against liability lawsuits, and safe distribution can prevent accidents.
- production: quality control is able to protect against liability lawsuits, product defects, and an effective safety programs is able to reduce accidents.
- finance: information shows how losses disrupt profits and cash flow.
- accounting: internal accounting controls are able to reduce theft of cash.
- human resources: responsible to workforce pension programs, benefit programs, firm's hiring, safety programs, dismissal policies and promotion.

The implementation process concerns both technical risk management decisions that are decided by risk management professionals and the related decisions made by other managers in organizations to implement risk management technique and to select appropriate policy limitations.

Periodic Evaluation and Review

Safety programs, risk management costs, and loss-prevention programs must be carefully controlled. The final step in the risk management process is to evaluate and control the effectiveness of the risk management program by assessing its

appropriateness and the adequacy of the techniques being employed to analyze, identify, and treat risks. Risk management professionals are required to prepare a comprehensive annual report of risk management efforts and new program developments.

A Comprehensive Risk Management Program

Organizations and their members, as well as others, have often sought ways to reduce and identify the risks that threatened their existence. Historically, when societies developed into industrialized economies, organizations and individuals continued to find ways to understand and anticipate risks, to protect valuable property from such threats, and to establish mechanisms to transfer financial consequences of loss through policies of insurance. Moreover, risk management concerns the concept of enterprise risk management and complex legal, political, business, and financial risks. While risk management concerns more strategic orientation, risk management professionals take on new roles as chief risk managers, hoping to foster diverse work experiences, broad-based businesses, higher education, and technical and financial skills. Risk management professionals have a responsibility for investigating, analyzing, and maintaining data in order to improve performance. An effective risk management program needs scope sufficient enough to cover all applicable categories of risk like key structural elements, appropriate risk strategies, and written procedures

and policies. Developing a comprehensive risk management program depends on several special considerations. An effective risk management plan can build key structural elements that allow the risk management professional to enforce important changes in organizational policies. The program must define the scope of risks to be managed and any potential liability or threat of loss. Risk management strategies concern various techniques employed to reduce or prevent potential losses and preserve the organization's assets. A set of written procedures and policies guarantees program consistency and uniformity, and assists in communication of the program to various affected parties.

Various Factors of Risk Management Programs

The exact structure of an organization's risk management program depends on the complexity and size of its functions and other services that it offers. Several key structural components are needed for risk management programs to succeed. Whether a firm is just beginning to organize its risk management program or expand an existing program, attention to these structural elements will ensure that the program has a solid foundation.

Coordination

Organizations ought to establish both informal and formal mechanisms for the coordination of risk management programs with other functions and departments. The

risk management professional should have communication and reporting relationships with key individuals within the organization:

The chief executive officer (CEO) provides a critical link to the entity's governing board and offers support for the risk management program. The CEO serves as the key decision maker for many activities critical to the risk management program. Moreover, the CEO must guide the team of senior managers who are responsible for the development of new business opportunities, acquisitions, and mergers.

The financial chief ought to have multiple financial risk responsibilities and offer support for valuable information for the risk management program. The financial chief depends on information provided by the risk management professional to make appropriate decisions regarding risk-financing activities.

The quality management or performance improvement director provides an important source of information. The performance improvement director can assist a risk management professional who lacks training in analyzing and interpreting information.

The compliance officer can help the development of policy and staff education efforts related to regulatory and legislative initiatives.

The safety officer must be responsible for assisting risk management professionals in hazardous materials management, performing fire safety and employee safety activities, emergency preparedness, and is one who chairs the organization's safety committee. The safety officer is a vital source of organization problem solving and risk management information.

Authority

The risk management professional must have sufficient respect from others, and authority in practice, procedure and policy to fulfill the objective of the risk management program. Daily, the risk manager must deal with highly sensitive and confidential information that directly affects the organization's financial status and public image. The risk management professional is responsible for coordinating risk management activities with members and outside parties, as well as with employees and managers at all levels of the organization. Then, the risk management professional's position ought to be relatively high in the organization's hierarchy. Ideally, the risk management professional must report directly to the CEO or the senior administrative management team. A risk management professional's organizational rank is positioned below the department manager, which causes difficulty in dealing with staff and department managers. They are also faced with difficulty in obtaining access to senior management and other outside parties.

Financial risk and insurance program administration are handled by the organization's finance department, and compensation programs are managed by human resources personnel; but, safety programs are managed by a maintenance manager. Although this division of labor may be an efficient portioning of the workload needed for a successful risk management effort, it creates special challenges when creating an identity for those activities and establishing ownership of risk management functions. It is difficult to obtain the wide range of expertise to fulfill their risk management obligations and to stay on top of rapidly changing environments, as well as complex regulatory and legal developments that affect the field.

Accountability

When risk management professionals require sufficient authority to do assigned functions, they ought to be held accountable for that performance. What is needed is annual performance evaluations which assess the risk management professional's achievement of measurable, specific risk management goals. The risk management professional ought to prepare an annual report to senior management of risk management program activities, as well as document progress made toward established goals.

Communication. Risk management professionals must be provide others with information on proposed mergers, joint ventures, and acquisitions. The risk

management professional can advise senior management on the management of various new business arrangements and supports.

Visibility. The risk management professional ought to be highly visible. No one can work every function of a comprehensive risk management program. Therefore, it is important function for the organization's risk management professional, and must be carried out through raising consciousness, increasing communication, and providing education for risk management practices. The risk management professional's position ought to be structured to enhance opportunities for interaction with others committees, participation in activities such as employee orientation and access to organization-wide communication mechanisms, as well as help staff in offering service.

Development of Risk Management Program

The principles that apply to risk management must adapt to guarantee cost-effective care. Interdependence between financial goals and organizational strategy must be integrated into risk management program development, and satisfy the changing consumer base. Within one organization there is a need to take different steps in assessing risk management in different areas. Various risk management program structures should be considered based on organizational size, activities, and scope of services, locations, and available resources.

Responsibility for Defined Risk Management Activities and Services. The responsibility of risk management depends on multiple departments.

Related Risk Management Functions. Every large organization needs an experienced risk management professional, and resources. Knowledge and experience in safety, plant engineering, finance, and claims are especially helpful in large organizations. Risk management involves strategic planning, branding, and marketing. One person should have responsibility for risk management, quality improvement, safety, disaster planning, and control.

Consultative and Outsourcing Structures

At limited times, an organization may select to supplement its risk management functions, and facilitate communication. Consultative and outsourcing structures are generally applied during times of acquisition, merger, or management change. The outsourced organization may become the risk management department. All risk management activities need to be part of the organization's strategic plan and mission.

Risk Management Appraisal Areas

A critical factor is that risk assessment methodology might vary. Organization and individuals must clearly communicate the results and recommendations.

Areas for Assessment

Because assessments may take time, after evaluating basic organizational structures, we ought to begin with high risk, high visibility areas, and high volume, which reflects the organization's status. Generally, the organization's current business and services relationships are essential in identifying the areas for assessment. The assessment process ought to include the organization base, assessing it from an operational to a business perspective. This process possesses a systematic review of the organization's functions, budget, data, and a survey of perceptions about the effectiveness of system and processes already in place.

Resolving current systems. The assessment is concern about analyzing systems that are already in place in order to determine current effectiveness, minimize risk, and identify responsibilities, key contacts, types and level of risk financing, risk management activities, and contractual relationships such as orientation, policies, and job and trust requirements. These must be integrated into current organizational structures and quality and safety programs, for example:

- Assessment of the organizational philosophy, including core values and practice.
- Information management methodologies, computerized access to information, as well as other information issue related to release and retention.

- Technology problems with selection, user training, maintenance, equipment systems, product, and level of support technology.
- Management protocols.
- Licenses, accreditations, certifications, or other designations of the organization's participants.
- Structure, effectiveness, quality and integration of the safety management program.
- Scope and degree of service types, and the what and where of reporting relationships.
- Staff relationships: contracted, employed, networked, independent, or consulting staff issues.
- Emergency management and relationship protocol in external organizations.
- Results of inspection by regulatory agencies, loss assessment data, and orientation and trust processes for staff, both initially and at reappointment.
- Partnered subsidiaries or others associated with the organization.
- Level of consistency in applying the system throughout the organization.

- Educational relationships: types and levels of informal or formal agreements.

Assessing agreement. Risk management programs should meet organizational needs, and provide support for meeting the requirements of outsiders. The demand in marketing management may not come from a list of reporting provisions and activities, but from need accreditations. Regulatory agency rules and processes may be in risk management program development and expansion. One must first review and analyze the most recent findings of all external reviews, surveys, and inspections, as well as any reports from consultants. These reports and the status of the response must be taken in action, along with appropriate standards issued by various outsiders are to be applied as assessment tools that can assist in planning for improvement and in evaluating the risk management program.

Reviewing the Appraisal

Assessments are always identified risk management program opportunities for improvement and strengths. Analysis may concern frequency, severity, and other areas identified for improvement that have an effect on the organization's strategic plan. Good practice without documentation may be assessed as both an information weakness and as a practice strength.

Establishing priorities for program implementation. Set risk management programs may undergo continuous reassessment especially when new areas are added. Regulations and severe loss must have immediate attention. Organizational emphasis on what the mission and the strategic plan require are to be addressed first. Some risk management activities that seem less important may require initiation for success in high impact areas, for example, the application of user friendly reporting. Such a project must be supported by various areas and be multidisciplinary in the organization, which is able to lead to a quality improvement database. In establishing priorities for program implementation, the risk management professional ought to clearly define the desired outcome. During analysis, the risk management professional ought to be aware of the organization's weakness and strengths, and expansions or improvements need to be accomplished. The result of inaction or action must be clearly defined in relation to the direct effect on the organization.

Critical Components for Getting Started

For any risk management program to accomplish its goals, various key components must be in place. Organizational commitment roles of acceptance and program encouragement by various leadership, beginning with the board, are necessary. Commitment is always shown through assignments of authority, approval of the program, commitment to the accountability system, and participation in aspects

of support and action. The final goal is to accomplish the integration of risk management systems and strategies into the organization's culture of safety. No risk management program is able to function in isolation; its integration with other initiatives is critical to its success. By already established relationships, risk management professionals are able to enhance programs with limited sources by strengthening operational linkages. Negative perceptions about a risk management program might damage its credibility. Managers perceive that risk management's involvement after an event has occurred only makes matters worse, and is only motivated to minimize costs. Often, risk management programs are viewed as reactive to crisis rather than proactive. Risk management activities ought to concentrate on service and support, applying facilitative techniques to understand nonnegotiable forces: normal fines, citations, accreditations, requirements, and any available alternatives. Staff ought to have input into risk management processes, analysis, redesign, and controlling stages. Risk management requires the understanding of desired outcome. Guaranteeing that duplication of effort is minimized is a key selling point to staff members in order to accept their roles in the risk management effort. Risk management programs are not successful unless staff members at all levels understand their methods and purpose. In some cases, risk management professionals may provide unrelated services in order to gain trust and acceptance of the program.

Developing a risk management program is no simple task. Obtaining commitment to the program from all levels of the organization is necessary.

Conclusions

In this article, risk management process is explained. It concerns detail, analysis, and complexity. However, concerning the complexity of risk management, an effective risk management program adds a substantial advantage to any organization. The major benefit is that the cost of risk is reduced. Besides, the consequence of loss to society such as suffering and pain are reduced. Moreover, post-loss and pre-loss risk management objectives are more attainable. Finally, as the financial impact of loss is reduced, a company can decrease risk management programs.

This article describes how each variable of risk and organizational policy, as well as procedural determination contributes to an effective risk management program. The risk management professional in various organization must maintain sufficient respect and authority in practice, procedure and policies, as well as behavior which make it necessary to fulfill the objective of the risk management program. Risk management activities in organizations must have organizational performance objectives, policies, and guidelines to identify processes that maximize the accomplishment of program objectives. It is critical to keep an integrated approach of

development in order to accomplish a consistent purpose in the organization, as well as to avoid duplication of effort. The risk management professional ought to evaluate how best to enhance existing systems. All programs that generate controlling function, data collection, minutes, memos, and reports should be created as communication tools. To be most effective, tools are necessary to meet the needs of implementation, risk management change, and safety practices.

References

- Allen, Harris; Bunn, William. "How Risky Is Overtime, Really?" *Harvard Business Review*. May 2007, Vol. 85 Issue 5, p26-26, 1p.
- Apgar, David. *Risk Intelligence: Learning to Manage What We Don't Know*. Boston, Mass.: Harvard Business School Press, 2006.
- Berniker, Eli. "The Company Doctor: Risk, Responsibilities, and Corporate Professionalism" (Book). *Administrative Science Quarterly*, Jun2003, Vol.48 Issue 2, p311-314, 4p.
- Bothner, Matthew S; Jeong-han Kang; Stuart, Toby E. "Competitive Crowding and Risk Taking in a Tournament: Evidence from NASCAR Racing," *Administrative Science Quarterly*, Jun2007, Vol. 52 Issue 2, p208-247, 40p.
- Bremmer, Ian. "Managing Risk in an Unstable World." *Harvard Business Review*. Jun2005, Vol. 83 Issue 6, p51-60, 8p.
- Burgman, Marl A. *Risks and Decisions for Conservation and Environmental Management*. Cambridge, UK; New York: Cambridge University Press, 2005.

- Chance, Don M, Brooks, Robert. *An Introduction to Derivatives and Risk Management*. 7th ed., Australia: Thomson/South-Western, 2008.
- Chapman, Robert J. *Simple Tools and Techniques of Enterprise Risk Management*. Chichester, West Sussex, England; Hoboken, NJ: J. Wiley & Sons, 2006.
- Chavas, Jean-Paul. *Risk Analysis in Theory and Practice*. Amsterdam; Boston: Elsevier Butterworth-Heinimann, 2004.
- Condamin, Laurent; Louisot, Jean-Paul; Naim, Patrick. *Risk Quantification: Management, Diagnosis and Hedging*. Chichester, West Sussex, England; Hoboken, NJ : John Wiley, 2006.
- Cooper, Cary L. (Cary Lynn); Clarke, Sharon. *Managing the Risk of Workplace stress*, New York: Routledge, 2004.
- Dallas, George S. *Governance and Risk: an Analytical Handbook for Investors, Managers, directors, and stakeholders*, New York: McGraw-Hill, 2004.
- Drennan, Lynn T., McConnell, Allan. *Risk and Crisis Management in the Public Sector*. New York, NY: Routledge, 2007.
- Eccles, Robert G; Newquist, Scott C; Schatz, Roland. "REPUTATION and its Risk." *Harvard Business Review*, Feb2007, Vol. 85 Issue 2, p104-114, 11p.
- Herman, Melanie L., *Managing Risk in Nonprofit Organizations: A Comprehensive Guide*, Hoboken, N.J. : Wiley, 2004.
- Jorion, Philippe, 1955-, Global Association of Risk Professionals. *Financial risk manager handbook*. 4th ed., Hoboken, N.J.: Wiley & Sons, 2007.
- Koller, Glenn R. (Glenn Robert). *Assessment and Decision Making in Business and Industry: a Practical Guide*. 2nd ed., Boca Raton, FL: Chapman & Hall/CRC, 2005.
- La Porte, Todd R., "Shouldering Risks: The Culture of Control in the Nuclear Power Industry." *Administrative Science Quarterly*, Mar2006, Vol 51 Issue 1, p155-159, 5p.

- Loader, David. *Operations Risk : Managing a Key Component of Operations Risk Under Basel II*. 1st ed., Oxford: Burlington, MA : Butterworth-Heinemann, 2007.
- McCarthy, Mary Pat., Flynn, Timothy P., Brownstein, Rob. *Risk From the CEO and Board Perspective*. New York: McGraw-Hill, 2004.
- McDaniels, Timothy, Small, Mitchell J. *Risk Analysis and Society: an Interdisciplinary Characterization of the Field*, Cambridge; New York: Cambridge University Press, 2004.
- Morse, Gardiner. "Innovate at Your Own Risk." *Harvard Business Review*. May2005, Vol. 83 Issue 5, p25-25, 1p.
- Mun, Jonathan. *Applied Risk Analysis : Moving Beyond Uncertainty in Business*. Hoboken, N.J.: Wiley, c 2004.
- Nohria, Nitin; Stewart, Thomas A. "Risk, Uncertainty, and Doubt," *Harvard Business Review*, Feb2006, Vol. 84 Issue 2, p39-40, 2p.
- Ouchi, Fumika; Would, Bank. *A Literature Review on the Use of Expert Opinion in Probabilistic Risk Analysis*, Washington, D.C.: World Bank, 2004.
- Perrow, Charles. "Organizational Encounters with Risk," *Administrative Science Quarterly*, Sep2006, Vol. 51 Issue 3, p517-521, 5p.
- Rejda, George E. *Principles of Risk Management and Insurance*. 9th ed., Boston : Addison-Wesley, c2005.
- Reuvid, Jonathan. *Managing Business Risk*. 3rd ed., London ; Philadelphia : Kogan Page, 2006.
- Reuvid, Jonathan. Institute of Risk Management. *Managing Business Risk : a Practical Guide to Protecting your Business*., 4th ed., London ; Philadelphia : Kogan Page, 2007.

- Sine, Wesley D.; Haveman, Heather A.; Tolbert, Pamela S., "Risky Business? Entrepreneurship in the New Independent-Power Sector," *Administrative Science Quarterly*, Jun2005, Vol. 50 Issue 2, p200-232, 33p.
- Singpurwalla, Nozer D. *Reliability and Risk : a Bayesian Perspective*, New York : J. Wiley & Sons, 2006.
- Todinov, M.T. *Reliability and Risk Models: Setting Reliability Requirements*, Chichester , West Sussex ; Hoboken, NJ : Wiley, 2005.
- United Nations Development Programme. Bureau for Crisis Prevention and Recovery. *Reducing Disaster Risk : a Challenge for Development*. New York: United Nations Development Programme, Bureau for Crisis Prevention and Recovery, 2004.



AN ENQUIRY INTO “HOLLOWING OUT EFFECTS” IN HOME
EXPORTS, TECHNOLOGY INNOVATION, AND EMPLOYMENT: A
STUDY OF TAIWANESE ENTERPRISES TO CHINA

Ting Ling Lin
National Taipei University
tingling@mail.ntpu.edu.tw

Wen Chung Hsu
National Chi Nan University

Hsin Mei Lin
National Chi Nan University

Ching I Chen
National Chi Nan University

Abstract

In this study, we adopt multiple theoretical frameworks as a foundation to enquire the Hollowing Out effects in home exports, technology innovation, and employment from evidence of Taiwanese enterprises to China. The theoretical contributions of this study rest on the examination of the applicability of some existing theories rather than on the development of new theories. This research concludes that the effects of OFDI are not black and white but rather depend on the dimension of the focus of the home country's export, employment, and technology innovation.

Keywords: Hollowing Effects, Exports, Technology Innovation, Employment

Introduction

Foreign direct investment (FDI) in China is one of the most palpable outcomes of China's Open Door Policy, which was adopted in December 1978. Since 1993 China has become the second largest country hosting FDI in the world next to the United States. In the mean time, Taiwan has become one of the largest outward investors in mainland China. Furthermore, the value of Taiwanese transferring activities to mainland China has reached its new top (US\$4,59B) during 2003 (Investment commission, MOEA, 2009) . Therefore, many Taiwanese scholars have started to worry about the effect of Hollowing Out domestic industries which may happen after the large investment in mainland China. Hollowing Out effects refer to the undermining of manufacturing activities which are vital to health and growth of a national economy through FDI by multinational enterprises (MNEs) (Abe, Gunther & See, 1992).

Due to the enormous transfer of Taiwanese manufacturing activity to mainland, concluding previous studies (Abe et al., 1992, Matsubara, 2004, Nakamura & Shibuya, 1995) , Taiwanese outflow of manufacturing facilities to China could affect Taiwan's trade, technology innovation, and employment. Although the Hollowing Out issue has been debated in a variety of literature and studies, we can not say that there exists a broad consensus on what Hollowing Out means (Nakamura &

Shibuya, 1995). Accordingly, we can classify past arguments on Hollowing Out from a variety of viewpoints. Meanwhile, there are just few studies worked for Taiwan's secret worry of Hollowing Out manufacturing industry caused by transferring manufacturing activities to mainland. This paper employ the analyzing structure of Hollowing Out effects completed by (Nakamura and Shibuya, 1995, Abe et al., 1992) with minor modification for further discussion of Taiwan's phenomenon of Hollowing out. Moreover, all the statistic data used here were adapted from Taiwan area's economic statistics annual 2003 (TESA, 2003).

Literature Review

Definition of Hollowing Out Effect

The content of discussion on Hollowing Out can vary widely depending on what dimensions of the phenomenon is focused upon (Nakamura and Shibuya, 1995). According to recent literatures (Matsubara, 2004, Hsu, 2003, Chen and Ku, 2000, Tejima, 2000, Abe et al., 1992), we conclude Hollowing Out in this study as the undermining of manufacturing activities which are vital to health and growth of a national economy through FDI by multinational enterprises (MNEs)

The Omen of Hollowing Out

There are four main factors underlying the transferring production abroad (Chen and Ku, 2000, Tejima, 2000, Abe et al., 1992). First, the appreciation of a

country's currency raises the production cost of international immobile factors, such as wages, price of land (see also Dunning, 1993). Second, the trade frictions caused by a large trade surplus or other reasons destroy a relatively free export environment. Third, the firms become more mindful of a need to produce with a keener sense of economic rationality (Nakamura and Shibuya, 1995). Finally, a suitable location helps firms enjoy the application of the technology capability (Dunning, 1993).

The Mechanism of Hollowing out

Nakamura & Shibuya (1995) and Abe et al. (1992) concluded main studies of Hollowing effects caused by transferring production bases overseas in a similar result that the outflow of manufacturing facilities abroad affects a country on trade, technology innovation, and employment. The effects on each can be summarized as follows (see as figure 1) : (1) FDI may worsen the trade imbalance due to export substitution and increased imports; (2) FDI may lower domestic technological advances and accumulation by increasing R&D or innovation activities abroad; (3) FDI may lead to plant closures, declines in regional economies, and worsened domestic employment situation.

Review of the Literature and Discussion

The Effects on Employment

Talking about FDI's domestic employment effects mostly refers to the quantitative dimension of the phenomena. But there are also implications for the domestic qualification structure. For the industrialized countries it is proposed that low skill workers take a higher risk of being laid off when firms invest abroad (Freeman, 1997).

Dunning (1993) announced four major quantitative employment effects which are the following: Firstly, job displacement effect means the replacement of domestic export production and investment. Second, export stimulation effect indicates that foreign affiliates stimulate domestic export production. Third, home office employment denotes the increase of domestic management activities. The fourth effect is named 'supporting firm employment effect' which means the increase of domestic input production for MNEs (Knoedler, 2000). We would expect the displacement effect to have negative impact on domestic employment whereas export stimulation effect and home office employment effect support domestic employment. In addition, supporting firm employment effect supports domestic employment when MNE's domestic production increases by FDI.

Agarwal (1997) presented that the employment created by FDI and the need of management personnel are larger than the unemployment resulting from outward investment. Therefore, the net employment effect in home country is expected to be

positive. Tüselmann (1998) pointed out that the most German FDI outflow were driven by service sectors. Thus he concluded the various direct and indirect effects of German manufacturing FDI on domestic investments and jobs are positive rather than negative. Mariotti, Mutinelli† and Piscitello (2003) found a negative employment effects from the Italian case in the decade 1985-1995. Results suggested that the impact of outward FDI on labor intensity of domestic production is negative in the case of vertical investment undertaken- especially by smaller firms-in less developed countries, and positive for horizontal and market -seeking investments in advanced countries, identically with Agarwal (1997) .

The Effects on Trade

Yiu et al (2007) presented that outward FDI would have a more positive effect on home country exports if the subsidiaries are located in less developed countries, relatively new, and in a declining home industry than in developed countries, old, and a growing home industry, respectively. Blomström and Kokko (1994) found that the relation between foreign direct investments and home country exports seems to be complementary. They argued that foreign production substitutes for some home exports of finished goods, but the advantages of market proximity allow foreign affiliates to capture a larger market share than the parent can achieve, exporting from parent countries. The resulting increases in the home country's exports of

intermediate and related products are large enough to make up for the lost exports of finished goods. However, several studies have argued that exports are replaced by FDI once a critical level of market share is reached in a foreign market, or when it is threatened by tariff a non-tariff barriers or host country competitors. (Buckley and Casson, 1976).

The Effects on Technology Innovation

Foreign direct investment (FDI) can benefit innovation activity in the host country via spillover channels such as reverse engineering, skilled labor turnovers, demonstration effects, and supplier-customer relationships (Cheung and Lin, 2004) . On the other hand, if research and development (R&D) is done offshore and key technology are not retained at home, some Hollowing Out of technology innovation will ensue (Abe et al., 1992). Moreover, as the industrial structure becomes punctuated with holes, certain types of technology will become difficult to acquire at home, leading to a fear that the overall technological level of the country may fall (Nakamura and Shibuya, 1995) . However, Abe et al. (1992) pointed out that larger R&D expenditures can balance the negative effect of technology transferring overseas.

Empirical Study and Analysis of Taiwan's Case

The Omen of Hollowing Out in Taiwan

Taiwanese firms faced terrible conditions in the domestic investment environment since the late 1980s. Land prices increased sharply and the wage rate was raised up, while the Taiwan dollar appreciated (Hsu, 2003). Moreover, according to few indicators completed by Chen and Ku (2000), between 1986-1994, the share of manufacturing value-added in GDP decreased from 39.4 percent in 1986 to 29.0 percent in 1994, with manufacturing employment decreasing by 175,000 jobs about 7 percent of total employment in 1986. Between the periods, manufacturing wages rose by 120 percent in terms of the local currency, while the local currency appreciated by 26 percent against the US dollar. Many firms responded investing abroad. Reviewing previous discussion, Taiwan faced the omen of Hollowing Out its local manufacturing industry.

The Discussion of Taiwan's Case

Xie (1999) adapted the international balance of direct investment, the unemployment rate and the ratio of manufacturing to GDP as three key measures to be used to determine whether a Hollowing Out of industry has taken place. He then pointed out that Taiwan's balance of direct investment had been in red risk since 1993, the unemployment rate had risen, and the ratio of manufacturing output to GDP has also declined, concluding that the phenomenon of industrial Hollowing was event in Taiwan. On the other hand, Akabane pointed out that Taiwan's transfer of

operations overseas are mainly trade-oriented industries with a comparative disadvantage, and are most sunset industries. Furthermore, he noted that Taiwan's domestic industries have been upgraded with the steady development of service industries. So, he concluded that Taiwan's industry had not been hollowed out. However, since 1999, Taiwanese firms started to transfer hi-technology industry to mainland China and did foresee development toward Hollowing in and after 2000 (Kobayashi, 2003) . Hsu (2003) argued that Taiwan FDI ,especially those labor-intensive industries seeking cheap labor abroad, may cause a Hollowing Out of domestic industries and reduce domestic employment. In contrast, as the non-labor-intensive industry and expansionary FDI is beneficial to domestic industries.

Conclusion

There are a number of theories and approaches that attempt to examine the home country effects of outward foreign direct investment. However, there is an absence of an overarching theory which integrates and synthesizes the field. In this study, we adopt multiple theoretical frameworks as a foundation. Consequently, theoretical contributions of this study rest on the examination of the applicability of some existing theories rather than on the development of new theories.

The findings of the study suggest that overall OFDI has produced different impacts on different dimensions of the Taiwanese industry. These effects should vary

with not only directions (positive or negative) but also with magnitude. The findings thus have gone beyond previous studies which typically find such effects to be either positive (complementary) or negative (substitution). We conclude that the effects of OFDI are not black and white but rather depend on the dimension of the focus of the home country's industrial activities including export, employment, and technology innovation.

The Hollowing Out effects of Taiwanese transferring manufacturing activities to mainland China to Taiwan's domestic industries, as mentioned in previous literatures, were obviously found by the real statistics measures. However, from the view of Taiwan's previous structure of FDI, many literatures showed that Taiwan just stays in the process of industrial structure transferring and not all kind of FDI will hurt Taiwan's domestic industries. Thus, the Hollowing Out effect is not necessary to take place in future.

The study sheds light on the complexity of the home country effects of foreign direct investment and presents a clue as to the true diversity of issues that arise within the complex area of the relationship between OFDI and home country industrial activities. The findings of this study suggest that MNEs should, in addition, take into account the home-country effects of their overseas investment. On the one hand, if the investment has negligible or even negative effect on the home-country economy, the

firm that invests overseas will likely not get lasting support from the home-country government. On the other hand, negative effect on the home-country economy will eventually harm the home base operations of the firm in the long term.

Although our study shows the impact of OFDI on the different dimensions of the home economy, the analysis fails to reveal how the impact is actually realized. For instance, the similarity or complementarity of the production activities between subsidiaries and headquarter is overlooked. The inter-industry effect needs further investigation. In other words, the mechanism linking OFDI and its effects on the home industries has not been adequately explained. This research neglected the Hollowing effects caused by Taiwan's FDI to other countries. Moreover, the further research may discuss more about the economical effects cause by the sensitiveness of political issues between Taiwan and China.

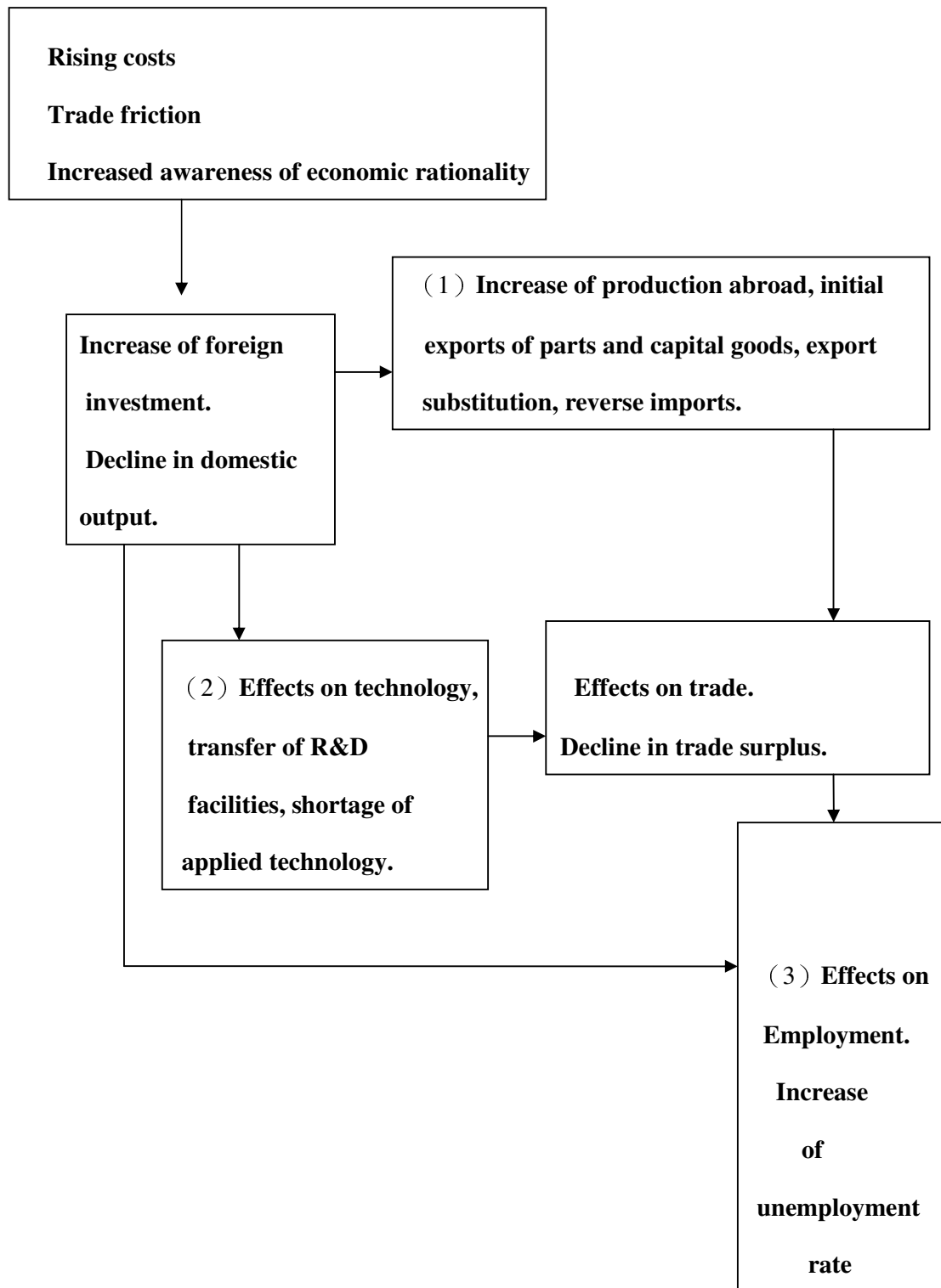
References

- Abe, K., Gunther, w., See, H., 1992, Economic industrial and managerial coordination between Japan and the USA, The Macmillan Press LTD, London. 26-113.
- Akabane, J., Direct investment and the Hollowing Out of industry in Taiwan, Journal of the Japan Association for Taiwan Studies, 4.
- Agarwal, J.P. (1997) Effect of foreign direct investment on employment in home countries, *Transnational Corporations*, 6 (2): 1-27.

- Blomstrom, M., Fors, G. Lipsey, R., 1997. Foreign direct investment and employment: home country experience in the United States and Sweden. *Economics Journal* 107, 1787-1797.
- Blomstrom, M., Kokko, A., 1994, Home country effects on foreign direct investment: evidence from Sweden, Working Paper 4639, National Bureau of Economic Research, Cambridge.
- Buckley, P.J. and Casson, M. (1976) *The future of multinational enterprise*. London: Macmillan.
- Buckley, P., Ghauri, P., N., 1999, *The internationalization of the firm: a reader*, Tomson Learning, Oxford, UK.
- Chen, T.J., Ku, Y.H., 2000. The effect of foreign direct investment on firm growth: the cause of Taiwan's manufacturers, *Japan and the World Economy*, 12, 153-172.
- Cheung, K.Y., Lin, P., 2004. Spillover effects of FDI on innovation in China: evidence from the provincial data, *China Economic Review*, 15, 25-44.
- Department of Statistics, Ministry of Economic Affairs, 2004, *Economic statics annual*, the Republic of China (Taiwan area) 2003, Taipei, Taiwan.
- Dunning, J. H., 1993, *Multinational enterprises and the global economy*, Addison-Wesley Publishing Co.
- Freeman, R.B. (1997) Does globalization threaten low-skill Western workers? In: Philpott, J. (Ed.), *Working for full employment*: 132-150, London: Routledge.
- Hsu, C.M., 2003, *The role of Taiwanese foreign direct investment in China: economic integration or Hollowing-out*, Shadow Financial Regulatory Committee, Taipei, Taiwan.
- Investment Commission, MOEA (2009) · Monthly report OF foreign investment, OFDI, and investment in China.

- Knoedler, H. (2000) Domestic employment effects of foreign direct investment: empirical evidence for West-Germany 1986 to 1996, *Management Research News*, 23 (2-4): 44-46.
- Kobayashi, H., 2003, Responses of south Korea, Taiwan and Japan to the Hollowing Out of industry, Center of Excellence Contemporary Asian Studies, Working Paper, 6.
- Kotabe, M., 1989, Hollowing- Out of U.S. multinationals and their global competitiveness: an intrafirm perspective, *Journal of Business Research*, 19, 1-15.
- Lim, S., 2002, Dynamic comparative advantage and primary product export opportunities, *Primary Industry Management*, 5 (3), 19-22.
- Matsubara, K., 2004, FDI and reverse imports and Hollowing out, Hitotsubashi University, Japan.
- Mariotti, S., Mutinellit, M., Piscitello, L., 2003, Home country employment and foreign direct investment: evidence from the Italian case, *Cambridge Journal of Economics*, 27, 419-431.
- Nakamura, Y., Shibuya, M., 1995, The Hollowing Out phenomenon in the Japanese industry, *Studies in International Trade and Industry*, 19.
- Tejima, S., 2000 Japanese FDI, the implications of Hollowing Out on the technological development of host countries, *International Business Review*, 9, 555-570.
- Tuselmann, H., J., 1998, Standort Deutschland: German direct foreign investment – exodus of German industry and export of jobs, *Journal of World Business*, 33 (3), 295-313.
- Walz, U., 1997, Innovation, foreign direct investment and growth, *Economica*, 64, 63-79.
- Xie, K., Y., 1999, Overseas shift of Taiwanese firms and verification of the Hollowing Out of industry, The Bank of Taiwan.
- Yiu, Daphne, Lau, W., Bruton, G.D., 2007, International venturing by emerging economy firms: the effects of firm capabilities, home country networks, and corporate entrepreneurship, *Journal of International Business Studies*, 38 (4): 519-540.

Figure 1: Mechanism of Hollowing out



THE STUDY OF THE RELATIONSHIPS AMONG EXPERIENTIAL
MARKETING, SERVICE QUALITY, CUSTOMER SATISFACTION
AND CUSTOMER LOYALTY

Ming-Shing Lee

Department of Innovation and Entrepreneurship
Far East University, Taiwan, R.O.C.
mingshing@cc.feu.edu.tw

Huey-Der Hsiao

Department of Business Administration
Far East University, Taiwan, R.O.C.
hsiao322@cc.feu.edu.tw

Ming-Fen Yang

Department of Leisure and Sports Management
Far East University, Taiwan, R.O.C.
arthur@cc.feu.edu.tw

Abstract

There have been numerous local and foreign scholars conducting survey researches on various trades in view of the relationship among service quality, customer satisfaction and customer loyalty. However, there are few researchers viewing experiential marketing as the experimental subjects in shopping mall researches. This research aims to explore the relationship among experiential marketing, service quality, customer satisfaction and customer loyalty for various shopping malls located on Tainan. The sample matrices in this research are the subjects of

shopping malls like Careerfour, RT-mart, Geant and others located on Tainan. There are totally 4 types of customers operated with the analyzing tools like convenient sampling, demographic variables, factor analysis, reliability analysis, T-tests, multiple regression analysis. There are totally 600 questionnaires delivered with 496 valid and 104 invalid replies received. Valid replies are rated at 82.67% .

Experimental results show:

1. Experiential marketing has a significantly positive effect on customer satisfaction.
2. Service quality has a significantly positive effect on customer satisfaction (partially supported).
3. Customer satisfaction has a significantly positive effect on customer loyalty.
4. Experiential marketing has a significantly positive effect on customer loyalty.
5. Service quality has a significantly positive effect on customer loyalty.

Keywords: Experiential Marketing, Service Quality, Customer Satisfaction, Customer Loyalty

Introduction

Research Background and Motivations

The idea of experiential marketing is an important trend for the economic era of human body experimental subjects. It means a marketing idea featured with both rationality and sensibility. Therefore, the decision of shopping activities made by consumers will be influenced by sensory factors to a certainly degree. Recently, experiential marketing has become a prevalent trend. Also, it seems this prevalence also influence discount shopping malls. Aside from enhancing comfortable space and well-organized shopping routes, discount shopping malls also

integrate the effort from various types of vendors to hold several promotion campaigns and enhance the circulation of advertising information. Such effort aims to create the environment for both recreation and shopping quite different from past settings. With various types of promotion campaigns, effort is made to increase operation performance. With the rapid development of discount shopping mall industries in Taiwan, discount shopping malls have deeply influenced the shopping habits of local consumers. In view of catering to the demands of consumers for lower prices and better service, operators of discount shopping malls have adopted various measures to satisfy consumers' demands with the highest profit reached. Under such a background, the key factor to influence customer satisfaction and customer loyalty means the service quality of discount shopping malls and this is also one of research motives. In addition, the evaluation and perception of consumers arisen from experiential marketing is also an important factor to influence customer satisfaction and customer loyalty. This point is worthy of exploration and it means the second motive for this research.

Research Objectives

Aside from allowing consumers with more knowledge about products, experiential marketing is functioned with higher capability to maintain original brand value after practical quality comparison made by consumers. Also, the purchase willing of consumers can be

intensified and better sales performance can be reached. In the perspective of discount shopping malls, service quality is a major niche. Meanwhile, service quality is also an important key point to show the difference from peers in the same trade. In view of how to win out from violent market competition, the only way is to provide consumers with excellent service and quality to satisfy their demands and expectations. As such, customer satisfaction and customer loyalty can be intensified. Therefore, if discount shopping malls want to keep old consumers and attract new consumers, it is naturally required to keep customer relationship management excellently, because loyal consumers mean the most valuable of a company. Loyal consumers cannot only create profit, but also conduct free advertising activities.

The research objectives are:

1. It aims to explore the influential degrees on experiential marketing, service quality, customer satisfaction and customer loyalty.
2. It aims to find out effective measures and strategies for discount shopping malls to enhance customer satisfaction.
3. The aforesaid results can give important reference available for discount shopping malls to enhance customer satisfaction.

Literature Review

Experiential Marketing

“Experiential Marketing” means unforgettable memory or experience rooted deeply in people’s mind. It can be from the definition of experience, in modern consumption environment, consumers emphasize their own experience during consumption process. It can allow consumers with sentimental and impressive emotion to intensify consumers’ purchase desire and increase additive value of products.

Experiential marketing aims to request marketing staffs to emphasize the overall experience quality for consumers passed by brands, including rational decision-making and sentimental consumption experience. Kotler (2003) also indicated there have been more and more companies starting to develop non-rational image request and ask for the aids from anthropologists and psychologists to develop messages to make deep soul touched. It is noteworthy experiential marketing never ignores the quality of rationality and claim of functions. It is based on quality to intensify sentimental and functional claims.

Schmitt (1999) used to propose 5 strategic experience modules composed of consumers’ 5 various experience types, namely sensation experience, emotion experience, thinking experience, action experience and association experience.

Service Quality

Parasuraman et al. (1988) contended service means the difference degrees of service arisen from the process of service delivery and the interaction between service providers and

consumers. Additionally, quality evaluation does not only cover the evaluation of service results, but also the evaluation of service delivery process with a emphasis consumers, not business managers, define service quality.

Parasuraman et al. (1988) further conduct experimental exploration with 10 dimensions debriefed as 5 dimensions in an increasing important order, reliability, response, certainty, empathy and tangibility. They are based on the difference between comparative expectation and perceptual service to measure service quality categorized as negative or positive values. The said 5 dimensions are detailed as below:

(1) Reliability : It means the capability to perform the already promised service reliably and correctly.

(2) Responsiveness : It means the willing to help consumers and immediate service delivery.

(3) Assurance : It means the knowledge and politeness of employees and their capability to deliver trust and confidence.

(4) Empathy : It means the capability to show empathy on consumers' personalizing.

(5) Tangibles : It means physical equipment of service, employees' manners, tools and equipment provided for service, namely locales, equipment and personnel for service delivery.

Customer Satisfaction

Customer satisfaction mainly derives from the physiological response with the perceptual difference gap between expectation before consumption and practical experience after consumption of service or products. It means accumulated temporary and sensory response. Therefore, under such a specific consumption setting, it frequently influences the overall attitude and decision-making when customers purchase products or service. In numerous researches about purchase behaviors conducted by customers, there are scholars broadly use the expectation-confirmation theory and the rational expectation theory to explore the expectation before purchase and satisfaction after purchase among consumers (Kotler and Keller, 2006).

Anderson and Srinivasan (2003) conduct the measurement with consumer satisfaction categorized into 5 dimensions, (1) overall satisfaction, (2) customer favorite, (3) customer loyalty, (4) customer recommendation and (5) priority option. Understanding customer satisfaction will facilitate companies to maintain customer satisfaction to products or service. As such, inferior products or service can be improved to allow customers with wonderful impression.

Moreover, according to the measurement dimensions for customer satisfaction proposed by the Commerce Office of Economic Ministry (2004), the dimensions cover discount shopping mall environment (such as the comfort of shopping environment and atmosphere, the convenience for motorbike and vehicle parking), personal service (such as kind attitude, rapid

check-out operation), discount shopping mall service (such as recreation space, delicate product packing), tangible products (such as legible price tags, promotion goods consistent with advertising information) and value (such as quality against prices, reasonable quality and prices). To sum up above mention, there are different dimensions and opinions to measure customer satisfaction in both local and international scientific lectures.

Customer Loyalty

Piotr (2004) indicated loyal customers shows 3 characteristics as below. (1) They spend more money in purchasing products or service of a company. (2) They encourage others to purchase products or service of a company. (3) They believe it is valuable to purchase products or service of a company. Namely, consumers show a behavioral intention willing to continue the relationship with a certain brand or a company. Actually, in the field of marketing science, customer loyalty is vested with highly mature conceptions. With past effort made by several scholars, we have known much about the definition of customer satisfaction.

Chaudhuri and Holbrook (2001) revealed customer loyalty is established by attitude loyalty and behavior loyalty. Attitude loyalty means the loyalty in attitude and the tolerance to price. Behavior loyalty means continuous purchase and recommendation behaviors. Gronholdt et al. (2000) indicated customer loyalty is composed of 4 indicators including customers' re-purchase intention, tolerance to prices, the willing to recommend a brand or a company and the

willing to conduct cross purchase. Also, the said 4 items can act as the measurement indicators for customer loyalty.

To summarize above mention, it can be seen if people are going to measure customer loyalty, the measurement can be conducted and considered roughly in 5 levels, (1) re-purchase willing, (2) derivatively positive oral administration, (3) recommendation willing, (4) tolerance to price adjustment, and (5) consumption frequency.

Relationships Between Research Variables

The Relationship between Experiential Marketing and Customer Satisfaction

Petrick, Morais, and Norman (2001) explained that companies can change the experience when consumers are using products or service to make them reach the highest satisfaction. Liao (2004) conducted the research on influence results caused by consumption experience factors of professional baseball fans onto satisfaction and loyalty, results indicated the consumption experience of professional baseball fans cause directly positive influence.

The aforesaid researchers contended consumption experience should be the antecedent of satisfaction. Also, there is a significant relationship existing between consumption experience and satisfaction. However, the significant relationship between satisfaction and various experience dimensions varies with different experimental subjects. To summarize above mention, the hypotheses for this research are proposed as below:

Hypothesis 1 : Experiential Marketing Has A Significantly Positive Effect On Customer Satisfaction.

The Relationship Between Service Quality and Customer Satisfaction

Zeithaml and Bitner (2000) indicated, although service quality and perceptual customer satisfaction can be respectively held as independent levels for service touch experience, yet they can be also held as an overall level.

Bedi (2010) proposed that delivery of high service quality is a must for attaining customer satisfaction and a number of other desirable behavioral outcomes.

For customers, service quality and customer satisfaction derive from organized service. No matter in the performance of service givers or quality of products, they also show overall organized image. To consumption customers, they are equally important and cause influence on satisfaction as well (Peter, Danuta, and Ellen, 1999). To summarize above mention, the research hypotheses are proposed as below:

Hypothesis 2 : Service Quality Has A Significantly Positive Effect On Customer Satisfaction.

The Relationship Between Customer Satisfaction and Loyalty

Shankar, Smith, and Rangaswamy (2003) conducted their research with tourism service industries as the experimental subjects to explore the relationship between customer satisfaction

and customer loyalty through on-line transaction. Research results showed customer satisfaction causes positive relationship with customer loyalty.

Kim, Lee, and Yoo (2006) proposed that satisfied customers exhibit loyalty and provide positive word-of-mouth. Thus, customer satisfaction is the antecedent of customer loyalty and cause positive influence on loyalty (Zeithaml and Bitner, 1996; Hu, Kandampully, and Juwaheer, 2009). It is known from aforesaid scientific lectures customer satisfaction causes significantly positive relationship with customer loyalty. The research hypotheses are proposed as below:

Hypothesis 3 : Customer Satisfaction Has A Significantly Positive Effect On Customer Loyalty.

The Relationship Between Experiential Marketing and Customer Loyalty

In the research conducted by Lin, Lin and Lee (2007) , taking four famous coffee chain stores in Taipei for example, the research aimed to explore the relationships among experiential marketing, customer satisfaction and customer loyalty, research results showed (1) feel experience and relation experience have significantly positive influence on customer satisfaction; (2) Customer satisfaction has a significantly positive influence on customer loyalty; (3) The relation experience has a greatest influence to customer satisfaction. Huang, Huang and Su (2007) conducted their research is targeted at the visitors of Non-Smoking Paradise Special Exhibition at National Science and Technology Museum to explore the relationships among

experiential marketing, service quality, satisfactions and loyalty, research results showed :(1) Experiential marketing and service quality have significantly positive influence on visitor's satisfaction. (2) Visitor's satisfaction has a significantly positive influence on visitor's loyalty. (3) Sense experience of experiential marketing has the most influence on the satisfaction of special exhibition. (4) Action experience of experiential marketing affects National Science and Technology Museum the most. (5) The tangible service quality has the most influence on the satisfaction of special exhibition. (6) The guarantee of service quality affects most on the satisfaction of special exhibition.

All the aforesaid scholars affirm significantly positive correlation exists between experiential marketing and loyalty. To summarize above mention, the research hypotheses are proposed as below:

Hypothesis 4 : Experiential Marketing Has A Significantly Positive Effect On Customer Loyalty.

The Relationship Between Service Quality and Customer Loyalty

Hu, Lu, and Huang (2010) conducts an experiment with the subject of Air cargo terminals. From the research, it indicates that customer satisfaction significantly influences loyalty, and service quality, innovation capability, and corporate image are positively correlated with customer satisfaction. From aforesaid researches, it is found service quality can also

influence loyalty through customer satisfaction and customer loyalty (Shen and Hsieh, 2003).

Therefore, there is causation existing between satisfaction and loyalty wherein the influence degrees vary with different experimental subjects. Based on the above literatures, the hypotheses for this research are proposed as below:

Hypothesis 5 : Service Quality Has A Significantly Positive Effect On Customer Loyalty.

Research Design and Methodology

Research Framework and Hypotheses

This research adopts the experimental subjects from the discount shopping malls located in Tainan by the measurement of experiential marketing, service quality, customer satisfaction and customer loyalty to explore the relationship among experiential marketing, service quality, customer satisfaction and customer loyalty. By reviewing aforesaid research goals and scientific lectures, research structures are proposed as Figure 1.

The hypotheses in this research:

Hypothesis 1 : Experiential Marketing Has A Significantly Positive Effect On Customer Satisfaction.

Hypothesis 2 : Service Quality Has A Significantly Positive Effect On Customer Satisfaction.

Hypothesis 3 : Customer Satisfaction Has A Significantly Positive Effect On Customer Loyalty.

Hypothesis 4 : Experiential Marketing Has A Significantly Positive Effect On Customer Loyalty.

Hypothesis 5 : Service Quality Has A Significantly Positive Effect On Customer Loyalty.

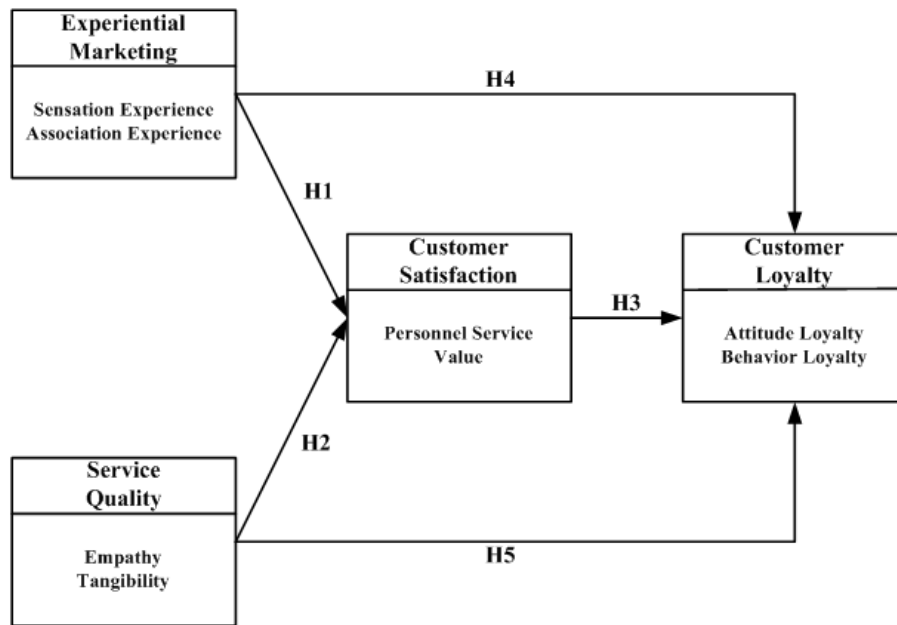


Figure 1. Research Framework

Experimental Analysis

Characteristics of Respondents

The experimental subjects of research questionnaires focus on the consumers of Carrefour, RT-Mart, Geant and other discount shopping malls located on Tainan, totally 4 types of consumers. Questionnaire survey was started from mid-May, 2009. There were totally 600 questionnaires delivered with 600 replies received. By deducing 104 invalid replies, there were

496 valid replies received with valid replies rated at 82.67% . In view of valid samples for this research, the number of Carrefour customers is 328 with the highest proportion of 66.1%.

In 496 valid replies, males occupy 48.4% and females amount to 51.6%. In view of age distribution, most samples are those aging 21~30, routine 57.5% totally, followed by those aging below 19 (15.3%) and 31~40 (13.7%). Oppositely, samples aging above 61 occupy the lowest proportion rated at 1.4%. In view of academic background, samples with bachelor's degrees occupy the largest proportion rated at 69.4% totally. In view of occupation distribution, most samples are students rated at 53.4%, followed by people from service industries rated at 16.1%. In view of monthly income, the monthly income of most samples is below NTD 10000 rated at 52% and such a result is because students occupy 53.4% of total samples. The average monthly income of other samples ranges from NTD 10001 to 25000 rated at 27.2% totally. In view of purchase frequency, most samples go shopping less than once rated at 43.5%. In view of consumption amount, the consumption amount of most samples is below NTD 1000 rated at 48% totally.

The Factor Analysis and Reliability Analysis of Various Dimensions

To concentrate the effect of variables in research dimensions, every research variables are operated with factor analysis. This research is operated with principal component analysis to exclude factors with eigenvalues above 1. Thereafter, the varimax rotation method is operated

with fact above 0.6 after rotation and other components of factor loadings with difference above 0.3 extracted. About the principles for reliability examination, standards are Cronbach's Alpha values above 0.7 and item- to-total correlation coefficients above 0.6 held as acceptable.

Experiential Marketing

In the dimension of experiential marketing, there are 23 questions in the questionnaire originally. However, after factor analysis, there are 11 questions deleted due to incongruity to standards for factor evacuation. There are 2 major factors screened namely “sensation experience” and “association experience”. The percentage of cumulative explained variance is rated at 65.493%. The Cronbach's Alpha value in the sensation dimension is 0.899. The Cronbach's Alpha value in the association dimension is 0.885 with all coefficients of item-to-total correlation above 0.6.

Service Quality

For factors in the dimension of service quality, because they are incongruent with factor evaluation standards, there are toad 8 questions deleted with 2 major factors extracted, namely “Empathy” and “Tangibility”. The percentage of cumulative explained variance is 68.552%. The Cronbach's Alpha value in the dimension of empathy is 0.951. The Cronbach's Alpha value in the dimension of tangibility is 0.868 with all coefficients of item-to-total correlation above 0.6.

Customer Satisfaction

In the dimension of customer satisfaction, there are 11 questions originally. After factor analysis, there are 2 questions incongruent with evaluation standards and they are deleted finally. In addition, there are 2 major factors extracted, namely “personnel service” and “value”. The percentage of cumulative explained variance is 74.123%. The Cronbach's Alpha value in the dimension of personnel service is 0.922. The Cronbach's Alpha value in the dimension of value is 0.858 with all coefficients of item-to-total correlation above 0.6.

Customer Loyalty

In the dimension of customer loyalty, there are 9 questions in the questionnaire originally. After factor analysis, there is a question incongruent with factor evaluation standards deleted finally and there are 2 major factors extracted, namely “attitude loyalty” and “behavior loyalty”. The percentage of cumulative explained variance is 70.464%. The Cronbach's Alpha value in the dimension of loyalty is 0.897. The Cronbach's Alpha value in the dimension of loyalty is 0.778 with all coefficients of item-to-total correlation above 0.6.

Multiple Regression Analysis

The Effects of Experiential Marketing on Customer Satisfaction

This paragraph aims to explore the situation with 2 factors (sensation experience and association experience) of the experiential marketing dimension held as independent variables and 2 factors (personnel service and value) of the customer satisfaction dimension held as

dependent variables. The exploration is operated with multiple regression analysis. It aims to understand the influence on customer satisfaction caused by experiential marketing among discount shopping malls located on Tainan. As Table 1 shown, all regression modes are significant. Therefore, Hypothesis 1 is supported.

Table 1. Effects of Experiential Marketing on Customer Satisfaction

Dependent Variable	Independent Variable	Standardized β Value	VIF	F Value	R ² Value
Personnel Service	Sensation Experience	0.125**	1.401	142.932	0.367
	Association Experience	0.529***	1.401		
Value	Sensation Experience	0.145**	1.401	83.323	0.253
	Association Experience	0.410***	1.401		

*p<0.05, **p<0.01, ***表示p<0.001

The Effects of Service Quality on Customer Satisfaction

This paragraph aims to explore the situation with 2 factors (empathy and tangibility) of the service quality dimension held as independent variables and 2 factors (personnel service and value) of the customer satisfaction dimension held as dependent variables. The exploration is operated with multiple regression analysis. It aims to understand the influence on customer satisfaction caused by the service quality dimension among discount shopping malls located on Tainan. As Table 2 shown, all regression modes are significant except no significant influence on

personnel service satisfaction caused by empathy of the service quality dimension. Therefore, Hypothesis 2 offers partial support.

Table 2. Effects of Service Quality on Customer Satisfaction

Dependent Variable	Independent Variable	Standardized β Value	VIF	F Value	R ² Value
Personnel Service	Empathy	0.073	1.724	298.669	0.548
	Tangibility	0.691***	1.724		
Value	Empathy	0.096*	1.724	159.52	0.392
	Tangibility	0.560***	1.724		

*p<0.05, **p<0.01, ***p<0.001

The Effects of Customer Satisfaction on Customer Loyalty

This paragraph aims to explore the situation with 2 factors (personnel service and value) of the customer satisfaction dimension held as independent variables and 2 factors (attitude loyalty and behavior loyalty) of the customer loyalty dimension held as dependent variables. The exploration is operated with multiple regression analysis. It aims to understand the influence on customer satisfaction caused by the customer loyalty dimension among discount shopping malls located on Tainan. As Table 3 shown, all regression modes are significant. Therefore, Hypothesis 3 is supported.

Table 3. Effects of Customer Satisfaction on Customer Loyalty

Dependent Variable	Independent Variable	Standardized β Value	VIF	F Value	R ² Value
Attitude Loyalty	Personnel Service	0.761***	2.032	301.424	0.658
	Value	0.271***	2.032		
Behavior Loyalty	Personnel Service	0.393***	2.032	105.127	0.299
	Value	0.193***	2.032		

*p<0.05,**p<0.01,***p<0.001

The Effects of Experiential Marketing on Customer Loyalty

This paragraph aims to explore the situation with 2 factors (sensation experience and association experience) of the experiential marketing dimension held as independent variables and 2 factors (attitude loyalty and behavior loyalty) of the customer loyalty dimension held as dependent variables. The exploration is operated with multiple regression analysis. It aims to understand the influence on customer satisfaction caused by the experiential marketing dimension among discount shopping malls located on Tainan. As Table 4 shown, all regression modes are significant. Therefore, Hypothesis 4 is supported.

Table 4. Effects of Experiential Marketing on Customer Loyalty

Dependent Variable	Independent Variable	Standardized β Value	VIF	F Value	R ² Value
Attitude Loyalty	Sensation Experience	0.147**	1.401	133.87	0.352
	Association Experience	0.501***	1.401		
Behavior Loyalty	Sensation Experience	0.156**	1.401	52.281	0.175
	Association Experience	0.481***	1.401		

*p<0.05, **p<0.01,***p<0.001

The Effects of Service Quality on Customer Loyalty

This paragraph aims to explore the situation with 2 factors (tangibility and empathy) of the service quality dimension held as independent variables and 2 factors (attitude loyalty and behavior loyalty) of the customer loyalty dimension held as dependent variables. The exploration is operated with multiple regression analysis. It aims to understand the influence on customer satisfaction caused by the experiential marketing dimension among discount shopping malls located on Tainan. As Table 5 shown, all regression modes are significant. Therefore, Hypothesis 5 is supported.

Table 5. Effects of Service Quality on Customer Loyalty

Dependent Variable	Independent Variable	Standardized β Value	VIF	F Value	R ² Value
Attitude Loyalty	Empathy	0.089*	1.724	281.153	0.533
	Tangibility	0.669***	1.724		
Behavior Loyalty	Empathy	0.181***	1.724	80.352	0.246
	Tangibility	0.594***	1.724		

*p<0.05, **p<0.01, ***p<0.001

Conclusions and Suggestions

Research Conclusions

The Influence of Experiential Marketing on Customer Satisfaction

According to results in this research, the experiential marketing of discount shopping malls causes significantly positive influence on customer satisfaction. As research results show,

“association experience” and “sensation experience” in the dimension of experiential marketing both cause more influence on “personnel service” and “value” in the dimension of customer satisfaction.

The Influence of Service Quality on Customer Satisfaction

“Empathy” in the dimension of service quality causes little positive influence on “value” in the dimension of customer satisfaction. “Empathy” in the dimension of service quality causes no positive influence on “personnel service” in the dimension of customer satisfaction. As research results show, service quality of discount shopping malls causes significantly positive influence on customer satisfaction partially. As research results show, “tangibility” in the dimension of service quality causes more influence on “personnel service” and “value” in the dimension of service quality.

The Influence of Customer Satisfaction on Customer Loyalty

As research results show, customer satisfaction of discount shopping malls causes significantly positive influence on customer loyalty. Namely, higher customer satisfaction of discount shopping malls naturally causes higher customer loyalty as discount shopping malls predict previously. As research results show, “personnel service” in the dimension of customer satisfaction causes more influence on “attitude loyalty” in the dimension of customer loyalty.

The Influence of Experiential Marketing on Customer Loyalty

As research results show, experiential marketing of discount shopping malls causes positive influence on customer loyalty. Research results reveal “association experience” in the dimension of experiential marketing causes more influence on “attitude loyalty” and “behavior loyalty” in the dimension of customer loyalty.

The Influence of Service Quality on Customer Loyalty

As research results show, service quality of discount shopping malls causes significantly positive influence on customer loyalty. Research results reveal “tangibility” in the dimension of service quality causes more influence on “attitude loyalty” and “behavior loyalty” in the dimension of customer loyalty.

Future Research Directions

There are numerous factors to affect customer loyalty and customer satisfaction of discount shopping malls. There are only 2 dimensions of experiential marketing and service quality integrated into this research. Future research can integrate some other dimensions like company image, relationship marketing and consumer life styles. Aforesaid items are those worthy of further exploration. This research is mainly operated with survey questionnaire experimentally. If deeper interview with company employees is available, research results can show more actual facts.

Managerial Suggestions

1. Customers' emphasis on service attributes vary with time passing. Therefore, management rankers of discount shopping malls shall conduct factor analysis and multiple regression analysis on aforesaid factors periodically with proper follow-up adjustment available for the changes to customer preferences.
2. Various dimensions of experiential marketing adopted by this research are based on relevant scientific lectures. It is expected to seek the most proper dimension of experiential marketing with enhanced explanation capability of experiential marketing available for satisfaction. Experiential marketing shall be implemented with the effort accompanied by other strategic marketing combinations and tactic activities to exert additive or synergistic effect. For product features and functions of experiential marketing, if there is no particular difference within commodities of the same categories, price levels of commodities cause significant influence on re-purchase willing of customers. Naturally, the effect of experiential marketing for the said categories of commodities is affected. Therefore, the ways of marketing strategies how to select commodities, quote prices, conduct promotion and build outlets are very important.
3. Business operators shall aggressively come up with the ways how to increase consumer benefit and additive profit for products to stimulate customers' consumption motives and demands to commodities, but never focus on promotional price competition only.

References

- Anderson, R. E., and Srinivasan, S. S. (2003). E-Satisfaction and E-Loyalty: A Contingency Framework. *Psychology and Marketing*, 20(2), 122–138.
- Bedi, Monica.(2010). An Integrated Framework for Service Quality, Customer Satisfaction and Behavioral Responses in Indian Banking Industry-a Comparison of Public and Private. *Journal of Services Research*, 10(1), 157-172.
- Chaudhuri, A., and Holbrook, M. B. (2001). The Chain of Effects from Brand Trust and Brand Affect to Brand Performance: The Role of Brand Loyalty. *Journal of Marketing*, 65(2), 81-93.
- Gronholdt, L., Martensen, A., and Kristensen, K. (2000). The relationship between Customer Satisfaction and Loyalty: Cross-Industry differences. *Total Quality Management* , 11(4-6), 509-514.
- Hu, K. C., Lu, M. Y., and Huang, M. C. (2010). The Effects of Service Quality, Innovation Capability, and Corporate Image of Air Cargo Terminals on Customer Satisfaction and Loyalty. *International Journal of Commerce and Strategy*, 2(1), 37-54.
- Hu, H. H., Kandampullyb, J., and Juwaheer, T. D.(2009). Relationships and impacts of service quality, perceived value, customer satisfaction, and image: an empirical study. *The Service Industries Journal*, 29(2), 111-125.
- Huang, C. Y., Huang, Y. C., and Su, F. Y. (2007). A Study of the Relationship among the Experiential Marketing, Service Quality, Satisfactions and Loyalty of the Museum Visitors for The Non Smoking Paradise Special Exhibition. *Technology Museum Review*, 11(4), 71-91.

- Kim, W.G., Lee, Y.K., & Yoo, Y.J. (2006). Predictors of relationship quality and relationship outcomes in luxury restaurants. *Journal of Hospitality & Tourism Research*, 30(2), 143–169.
- Kotler, P. (2003). *Marketing management* (7th ed.). New Jersey: Prentice Hall.
- Kotler, P , Keller, KL, (2006), *Marketing Management*(12th ed.). Pearson Prentice Hall.
- Liao, J. R. (2004). *A Study of the Effect of the Professional Baseball Game Spectators Consumption Experience Element toward Experience Satisfaction and Loyalty Intention*. the Dissertation of Doctor's Degree, Department of Physical Education, NTNU.
- Lin, Y. C., Lin, H. C., and Lee, Y. C. (2007). The Study of the Relationship among Experiential Marketing, Customer Satisfaction and Customer Loyalty. *Journal of Customer Satisfaction*, 3(2), 57-94.
- Parasuraman, A., Zeithaml, V. A., and Berry, L. L. (1988). SERVQUAL: A Multiple-item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Marketing*, 64(1), 12-40.
- Peter, H., Danuta, A. N., and Ellen, A. (1999). Service quality and customer satisfaction: An assessment and future direction. *Journal of Academic Librarianship*, 25(1), 9-17.
- Petrick, J. F., Morais, D. D., and Norman, W. C. (2001). An examination of the determinants of entertainment vacationer's intentions to revisit. *Journal of Travel Research*, 40(1), 41-48.
- Piotr, Z. (2004). Technical Analysis as the Representation of Typical Cognitive Biases. *International Review of Financial Analysis*, 13(2), 217-225.
- Schmitt, B. H. (1999). Experiential Marketing. *Journal of Marketing Management*, 15(1), 53-67.
- Shankar, V., Smith, A. K., and Rangaswamy, A. (2003). Customer Satisfaction and Loyalty in Online and Offline Environments. *International Journal of Research in Marketing*, 20(2), 153-175.

Shen, C. C., and Hsieh, C. Y. (2003). A Study on the Relationship among Attraction, Tourist Satisfaction and Loyalty of Religious Tourism – A case of Fo Guang Shan in Kaohsiung. *Tourism Management Research*, 3(1), 79-95.

The Commerce Office of Economic Ministry (2004). *Customer Satisfaction Survey by Trade*. The Ministry of Economic, Taipei.

Zeithaml, V. A., and Bitner, M. J. (1996). *Service marketing*. New York: McGraw-Hill.

Zeithaml, V. A., and Bitner, M. J. (2000). *Service Marketing: Integrating Customer Focus Across the Firm*. New York: McGraw-Hill.

THE INTERNATIONALIZATION OF HUMAN RESOURCE MANAGEMENT IN THE HOST NATION CONTEXT & STRATEGIC APPROACH OF IHRM

Dr. Pranee Chitakornkijsil
Graduate School of Business Administration
National Institute of Development Administration (NIDA), Thailand.
wayne.s@nida.ac.th

Abstract

In this study, the internationalization of human resource management is considered. It concerns staffing, expatriate procurement, compensation, training and development, international labor relations, as well as performance evaluations and contributions. Likewise, international human resource management (IHRM) in the host nation context is presented. Later, controlling IHRM practices of host nation subcontractors is addressed. This is followed by IHRM implication of language standardization. Moreover, the cultural host country and workplace environment are considered. Additionally, we provide a strategic approach of IHRM. Finally, we conclude with a discussion and contribution.

Key Words: Social Internationalization, Human Resource Management.

The Internationalization of Human Resource Management

Human Resource Management is more complex in international businesses, where management development, staffing, compensation activities, and performance evaluation are complicated by differences between legal systems, cultures, and economic systems within various labor markets, such as:

- Labor laws can prohibit union organization in one nation and mandate it in another.
- Compensation types vary from nation to nation.

International human resource management (IHRM) deals with a host of issues. It deals with developing managers to do business in different nations, and how to compensate people in different countries. Additionally, IHRM deals with a host of problems related to expatriate managers. An expatriate manager is a citizen of one nation who works abroad.

Staffing

Staffing policy involves the recruitment of employees for each individual job, and considers the skills required to do particular jobs. Staffing policies are able to support corporate culture surrounding the organization's value systems and norms.

We will show three types of staffing policies in international businesses: the polycentric approach, the ethnocentric approach, and the geocentric approach.

The Polycentric Policy

A polycentric staffing policy needs host-country nationals to be selected to manage subsidiaries, while the parent company deals with key positions at corporate headquarters. One advantage of applying a polycentric policy is that the company is suffers less from varying cultural aspects. Another advantage is that a polycentric policy is less expensive concerning the costs of value creation. Host-country managers have limited opportunities to gain experience in foreign countries and cannot progress in senior positions in their own subsidiary. Language barriers and national loyalties can isolate corporate headquarter staff from the various foreign subsidiaries. For example, Unilever's shift from a multi-domestic strategic posture to a transnational posture was very difficult.

The Ethnocentric Policy

An ethnocentric staffing policy concerns all key management positions filled by parent-country nationals. Companies such as Procter & Gamble, Matsushita, and Philips NV originally followed it. In various Japanese and South Korean enterprises such as Matsushita, Toyota, and Samsung, key positions in international operations are always held by home-country nationals.

Companies apply an ethnocentric staffing policy for various reasons. Firstly, enterprises believe that the host country lacks qualified persons to fill senior management positions in less developed nations. Secondly, a company looks at ethnocentric staffing policy as the best way to maintain corporate culture. Some Japanese companies like for their foreign

operations to be headed by expatriate Japanese managers because these managers have socialized into the firm's culture while employed in Japan. Thirdly, in order to create value by transferring core competencies to a foreign operation, it is believed that the best way to do this is to transfer parent-country nationals who have knowledge of that competency to the foreign operation. An ethnocentric staffing policy limits advancement opportunities for host-nation nationals. Additionally, expatriate managers are paid more than home country nationals. An ethnocentric policy can lead to the company's failure to understand host-country cultural differences.

The Geocentric Policy

A geocentric staffing policy finds the best workforce for key jobs throughout the organization, regardless of nationality which offers various advantages. It can set up the company for the best use of its human resources. Besides, it can build a cadre of international executives in a number of cultures. Applying geocentric policy can create value from the pursuit of experience and from the multi-directional transfer of core competencies as well as location economies. Other issues are that some countries want foreign subsidiaries to employ their citizens. Employers will apply for immigration to establish employment for the host-country national if that person has adequate and necessary skills.

Expatriate Procurement

One way to reduce expatriate failure rates is by improving recruitment procedures to screen out inappropriate candidates. Local performance and foreign performance potential are not the same thing. An executive who performs well in a local setting may not be able to adapt to managing in a different cultural setting. Four elements may predict success in a foreign posting:

- Perceptual ability. This is the capacity to know why people of other nations behave the way they do; that is critical for managing host-country nationals.
- Cultural aspect. Some countries' cultures are more unfamiliar and uncomfortable.
- Self-orientation. Expatriates with high self-confidence, self-esteem, and mental well-being may be successful in foreign posting, and adapt their interests in sport, food, and music; usually they are also technically competent.
- Others-orientation. The expatriate's ability to interact effectively with host-country nationals is key to success. Relationship development in long-lasting friendships with host-country nationals is necessary. Expatriate's willingness to utilize the host-country language indicates a willingness to communicate.

Compensation

How compensation is to be adjusted to show national differences in compensation practices and economic circumstances is important. How expatriate managers are paid is imperative to their success. Various differences occur in the compensation of executives at the

same level in various countries. In ethnocentric companies, this problem of how much home-country expatriates should be paid can be simplified. But in polycentric enterprises, the lack of managers' mobility among national operations means that pay can and ought to be kept country-specific. A geocentric staffing approach for a cadre of global managers may include many different nationalities.

Expatriate Pay Approach

The same purchasing power should be maintained across nations so the workforce is able to enjoy the same living standard in their foreign posting that they enjoyed at home.

Expatriate compensations consist of a base salary, allowances of various types, a foreign service premium, benefits, and tax differentials.

Foreign Service Premium

A foreign service premium is extra income the expatriate receives for working outside his country of origin. It gives an incentive to accept foreign postings. It compensates the expatriate for having to live in an unfamiliar nation, isolated from friends and family, and having to adapt to a new work situation.

Benefits

Expatriates many receive the same level of medical and pension benefits abroad as at home.

Taxation

The expatriate must pay income tax to both the host-country and the home governments. Companies can make up the difference when a higher income tax rate in a host nation decreases an expatriate's take-home pay.

Allowances

Four kinds of allowances play into an expatriate's compensation: housing allowances, hardship allowances, education allowances, and cost-of-living allowances. A hardship allowance pays for the expatriate being sent to remote location, for school costs, and for basic amenities such as health care on par with the expatriate's home nation. A cost-of-living allowance guarantees that the expatriate will enjoy the same standard of living in the foreign posting as at home. An education allowance gives an expatriate's children appropriate schooling by their home-country standards.

Base Salary

An expatriate's base income is normally within the same range as the base salary for a similar position in the home country. The base salary can be paid in either the domestic currency or the home-country currency.

Expatriate Managers' Training

Various reasons for expatriate management failure include the inability of the manager's or the manager's spouse to adept to a foreign environment. Cultural training, practical training, and language training can reduce expatriate failure.

Language Training

A willingness to communicate in the language of the host country, even if the expatriate is far from fluent, can build relations with domestic employees and improve the manager's effectiveness. Foreign languages are necessary for conducting business abroad in order to enable management to relate more easily to a foreign culture, and to build a better image of the company.

Practical Training

Practical training can help expatriate managers and their families to ease themselves into day-to-day life in the host country, and adapt successfully.

Culture Training

Understanding a host country's culture aids the manager in empathizing with the culture, which will enhance her or his effectiveness in coping with host-country nationals. Expatriates ought to receive training in the host country's culture, politics, history, religion, economy, and business practices as well as social behaviors. The spouse and family should be included in cultural training programs.

Management Development

Management development programs increase skill levels of managers through a mix of ongoing management education and rotations of managers through a number of jobs within the company to support varied experiences. They improve the overall quality and productivity of the company's management resources. Such companies require a strong unifying informal management network and corporate culture to assist in controlling and coordinating activities within the company. Socializing new managers into the value language or technical competencies and rotating them through different jobs in various countries and norms systems of the company is a good idea. Ericsson, for example, transfers core competencies and know-how from foreign subsidiaries to the parent, and from the parent to foreign subsidiaries, as well as between foreign subsidiaries.

Training and Development

Training for the manager aims at building that manager's competence to perform a specific job in a foreign position. Management development is simply a program to develop the manager's skills over her or his career with the company and to build experience as well as cross-cultural sensitivity, which should enhance management and leadership skills.

International Labor Relations

A company's capacity to integrate and consolidate international operations to realize location economies can be limited by organized labor. Labor unions try to receive greater job security, better pay, and better working conditions for their members through collective bargaining with management by strike or work protest such as (refusing to work overtime). Multinational companies' bargaining power comes from the power to move production to another nation. Organized labor responds to the augmented bargaining power of multinational companies by taking various actions:

- establishing international regulations on multinationals through United Nations
- installing international labor organizations
- lobbying for national legislation to restrict multinationals.

Organized labor has met with limited success in its effort to get national global bodies to regulate multinationals. International Labor Organization (ILO) and the organization for Economic Cooperation and Development (OECD) have established work agreements for multinational companies to follow in labor relations.

Performance Evaluation

We are able to decrease bias in the performance evaluation process to evaluate variables that are critical aspects of an expatriate's performance. A former expatriate who served in the same location ought to be involved in the evaluation to reduce bias.

Contribution

This topic contributes to the understanding of:

- Research, which shows that many expatriate workforces encounter problems that limit both their effectiveness in a foreign posting and their contribution to the enterprise when they return home.
- The discussion of the advantages and disadvantages of polycentric, ethnocentric, and geocentric staffing policy.

IHRM in the Host Nation Context

International human resource management supports more than international assignments and management. This chapter deals with various themes to global HR. The chapter concerns HRM in the host-country context. We first study the question of whether the multi-national can standardize its work practices or if factors in host nations force implications and adaptations for IHRM. Factors such as mode of operation, host-nation culture, maturity, firm size, subsidiary mandate, and international experience are examined. We also look at IHR practices for retaining, developing and retrenching domestic staff and the HR implications of standardizing communication through controlling IHR practices and adapting a common corporate language applied by foreign subcontractors. Other issues concern industrial relations, such as the interaction between international trade unions, and issues in the global and regional level labor force

context, for example, in the European Union. While the international nature of business might call for increased consistency, the variety of cultural environments might call for differentiation.

In practice, the following conditions ought to be met:

- Willingness of headquarters staff not only to acknowledge cultural difference but also to take active part in cultural practices where appropriate.
- Parent company's own special channel of managing human resources should reflect some values and assumptions of its home culture.
- Real genuine belief by all parties involved that more creativity in managing people can be developed as a result of cross-cultural learning.
- Parent company organization exhibits strengths and weaknesses, especially abroad.

Effective international management requires sensitivity to various host-country requirements about employment, for example, hiring, promotion and reward practices, and respect for local customs.

Controlling IHRM Practices of Host Nation Subcontractors

A crucial problem is the management of the extended global supply chain and ensuring that quality standards are met. However, especially for multinationals with well-known brands, for example, Levi Strauss, Nike, Reebok, Benetton, and Adidas, the critical management challenge has been the reaction of its Western customers to employment practices and supplies

by its subcontractors in nations such as China, India, Indonesia, Turkey, Honduras, El Salvador, the Philippines, and the Dominican Republic. Many are accused of condoning despicable work practices such as the application of long working hours for minimal pay, child labor and unsafe working environments, and working conditions that would not be allowed in their home nations.

Various multinationals' valuable brands and corporate reputations rapidly introduce their own agreements which subcontracting companies must sign on to. These agreements are composed of acceptable working conditions, minimum wages, and non-use of child labor. There is now a universal standard, named the Social Accountability 8000, whose principles are drawn from United Nations human rights conventions.

Large multinationals find it challenging to ensure adherence to work agreements within their own subsidiary operations. Domestic joint venture partners monitor the day-to-day operations of the international joint venture (IJV), and how many staff the multinational can place in the IJV to oversee adherence to its work agreement relating to work practices, for example, in safety and health issues as well as compliance to domestic labor regulations and laws.

IHRM managers ought to play the following roles:

- Makes visits to global subcontractors each period.

- Reviews appraisal and reward systems, taking into consideration compliance to work agreements.
- Reviews work condition agreements.
- Analyzes cost-benefit of an expatriate stationed in the nation and oversees subcontractor compliance.
- Trains domestic consumers and agents in elements of the work agreement so that they can control subcontractors' adherence to quality checks and workplace practices.

IHRM Implications of Language Standardization

Language standardization helps informal communication through the development of intra-organizational networks. Language standardization pressed on employees helps them to become competent in the corporate language and carries an implicit message concerning career development. The common language should be applied through training and development programs. The present attraction of India over China for business process outsourcing and IT is partly due to the size of its English-speaking population. Business reality for multinationals transitioning into foreign markets through an acquisition or merger, or IJV which has been redeployed from the domestic partner's operation, is that buying into English language skills is essential.

Cultural Host Country and Workplace Environment

Appropriate behavior should be instilled in the local workforce through hiring practices and training programs as well as through the international's way of operating, which has been accepted in the manner intended. The effectiveness of expatriates as agents of socialization have led multinational to localize management prematurely. Factors that affect standardization are workplace environment and host-country culture, operation, the maturity and size of a company, as well as the importance of the subsidiary. National culture is a variable in IHRM society, and that group shares a distinct life with attitudes, common values, and behaviors that are transmitted over time in a dynamic process. Work behavior is culturally influenced and built into expectations and role definition. Common corporate culture may be crucial for cohesion. Standardization of work practices concerns behavior modification through staff rotation, corporate training programs, promotions, and rewards, most of which fall into the ambit of the international human resource function.

A multinational's capacity to impose standardized work practices is affected by cultural differences that can create resistance to change from subsidiary staff. An acquisition can provide the multinational with market advantages, but its ability to transfer systems, technical knowledge, and HR practices may be restricted. The domestic firm requires investment and restructuring to make it operable. As well, this should include human resources, with a high demand on expatriates initially. Companies that take a longer-term view seek to influence the

work practices and operations of the IJV. HR needs time and considerable effort to integrate domestic IJV managers into the global family. The international managing enterprise undertakes the usual management functions as well as provides skills, expertise, resources, and trains the domestic employees. Management contracts are effective ways of operating internationally. Host governments look at the management contract as the importer of inappropriate technology and as foreign control of domestic operations. Domestics own facilities while foreign managers run it. This gives the multinational considerable power over sourcing of materials, resources, and day-to-day operations.

Critical factors influencing multinational operations are the size and maturity of the international. Smaller multinationals and newcomers to international business do not have the same level of resources or ability as do larger, more established multinationals; therefore, an alternative mode of operation such as a joint venture can become an attractive proposition. While the selection practices used in different nations are inching toward international convergence, we expect domestic cultures to continue affecting the hiring practices. Human resource managers are required to be culturally sensitive when devising the procurement systems in various cultural environments. The 'best global resource management practices' may be the ones *best* adapted to domestic and cultural difference. Chinese managers lack decision-making skills, and corporate

management training is needed that provides IHRM skills appropriate to the Chinese skills, within the context of problem solving in high-pressure situations.

Discussion

The discussion of international HRM issues generally tends to be biased in the direction of expatriate management, essentially that of parent-country nationals, partly owing to their strategic importance. In this chapter, we try to redress the balance by examining IHRM issues in subsidiary operations. We study the following topics:

- Developing local staff.
- Controlling IHR practices applied by foreign subcontractors.
- Factors influencing adaptation of work or standardization practices, and the role of IHRM including workplace environment and host-country culture, firm size, mode of operation, international experience and maturity as well as subsidiary mandates.

Contribution

This section concentrates on problems relating to IHRM and work practices in the host-country context. We have studied:

- Controlling the IHRM practices of international subcontractors by using work agreements.
- The skill level of the local workforce, cheap labor, and training are examined.

- The adaptation and standardization debate as it relates to subsidiary operations;
 - We study management contracts as a mode of operation that may influence standardization of work practices in foreign countries.
 - The host-country culture and workplace environment as contributes to work outcomes.
- To recommend IHRM implications of language standardization. The application of a corporate language, usually English, has implications for subsidiary staff in areas such as recruitment for positions, attendance at enterprises, promotions, and training programs.

Conclusions

International human resource management (IHRM) has progressed rapidly into new academic legitimacy and professionalism, and is penetrating at institutional, national and international levels. Multi-national and international companies are faced with the complexity of cross-national and cross-cultural issues. In this framework, international HRM (IHRM) has emerged and gained legitimacy.

Nowadays, international human resource management struggles to understand just what is involved in basic IHRM ethics, especially when considering what the global HR manager ought to do when an employment practice is viewed as wrong in the home country or illegal but is acceptable and legal in the host country. As well, what to do when foreign standards or attitudes

are viewed as lower than those held in the home country; for example, race or sex discrimination in hiring, compensation, or job placement; providing unsafe working conditions; or apply of child labor.

Researchers study the contemporary challenges facing IHRM and offer insights into some of its many confusing issues. They must take note that internationalization and globalization of trade have essentially transformed the challenges facing the workforce in the twenty-first century. Although technological advancements encourage faster transportation of services, goods, and information, and by doing so help further cross-fertilize advancements and technological innovation, the new ethic is for fostering such innovations and developments within the management of human resources. Such cross management ideas, principles, and values in IHRM need comparative insights from a field of management practice and study.

The research concentrates on International Human Resource Management. IHRM activities composed of human resource, staffing, management development, performance appraised evaluation, labor relations, and compensation. The research also presents the following aspect:

- Expatriate failure is able to be decreased by recruitment procedures that screen out inappropriate candidates. The successful expatriates possess self-confidence and self-esteem.

- International business needs IHRM policies to follow the company's strategy and with its informal and formal structure and controls.
- Staffing policy concerns recruiting employees who have the skills needed to conduct special jobs. Staffing policy is a tool for promotion and development.
- A polycentric approach appeals to host-country nationals to manage foreign subsidiaries and parent-country nationals in key positions.
- An ethnocentric policy fills key management positions with parent-country nationals.
- A geocentric policy finds the best person for crucial jobs regardless of their nationality.
- It is difficult to appraise the performance of expatriate managers objectively.
- Country differences in compensation are difficult in that different standards are adopted in each nation.
- Expatriate pay considers equalized purchasing power so the workforce is able to enjoy the same living standards in their foreign posting as they had at home.
- Training concerns language training, cultural training, and practical training, to both the spouse and family of the expatriate manager, as well as to the manager.
- Management development tries to augment the skill levels of managers' education and to rotate them throughout the company, to build informal management networks and a strong unifying culture.

- Labor Union can have bargaining power with threats to move production to other nations.

References

- Anthony F Buono, 2005, "Mergers and Acquisitions: Managing Culture and Human Resources," *Administrative Science Quarterly*. Ithaca: Dec, Vol. 50, Iss. 4; p.647.
- Beaman, Karren V, International Association for Human Resource information Management, 2002, *Boundary less HR: Human Capital Management in the Global Economy*, Austin, Tex.: IHRM.
- Briscoe, Dennis R., 2004, *International Human Resource Management: Policies & Practices for the Global Enterprise*, *Global Enterprise*, London: Routledge.
- Cristina B Gibson, Mary E Zellmer-Bruhn, 2001, "Metaphors and meaning: An Intercultural Analysis of the Concept of Teamwork, *Administrative Science Quarterly*. Ithaca: Jun. Vol. 46, Iss. 2; p.274.
- Dowling, Peter., Welch, Denice E. 2004, *International Human Resource Management: Managing People in a Multinational Context*, London: Thomson.
- Dowling, Peter J., Welch, Denice E., Schuler, Randall S. 1994, *International Dimensions of Human Resource Management*, Belmont, Calif.: Wadsworth.
- Dowling, Peter., Welch, Denice E Schuler, Randall S. 1999, *International Human Resource Management: Managing People in a Multinational Context*, Cincinnati, HO: South – Western College Publ.
- Evans, Paul, Pucik, Vladimir., Barsoux, Jean-Louis. 2002, *The Global Challenge : Frameworks for International Human Resource Management*, Boston, Mass. : Bangkok: McGraw-Hill.

- Hendry, Chris., 1994., *Human Resource Strategies for International Growth*, London: Routledge.
- Jain, Harsh, Murray, Victor, 1984, “Why the Human Resources Management Function Fails,” *California Management Review*. Berkeley: Summer, Vol. 26, Iss. 4; p.95.
- James N Baron, David M Kreps, 1999, “Consistent Human Resource Practices,” *California Management Review*. Berkeley: Spring, Vol. 41, Iss. 3; p. 29.
- Laurie Bassi, Daniel McMurrer, 2007, “Maximizing Your Return on People,” *Harvard Business Review*. Boston: March, Vol. 85, Iss. 3; p. 155.
- McCabe, Douglas M., Lewin, David, 1992, “Employee Voice: A Human Resource Management Perspective,” *California Management Review*. Berkeley: Spring 1992. Vol 34, Iss. 3; p. 112.
- Mendenhall, Mark A., Oddou, Gary R. 2000., *Readings and Cases in International Human Resource Management*, Cincinnati, Ohio: South-Western College Pub.
- Need, Albert., Singapore Institute of Personnel Management. 1990, *International Human Resource Management Review*., Singapore: Singapore Institute of Personnel Management.
- Ozbiligin, Mustafa. 2005., *International Human Resource Management: Theory and Practice*, Houndmills, Basingstoke, Hampshire; New York: Palgrave Macmillan.
- Schuler, Randall S., Jackson, Susan E., Luo, Yadong. 2004, *Managing Human Resources in Cross-Border Alliances*, New York: Routledge.
- Sigal G Barsade, Andrew J Ward, Jean D F Turner, Jeffery A Sonnenfeld. 2000, “To Your Heart’s Content: A Model of Affective Diversity in Top Management Teams,” *Administrative Science Quarterly*. Ithaca: Dec, Vol. 45, Iss. 4; p. 802.

A GRAPH-BASED APPROACH FOR MINING CLOSED LARGE ITEMSETS

Lee-Wen Huang
Dept. of Computer Science and Engineering
National Sun Yat-Sen University
huanglw@gmail.com

Ye-In Chang
Dept. of Computer Science and Engineering
National Sun Yat-Sen University
changyi@cse.nsysu.edu.tw

Abstract

"Data Mining" means a process of nontrivial extraction of implicit, previously and potentially useful information from data in databases. Mining closed large itemsets is a further work of mining association rules, which aims to find the set of necessary subsets of large itemsets that could be representative of all large itemsets. In this paper, we design a graph-based approach, considering the character of data, to mine the closed large itemsets efficiently. Two features of market basket analysis are considered – the number of items is large; the number of associated items for each item is small. Combining the cut-point method and the clique concept, the new algorithm can find the closed large itemsets efficiently. The simulation results show that the new algorithm outperforms the FP-Growth algorithm in the execution time and the space of storage.

Keywords: Association Rule, Closed Large Itemsets, Data Mining, Graphic-Based Mining

Introduction

In recent years, with the computers and information industries growing more and more rapidly, various data around us become more complex and huge. Commercial behavior, scientific statistics, natural phenomena and DNA projects are some examples to produce lots of data every day. In the past, we may put these data in drawers or databases to extract some information efficiently. However, as the amount of data grows, it becomes very difficult to determine the useful data. Generally speaking, there are four kinds of problems that we have met (Agrawal and Srikant, 1995; Han et al., 2007; Lucchese et al., 2006; Srikant and Agrawal, 1996; Zaki, 1998). First, there are too much information for us to digest. Second, it is difficult to recognize the reality of the information. Third, it is hard to guarantee the security of these information. Finally, we cannot deal with different forms of information easily because of much data. In order to solve these four problems, people start to think how to find useful knowledge without overwhelming by information flooding. Although recent database management systems can provide quick insertion, deletion, query and statistic, they cannot detect the relations and rules between data. So, there comes a research named *data mining* which is used to help making decisions and information retrieval.

Data mining is one kind of analysis techniques which are data driven. This is different from Online Analytical Processing (OLAP) as well as the ad-hoc query and reporting approach,

both of which are hypothesis driven (Kamath, 2001). A hypothesis is formulated by the query types. That is, if a pattern cannot be formulated, we cannot use the hypothesis to find this pattern. However, since data mining is data driven, it is not important whether we know the rules or query types, the expected patterns will be discovered in the process of data mining.

There are many methods for data mining, such as *association rule mining*, *sequential pattern mining*, *attribute oriented induction*, *data classification*, *data clustering*, *pattern-based similarity search*, and *data cube* (Lee, 2007). The tasks of finding association rule in large databases will bring lots of benefits for many applications, such as bioinformatics, market-basket analysis, customer relationship management (Kamath, 2001), etc. There are several Apriori-based algorithms, such as Apriori All (Agrawal and Srikant, 1995) and GSP (Srikant and Agrawal, 1996), have been proposed. However, their search space is extremely large. For example, with m attributes, there are $O(m^k)$ potentially frequent sequences of length k . With millions of objects in the database, the problem of I/O minimization becomes paramount. Moreover, these algorithms are iterative in nature. Therefore, they need to scan the whole database many times, which is obviously very expensive in I/O cost (Zaki, 1998).

A large itemset X is closed if there is no large itemset X' such that (1) $X \subset X'$ and (2) \exists transaction T , $X \subset T \rightarrow X' \not\subset T$. For example, if we have the set of frequent itemsets S is $\{(x):3,(y):3, (z):2, (x, y): 3, (x, z):2, (y, z):2,(x, y, z): 2\}$, then the related set of closed frequent

itemsets $C = \{(x, y): 3, (x, y, z): 2\}$. All large itemsets can be obtained from closed large itemsets without losing support information.

However, the large itemsets may not always correlate with each other (Huang and Chang, 2009). Ohsawa and Yada incorporate full consideration of two distinct features of market basket analysis into the algorithm design (Ohsawa and Yada, 2009). The first feature is that the number of items can be large; the second feature is that the number of associated items for each item is relatively small. In this paper, we propose a new graphic-based algorithm, the GCFP algorithm, to discover the closed large itemsets. We conduct several experiments using different synthetic datasets. These simulation results show that the proposed algorithm outperforms the FP-Growth algorithm in all datasets. The main reason is that our algorithm could generate the densely structure than the FP-Growth algorithm.

The rest of the paper is organized as follow. Section 2 gives a survey of several well-known data mining algorithms for association rules. In Section 3, we present a new graph-based algorithm for mining closed large itemsets. In Section 4, we give a comparison of the performance of the FP-Growth algorithm and our proposed algorithm. In Section 5, we give a summary and point out some future research directions.

Related Work

Apriori

Agrawal and Srikant proposed the Apriori algorithm (Agrawal and Srikant, 1994) for mining association rules. This algorithm generates the candidate itemsets to be counted in an iteration by using only the itemsets found large in the previous iteration. This reduces the number of candidate itemsets. However, for each candidate itemset, it needs to count its appearances in all transactions. In this algorithm, each iteration requires one pass over the database and it wastes a lot of time.

FP-Growth

Unlike Apriori, Han proposed the FP-Growth algorithm (Han et al, 2007) for mining association rules. First, a data structure, called the FP-Tree, is constructed, which is an extended prefix-tree structure storing crucial, quantitative information about large itemsets. Only L1 will have nodes in the tree, and the tree nodes are arranged in such a way that more frequently occurring nodes will have better chances of sharing nodes than less frequently occurring ones. Second, an FP-Tree-based pattern fragment growth mining method, is developed, which starts from L1, examines only its conditional pattern base, constructs its conditional FP-Tree, and performs mining recursively with such a tree.

The Graphic Representation

Huang and Chang proposed the GAR algorithm (Huang and Chang, 2009). We give a simple example to illustrate how to denote large itemsets by using the graphic representation. An

example is given in Figure 1. In the first iteration, we scan all the transactions to count the number of occurrences for 1-itemsets and 2-itemsets. Assuming that the minimum transaction support is two, the set of large 1-itemsets, $L1$, and 2-itemsets, $L2$, can then be determined. Then, we let each item be a node in the graph, and draw a line from A to B if $\{A,B\}$ is a large 2-itemsets. As observed in (Agrawal and Srikant, 1994), any subset of a large itemset must be a large itemset by itself. That is, $\{A,B,C\}$ in $L3$ implies $\{A,B\}$ in $L2$, $\{A,C\}$ in $L2$ and $\{B,C\}$ in $L2$. Based on this observation, if $\{A,B,C\}$ in $L3$, the degree of node A must be greater than 2 or equal to 2. So, we can discard the nodes whose degree is less than 2. For example, the degree of node I is 0, and the degree of node K is 1. These nodes cannot appear in $L3$. Finally, we can get the large itemsets, $\{A,B,D\}$, $\{B,C,D\}$ and $\{F,G,H\}$. The total number of nodes in the GFP-Forest is 10, whereas the total number of nodes in the FP-tree is 27 which represents a reduction ratio of 2.7.

TID	Items
1	ABDE
2	AJL
3	DEFKL
4	BCDJ
5	CKL
6	ABCD
7	DEI
8	BCDFHG
9	JK
10	FGHIJ

Figure 1. Database D

The Graph-Based Approach

In this section, we propose the GCFP algorithm. It represents the large itemsets as a graph, which constructs a graph based on L2. Based on the property of the graph, we partition the graph into different sub-graphs, which results in the process time of mining association rules can be reduced.

The Algorithm

GCFP Algorithm is shown as Figure 2. We use the same example, which is given in Figure 1, to go through the algorithm. First, we generate L1 and L2 by scanning database once. We count 1-itemsets in an array. In the same time, we count 2-itemsets in a sparse matrix, in which only the lower triangular part is used. Then, we check whether the minimum support requirement is met.

```
Procedure GCFP;  
Begin  
GenerateL1L2();  
ConstructGraph();  
CutGraph();  
FindClique();  
ConstructGCFP-Forest();  
End;
```

Figure 2. The GCFP Algorithm

Second, based on L2, we call procedure ConstructGraph to construct the graph and assign the different group number to the disconnected graphs. Next, we use the cut-point property of the graph to divide a graph. A connected undirected graph is biconnected if there are no vertices whose removal disconnects the rest of the graph. If a graph is not biconnected, the vertices whose removal would disconnect the graph are known as cut points. Depth-first search provides a linear-time algorithm to find all cut points in a connected graph. First, starting at any vertex, we perform a depth-first search and number the nodes as they are visited. For each vertex V , we call this preorder number $V.Num$. Then, for every vertex V in the depth-first search spanning tree, we compute the lowest-numbered vertex, which we call $V.Low$, that is reachable from V by taking zero or more tree edges and then possibly one back edge.

Then, we call procedure CutGraph to divide the graphs to sub-graphs. Based on groups, we transform the database D to database D', as shown in Figure 3. Then, we find the maximal cliques and construct the GCFP-Forest using the similar structure of FP-tree. Finally, we can get the closed large itemsets, {A,B,D}, {B,C,D}, {F,G,H}, {B,D}, {D,E}, {D,F}, {K,L}, {A}, {C}, {D}, {E}, {F}, {I}, {J}, {K}, and {L}.

TID	Items	
1	ABDE	DBA
2	AJL	A
3	DEFKL	D, F
4	BCDJ	DBC
5	CKL	C
6	ABCD	DBCA
7	DEI	D
8	BCDFHG	DBC, FGH
9	JK	(null)
10	FGHIJ	FGH

Figure 3. Database D'

Performance

In this Section, we study the performance of the proposed algorithm. In this paper, we only make a comparison of our proposed algorithm with the FP-growth algorithm. Our experiments were performed on a Pentium Dual-Core personal computer with one CPU clock

rate of 2.7 GHz, 2GB of main memory, running Windows XP Professional, and coded in Java.

The data was stored on a local 500G IDE 3.5" drive.

Generation of Synthetic Data

We generated synthetic transactions to evaluate the performance of the algorithms over a large range of data characteristics. The synthetic data is said to simulate a customer buying pattern in a retail environment. The parameters used in the generation of the synthetic data are shown in Table 1. The length of a transaction is determined by a Poisson distribution with mean μ equal to $|T|$. The size of a transaction is between 1 and $|MT|$. The transaction is repeatedly assigned items from a set of potentially maximal large itemsets F , until the length of the transaction does not exceed the generated length.

The length of an itemset in F is determined according to a Poisson distribution with mean μ equal to $|I|$. The size of each potentially large itemset is between 1 and $|MI|$. Items in the first itemset are chosen randomly from the set of items. To model the phenomenon that large itemsets often have common items, some fraction of items in subsequent itemsets are chosen from the previous itemset generated. We use an exponentially distributed random variable with mean equal to the correlation level to decide this fraction for each itemset. The remaining items are picked at random. In the datasets used in the experiments, the correlation level was set to 0.5. Each itemset in F has an associated weight that determines the probability that this itemset will

be picked. The weight is picked from an exponential distribution with mean equal to 1. The weights are normalized such that the sum of all weights equals 1.

Table 1. Parameters

$ D $	Number of transactions
$ T $	Average size of transactions
$ MT $	Maximum size of the transactions
$ I $	Average size of maximal potentially large itemsets
$ MI $	Maximum size of the potentially large itemsets
$ L $	Number of maximal potentially large itemsets
N	Number of items

For example, suppose the number of large itemsets is 5. According to the exponential distribution with mean equal to 1, the probabilities for those 5 itemsets with ID equal to 1, 2, 3, 4 and 5 are 0.43, 0.26, 0.16, 0.1 and 0.05, respectively, after the normalization process. These probabilities are then accumulated such that each size falls in a range. For each transaction, we generate a random real number which is between 0 and 1 to determine the ID of the potentially large itemset. To model the phenomenon that all the items in a large itemset are not always bought together, we assign each itemset in F a corruption level c . When adding an itemset to a transaction, we keep dropping an item from the itemset as long as a uniformly distributed random number (between 0 and 1) is less than c . The corruption level for an itemset

is fixed and is obtained from a normal distribution with mean = 0.5 and variance = 0.1. Each transaction is stored in a file system with the form of <transaction identifier, item>.

Some different data sets were used for performance comparison. Table 2 shows the names and parameter settings for each data set. For all data sets, N was set to 1,000 and |L| was set to 2,000.

Table 2. Parameters values for synthetic dataset

Case	Name	T	MT	I	MI	D
1	T5.I2.D20K	5	10	2	4	20K
2	T10.I6.D50K	10	15	6	10	50K

Simulation Results

In our simulation result, the performance measures which we concern about are the CPU execution time of the computation and the sensitivity to parameters.

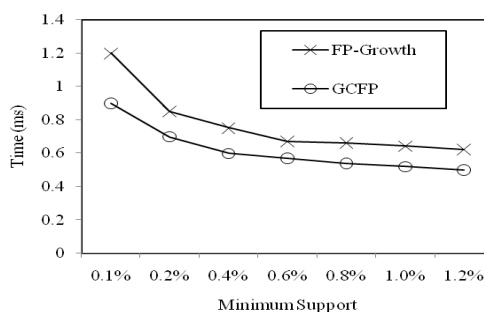


Figure 4. The relationship between the execution time (seconds) and the minimal support (Case1)

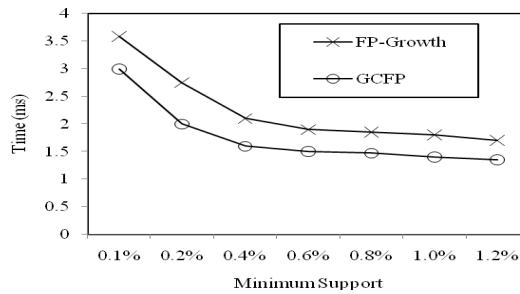


Figure 5. The relationship between the execution time (seconds) and the minimal support (Case2)

From the above comparisons, we can see that our algorithm is always faster than the FP-Growth algorithm.

Conclusion

In this paper, we have proposed a graphic-based algorithm for mining large itemsets. In this section, we give a summary of this paper and point out some future research directions. We have presented the proposed graphic-based algorithm for mining closed large itemsets. We have made a comparison of execution time between the proposed algorithm and the FP-Growth algorithm by simulation. We have conducted several experiments using different synthetic datasets. The simulation results have shown that our algorithm could provide better performance than the FP-Growth algorithm in terms of the processing time.

Acknowledgement

This research was supported in part by the National Science Council of Republic of China under Grant No. NSC-93-2213-E-110-003. The authors also like to thank ``Aim for Top

University Plan" project of NSYSU and Ministry of Education, Taiwan, for partially supporting the research.

References

- Agrawal, R. and Srikant, R. (1994) 'Fast Algorithms for Mining Association Rules', *Proc. of the 20th Int. Conf. on Very Large Data Bases*, pp. 487--499.
- Agrawal, R. and Srikant, R. (1995) 'Mining Sequential Patterns', *Proc. of the 11th Int. Conf. on Data Engineering*, pp. 3--14.
- Han, J., Cheng, H., Xin, D., and Yan, X. (2007) 'Frequent Pattern Mining: Current Status and Future Directions', *Data Mining and Knowledge Discovery*, Vol. 15, No. 1, pp. 55--86.
- Huang, L. W. and Chang, Y. I. (2009) 'An Efficient Graph-Based Approach to Mining Association Rules for Large Databases', *International Journal of Intelligent Information and Database Systems*, Vol. 3, No. 3, pp. 274-259.
- Kamath, C. (2001) 'The Role of Parallel and Distributed Processing in Data Mining', Tech. Rep. UCRL-JC-142468, *Newsletter of the IEEE Technical Committee on Distributed Processing*.
- Lee, W. P. (2007) 'Introduction to Data Mining'. http://www.datamining.org.tw/dl/checkload1.asp?data_no_68.
- Lucchese, C., Orlando, S., and Perego, R. (2006) 'Fast and Memory Efficient Mining of Frequent Closed Itemsets', *IEEE Trans. on Knowledge and Data Engineering*, Vol. 18, No. 1, pp. 21--36.
- Ohsawa, Y. and Yada, K. (2009) 'Data Mining for Design and Marketing', Chapman & Hall/CRC Data Mining and Knowledge Discovery Series.

Srikant, R. and Agrawal, R. (1996) 'Mining Sequential Patterns: Generalizations and Performance Improvements', *Proc. of the 5th Int. Conf. on Extending Database Technology*, pp. 3--17.

Zaki, M. J. (1998) Efficient Enumeration of Frequent Sequences', *Proc. of the 7th Int. Conf. on Information and Knowledge Management*, pp. 68--75.

A FIT PERSPECTIVE: A CRITICAL FACTOR TO
COMMUNICATION MARKETING

Dong-Jenn Yang

Department of Business Administration

I-Shou University, Taiwan

alimama@isu.edu.tw

Chen-Yin Liu (Corresponding Author)

Postgraduate Programs in Management

I-Shou University / Digital Media Design

Tzu-Hui Institute of Technology, Taiwan

chenyinliu@hotmail.com

Hsiung-Peng Huang

Macau University of Science and Technology

Taipa, Macau

400702@yahoo.com.tw

Shu-Wan Yang

Department of Business Administration

I-Shou University, Taiwan

rones45@yahoo.com.tw

Abstract

This study is tried to investigate the impact on advertising effectiveness via a fit perspective. Particularly we concentrated on the fit strategies among advertising appeal, product type and involvement. In study advertising appeal was divided into rational and emotional

appeals, and four kinds of product type were introduced according to high rational/high emotional, high rational/low emotional, low rational/high emotional and low rational/low emotional. Based on above 8 advertising copies were designed, and the involvement, classified into high involvement and low involvement, were considered jointly to measure advertising effectiveness. The results showed that different fit models lead to different advertising effectiveness. According to the finding three kinds of fit models resulted a better impact on advertising effectiveness, they were: (1) low-rational product with emotional appeal, (2) low involvement with low-rational product, and (3) high involvement with rational appeal. At the end we proposed some suggestions.

Key Words: Fit Perspective, Advertising Appeal, Product Type, Involvement,
Advertising Copy Design

Introduction

With the advancement of media and information technology, the messages received by consumers not only became more flooding and complex, but also causing them more difficult to make purchasing decisions. The advertising is a main tool to communicate with the target consumer, and a best predictor of their purchasing behaviors (Thorson, Chi and Leavitt, 1992). Therefore an effective advertising strategy is allowing the target consumer to correctly and accurately perceive the message delivered by advertiser.

Communication and persuasion theory revealed that a persuasive message should firstly get the recipient's attention, comprehension and acceptance, and then to change his (her) attitude and behavior (Fishbein and Ajzen, 1975; Hovland and Janis, 1959). How can the effectiveness of an advertisement be influenced? Previous studies have mostly focused on advertising appeals,

positive/negative messages, involvement and cognitive demand. But how these variables fit with each other to reach the best advertising effectiveness remain unclear.

The purpose of this study is to investigate how the advertising effectiveness differs when: (1) different advertising appeals fit different products types, (2) different advertising appeals fit different levels of involvement, (3) different product types fit different levels of involvement.

Literature Review

Advertising Appeal

The purpose of advertising appeal not only clearly expressed an interest, motivation, identity or reasons, but also explain why consumers should concerned about or to purchase the product (Kotler, 1991). Advertising appeals were first divided into rational, emotional and moral appeals (Kotler, 2003). Due to moral appeal has an overlap controversy with rational and emotional appeals the most common category of advertising appeal in use is rational and emotional.

Rational appeal is the logical way of thinking, to the interests of the demands of consumers for trying to influence cognition and behavior. While emotional appeal is a kind of commitment of the advertisement, through this commitment to meet consumers' social needs or psychological needs. Emotional appeal belongs to a touching power strategy, to meet the demands of the state

of mind, and to influence the attitude of consumers. In this study the advertising appeals are divided into rational and emotional as usual.

Product Type

Copeland (1923) was the first to classify consumer goods into three types (convenience, shopping and specialty). Many marketing studies followed his classification schemes, and resulted in consistent findings (Murphy and Enis, 1986). Bucklin's (1976) review of the retail strategy study, consumer goods were divided into convenience, specialty, shopping (low intensity), shopping (high intensity). Holbrook and Howard (1977) added the fourth product type (preference goods) according to the original three categories of Copeland. In fact, preference goods were similar to shopping (low intensity) goods in Bucklin's classification schemes.

Vaughn (1980) argued that ignoring the emotional factors consumer behavior based on rational decision theory was not complete, and developed a classification model, also known as FCB (Feeling Consumption Behavior) mode, by using "involvement" and "rational / emotional," two consecutive dimensions.

In this study consumer goods were divided into four types (high rational/high emotional, high rational/low emotional, low rational/high emotional and low rational/low emotional) according to consumer's emphasis on ration or emotion in course of purchase (Hong and Lin, 1994; Lin et al., 1994). For high rational/high emotional products consumers would not only

consider the product features and quality characteristics, but also care the psychological and emotional factors. For high rational/low emotional products consumers emphasized on the product functions, quality and benefit. For low rational/high emotional products quality among different brands was almost alike, thus consumers emphasize more on emotional factors. For low rational/low emotional products there was little difference among their attributes, and consumers would focus on prices.

Involvement

The concept of involvement came from the research of advertisement (Krugman, 1965). Involvement is seen as an individual difference variable. In course of communication with consumers involvement is a key factor for making decision (Petty and Cacioppo, 1981). When customers are in high level of involvement their attitudes towards product are usually more persistent, sustainable, consistent and not susceptible to the message. Compared to those with high involvement, customers with low involvement are negative and passive to do information search. They are not willing to spend too much time to think and evaluate the message content and product features, so that such consumers are classified as in low product knowledge (Brucks, 1985). The level of involvement really matters a wide variety of consumer behaviors. In recent years, related research has become the main stream of consumer behavior research. Experts

suggest that advertisers should make different ad strategies and marketing strategies due to different level of involvement.

Advertising Effectiveness

Normally there are two dimensions (communication effectiveness and sales effectiveness) to evaluate advertising effectiveness. Communication effectiveness is mainly to investigate a series of inner process (such as awareness-knowledge generating-understanding-memory-attitude formation) after consumer receiving the stimulus of advertising messages (Fishbein and Ajzen, 1975); Kotler, 1994). Advertising recall rate, ad attitude, brand attitude and product attitude are commonly used to measure advertising effectiveness by scholars. Sales effectiveness is primarily interested in the actual purchase behavior of consumers but it is not the main focus of this study.

Fit Perspective

"Fit" is the core concept of contingency theory. The state of the organization is a dynamic and open system. If the different components in organization can fit with each other, and have full co-operation then the organization will have a better performance.

Applications in Marketing, such as research on product and spokesmen (Kamins, 1990; Ohanian, 1991), sports sponsorship and company image (Speed and Thompson, 2000), and selective strategies of decision-making (Avent and Higgins, 2006), the higher the level of fit, the more positive attitudes would be, and consumers were more willing to buy and to use.

Research Framework and Hypothesis

Companies must have different advertising strategies for different target groups. The advertising message really can attract consumers and guide them to purchase. Therefore, this paper proposes three models from a fit perspective as shown in Figure 1.

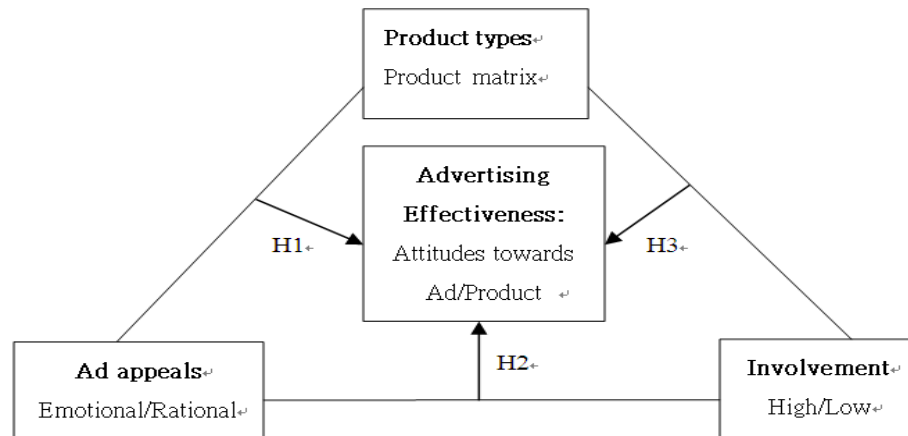


Figure 1. Research Framework

Persuasive effects of advertising appeals should be consistent with the product types (Johar and Sirgy, 1991; Laskey et al., 1995; Liebermann and Flint-Goor, 1996; Shimp, 1981). when the advertising appeals matched with product types, there was a better performance on advertising attraction, product quality, product image and company image (Peterson and Kerin, 1977). Especially for new product to achieve advertising effectiveness, it was very crucial to identify the fit between the product features and advertising appeals (Lin and Tu, 2006).

The stimulation towards consumers not only come from the product features in ads, but also may come from the ads themselves (Scott et al., 1990) and some evidences showed that

rational appeal had more significant positive impact than emotional appeal (Coulson, 1989; Lin et al., 2008). This study makes the following hypothesis:

Hypothesis 1a. For high rational/low emotional product, advertising effectiveness of rational appeals perform better than those of emotional appeals.

Hypothesis 1b. For low rational/high emotional product, advertising effectiveness of emotional appeals perform better than those of rational appeals.

The level of consumers' involvement to related product will have a significant difference in advertising effectiveness. Products with high involvement emphasize on physical attributes, while products with low involvement emphasize on intangible attributes. Based on Elaboration Likelihood Model (ELM; Petty and Cacioppo, 1986), researchers found that the levels of consumer involvement have a moderating effect (Wang et al., 2006). Besides, in the combination of related advertising and one-side advertising appeal consumers with high involvement have a more significant impact than consumers with low involvement. In the combination of related advertising and two-side advertising appeal consumers with low involvement have a more significant impact than consumers with high involvement (Lin and Lin, 2005). Therefore, this study makes the following hypothesis:

Hypothesis 2a. Under high level of involvement, advertising effectiveness of rational appeals perform better than those of emotional appeals.

Hypothesis 2b. Under low level of involvement, advertising effectiveness of emotional appeals perform better than those of rational appeals.

When the product is important and much related makes consumers aggressively to acquire and evaluated product information following the central path. On the contrary, consumers with low involvement are not willing to take much time to do so and they only follow the peripheral path such as brand name, spokesperson, information sources, profession and popularity (Flynn and Goldsmith, 1993). Consumer in different purchasing situations for different products will show different levels of involvement (Warrington and Anamaria, 2000). Therefore, this study makes the following hypothesis:

Hypothesis 3. With higher degree of involvement higher rational products will have the better preference on advertising effectiveness.

Research Design

Measures

Advertising appeals are divided into rational and emotional appeals. By using Semantic Differential Scale, two questionnaires measured whether the subjects were manipulated correctly by the rational and emotional appeals (such as product function versus initiation personal feelings, and utility of product versus feelings of use). Involvement scale with five items of Andrews (1988) was used to measure subjects' involvement of product. Advertising effectiveness was measured by attitudes towards ad (consumers' preferences to the ad) and

attitudes towards product (consumers' preferences to the product), three items of each (Brackett and Carr, 2001) were designed. The higher scores mean that subject had better awareness of ad or product.

Experiment Design

The first experiments were administrated to determine the representative goods. First, sample students sorted 40 products they commonly used into four categories according to their emphasis on ration or emotion in course of purchase (Hong and Lin, 1994; Lin et al., 1994). Then the other sample students singled out 3 products for each category and rated them about usability, functionality, appearance and fashion and my style from 1 to 7. The questions about usability and functionality were from the rational viewpoint and the rest from the emotional viewpoint (Swan and Combs, 1976). The final step was to calculate the distance from the ideal points (1,1), (1,7), (7,1) and (7,7). The shorter the distance the more representative of goods. They came out cell phones (high ration/high emotion), printers (high ration/low emotion), cell phone straps (low ration/high emotion) and dish detergent (low ration/low emotion) in Figure 2. The advertising copies of rational appeals and emotional appeals were also designed as Table 1.

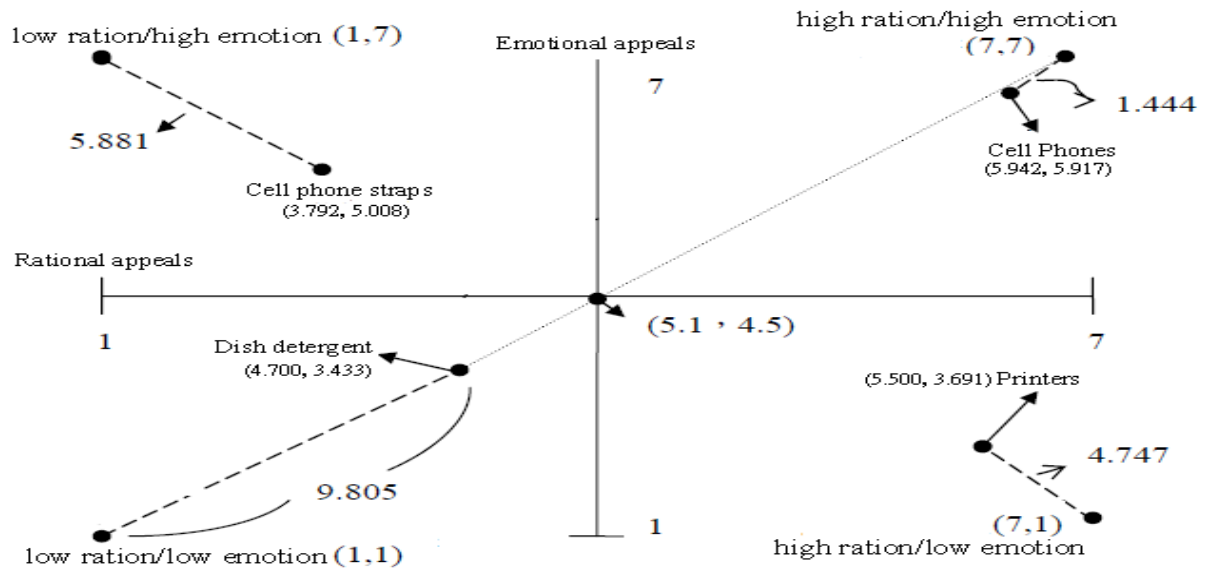


Figure 2, Four representative goods

The study employed homogeneous samples and purposive sampling method. The subjects were students of a university in southern Taiwan. 8 (2 × 4) combinations of situations and 60 questionnaires for each were issued and processed in class. Every subject was assigned to a situation randomly and then receiving a present for finished the questionnaire.

Manipulation Test

The total 393 questionnaires out of 480 were valid (51.7% male, 48.3% female) with the response rates of 81.9%. The values of Cronbach's α for involvement,

attitudes towards ad and attitude towards product are 0.804, 0.669, and 0.826.

Table 1, Advertising copies of rational / emotional appeals

	Rational appeals	Emotional appeals
Cell Phones	Built-in 2 million pixel camera, the main monitor of 260,000 colors, ring tones32 chords. Slider-style, body design with hidden antenna.	Show personal style and charm matching with different colors according to different moods. People can not help but would like to see you more.
Printers	Print Speed: 10ppm B Color 5ppm & W. High Resolution: 2880dpi	Have beautiful memories of fun. Sweet taste of romantic love
Cell phone straps	Fine inlay SWAROVSKI crystal, refraction and good luster 2.8 cm in allows you to freely adjust.	SWAROVSKI crystal installed makes the straps fashionable. Exclusive tailor-made luck representation.
Dish detergent	Filled with natural lemon acid and aloe vera gel. It will not hurt your hands. Coconut oil inside possessed super power.	Fresh fragrance make dish washing a kind of enjoyment. Choose right dish detergent makes the whole family healthy and safe.

Manipulation test (Table 2) showed that there was significant difference between rational appeals and emotional appeals.

Table 2, the manipulation of advertising appeals test

	Cell phones	Printers	Cell phone straps	Dish detergent
appeals	Rational / emotional	Rational / emotional	Rational / emotional	Rational / emotional
t =	-7.066 ***	-7.887 ***	-5.935 ***	-8.310 ***

Results

From Table 3, the fit of advertising appeals and product types had a significant difference on attitudes towards ad ($F = 3.03$) and attitudes towards product ($F = 2.73$). Take printers as example, Table 4 showed that a significant different existed and rational appeals performed much better than emotional appeals ($3.57 > 3.23$ and $3.29 > 2.92$). However, for cell phone straps

in Table 5 showed that rational appeal did not performed much better ($3.83 < 4.03$ and $3.24 < 3.38$).

These evidences showed that H1a was supported but not for H1b.

Table 3, Analysis of advertising effectiveness

Variation Source		F	p
Advertising Appeal * Product Types	Attitudes towards Ad	3.028 *	.029
	Attitudes towards Product	2.730 *	.044
Advertising Appeal * Involvement	Attitudes towards Ad	21.765 ***	.000
	Attitudes towards Product	9.749 **	.002
Involvement * Product Types	Attitudes towards Ad	2.771 *	.041
	Attitudes towards Product	0.634	.593

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

Table 4, Analysis for printer

Printers		Number	Mean	Standard deviation	t	p
Attitudes towards Ad	Rational appeal	51	3.566	0.625	2.520 *	.013
	Emotional appeal	49	3.228	0.716		
Attitudes towards Product	Rational appeal	51	3.294	0.722	2.451 *	.016
	Emotional appeal	49	2.923	0.792		

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

Table 5, Analysis for cell phone strap

Cell phone strap		Number	Mean	Standard deviation	t	p
Attitudes towards Ad	Rational appeal	49	3.830	0.571	-1.628	.107
	Emotional appeal	45	4.025	0.589		
Attitudes towards Product	Rational appeal	49	3.239	0.768	-.936	.352
	Emotional appeal	45	3.379	0.666		

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

Figure 3 and Figure 4 showed that for rational products rational appeals had a better performance on advertising effectiveness than emotional appeals, while for emotional products

there were almost no different between them. From above, we learned that the higher rational products should employ rational appeals for reaching the best advertising effectiveness.

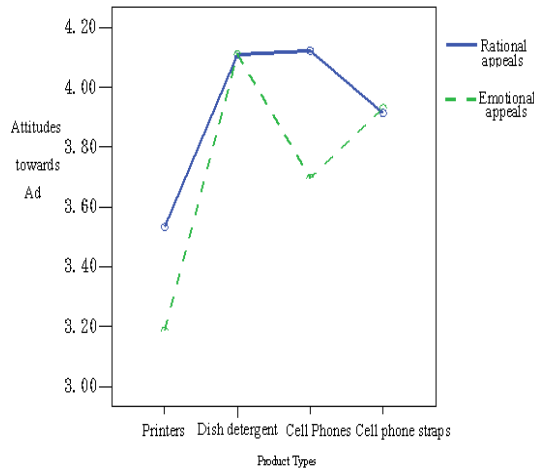


Figure 3, Plot of Attitudes towards Ad (advertising appeal)

From Table 3, the fit of advertising appeals and involvement have a significant influence on attitudes towards ad ($F = 21.77$) and attitude towards product ($F = 9.75$).

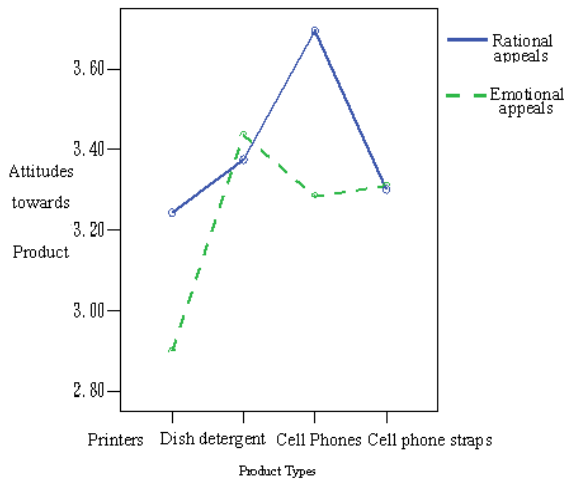


Figure 4, Plot of Attitudes towards Product (advertising appeal)

This result confirmed the truth of ELM (Petty and Cacioppo, 1981, 1986). The person with high involvement would elaborate on the message, and the one with low involvement only looks for a peripheral cue. Besides, from Table 6, Figure 5 and Figure 6 we could conclude that it is the best way to employ rational appeals for customers in high involvement ($4.17 > 3.68$ and $3.76 > 3.37$); while emotional appeals for ones in low involvement ($3.68 < 3.83$ and $3.07 < 3.10$). These evidences showed that H2a and H2b were supported.

Table 6. Analysis for advertising appeals x involvement

	involvement	Rational Appeal			Emotional Appeal		
		Mean	Standard deviation	Number	Mean	Standard deviation	Number
Attitudes towards Ad	Low involvement	3.681	0.715	112	3.831	0.680	85
	High involvement	4.167	0.634	98	3.675	0.680	98
Attitudes towards Product	Low involvement	3.067	0.715	112	3.102	0.667	85
	High involvement	3.761	0.621	98	3.367	0.699	98

From Table 3, the fit of involvement and product type have a significant difference on attitude towards ad ($F = 2.77$) but not for attitude towards product ($F = .63$). The result in Table 7 and Figure 7 showed that with involvement increasing only the means of cell phone strap were decreasing (from 3.957 to 3.847) on attitude towards Ad, while others had an increasing trend. The reason might be that cell phone strap is kind of dispensable product. These evidences showed that H3 was mostly supported.

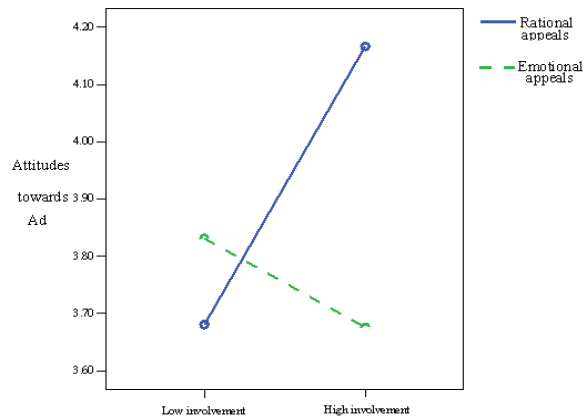


Figure 5, Plot of Attitudes towards Ad (involvement)

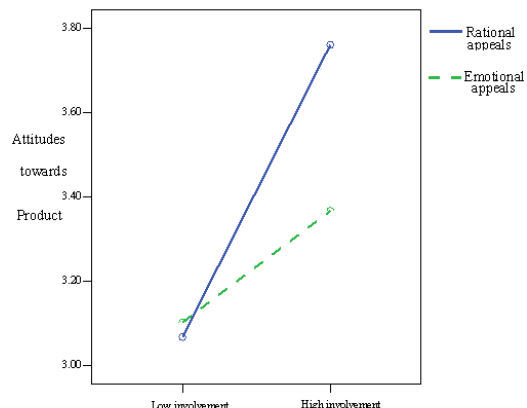


Figure 6, Plot of Attitudes towards Product (involvement)

Summary and Conclusions

This study tried to identify better fit strategies among three variables (advertising appeals, product type and involvement). The results of experiment showed that rational appeals did have a better advertising effectiveness than emotional appeals for rational product. And they were consistent with the findings of Shimp's study (1981). Moreover, according to ELM consumers will process the messages depending on their different level of involvement (Maheswaran et al., 1990). Our study had the same conclusion that rational appeal performed better than emotional appeal when one with high involvement. Lastly, in order to reach the desired advertising effectiveness company should notice high-rational products with high involvement and low-rational products with low involvement. This is consistent with the finding of Liu (1998).

Especially to introduce a new product, advertisers should consider the appropriateness of advertising appeals, the necessity of product, the level of involvement and their fit strategies. In practice consumers with high involvement are attracted by rational appeals because they allow consumers have right and opportunity to process the message. As for the emotional appeals, advertisers should employ to

Table 7. Analysis for involvement x product type

		Low involvement			High involvement		
		Mean	Standard deviation	Number	Mean	Standard deviation	Number
Attitudes towards Ad	Printers	3.252	0.669	53	3.568	0.680	47
	Dish detergent	3.971	0.658	66	4.357	0.527	37
	Cell Phones	3.549	0.599	14	3.953	0.670	83
	Cell phone straps	3.957	0.572	65	3.847	0.616	29
Attitudes towards Product	Printers	2.841	0.670	53	3.419	0.749	47
	Dish detergent	3.174	0.615	66	3.798	0.558	37
	Cell Phones	3.197	0.566	14	3.521	0.730	83
	Cell phone straps	3.165	0.747	65	3.622	0.546	29

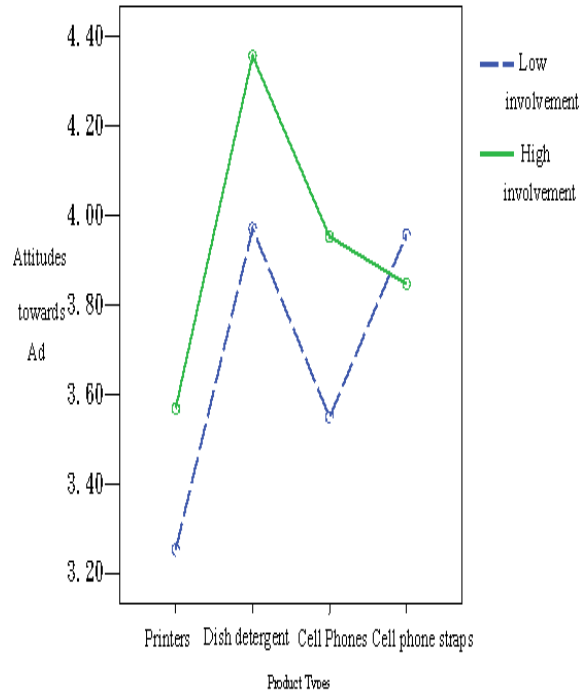


Figure 7, Plot of Attitudes towards Ad (product type)

stimulate and attracted those who are passive and in low involvement. Some suggestions for future research are: (1) to do survey for different population (such as target customers), and (2) to use different advertising medium (such as internet, TV or magazines). The first limitation of this study is the time. Because only twenty minutes for subjects to experience and complete the questionnaires, some reactions do not function in this short time. The second limitation is that the possible factors need to consider. The last one is that by manipulating advertising copies to judge the difference between rational appeal and emotional appeal, the skill of words expression might affect the advertising effectiveness.

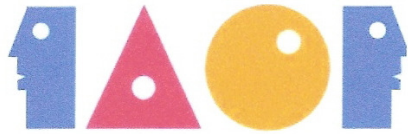
References

- Andrews, JC (1988). Motivation, Ability and Opportunity to Process Information: Conceptual and Experiment Manipulation Issues. *Advances in Consumer Research*, 15 (2), 219-25.
- Avent, T. and Higgins, ET (2006). How regulatory fit affects value in consumer choices and opinions. *Journal of Marketing Research*, 43, 1-10.
- Brackett, LK and Carr, BN (2001). Cyberspace Advertising vs. Other Media - Consumer vs. Mature Student Attitude. *Journal of Advertising Research*. 23-32
- Brucks, M. (1985). The effect of product class knowledge on information search behavior. *Journal of Consumer Research*, 12 (1), 1-16.
- Bucklin, L. (1976). *Retrospective Comment on Retail Strategy and Classification of Consumer Goods in the Great Writing in Marketing*, HA Thompson, ed, Plymouth, MI: The Commerce Press ,382-388.
- Copeland, MT (1923). The Relation of Consumers' Buying Habits to Marketing Methods. *Harvard Business Review*, 1, 182-289.
- Coulson, JS (1989). *An Investigation of Mood Commercials, Cognitive and Affective Responses to Advertising*, MA: Lexington Books.
- Fishbein, M. and Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an Introduction to theory and research*. Addison Wesley, Reading (MA). *Chiao Da Management Review*, 26 (2),23-154 ◦
- Flynn, LR and Goldsmith, RE (1993). Application of the Personal Involvement Inventory in Marketing. *Psychology and Marketing*, 10, 357-366.
- Holbrook, MB and Howard, JA (1977). Frequently Purchased Nondurable Goods and Services. In Robert Ferber (Ed.), *Selected Aspects of Consumer Behavior*, Washington DC: National Science Foundation, 189-222.

- Hovland, CI and Janis, IL (1959). An overview of persuasibility research. In CI Hovland and IL Janis (Ed.), *Personality and Persuasibility*, New Haven: Yale University Press.
- Jien, YW, Xiao, ZQ, Qiu, YY and Lu, DW (2007). The relationship between the information sources and product types, the credibility of information sources, the involvement of consumers. *Management Review*, 26 (2), 85-106.
- Johar, JS and Sirgy, MJ(1991).Value Expressive Versus Utilitarian Advertising Appeals: When and Why to Use Which Appeal. *Journal of Advertising*, 20(3), 23-33.
- Kamins, MA (1990). An investigation into the “match-up” hypothesis in celebrity advertising: When beauty may be only skin deep. *Journal of Advertising*, 19, 4-13.
- Kotler, P. (1991). *Marketing management: analysis, planning, implementation and control*, 7th ed., New Jersey: Prentice-Hall.
- Kotler, P. (2003). *Marketing Management*, 11th ed., New Jersey: Prentice-Hall.
- Krugman , HE (1965). The impact of television advertising learning without involvement. *Public opinion Quarterly*, 29.
- Laskey, H., Fox, RJ and Crash, MR (1995). The Relationship Between Advertising Message Strategy and Television Commercial. *Journal of Advertising Research*, 31-39.
- Liebermann, Y. and Flint-Goor, A. (1996). Message Strategy by Product-Class Type: A Matching Model. *International Journal of Marketing Research*, 13, 237-249.
- Lin, LH, Hong, SC and Liu, SS (1994) The Relationship Between Product Classification, Innovation Type and Marketing Strategy. *Journal of Management Science*, 13(1), 57-77.
- Lin, LY, and Lin, YM (2005). The effectiveness of willingness from the comparative advertising strategies- the interference effect of product involvement. Taipei University, *Journal of Enterprise Management*, 65, 1-28.

- Lin, LY, and Tu, KM (2006). The advertising influence of the concept of brands and ad appeals- the interference effects of involvement. *Truth Journal of Finance*, 15, 77-108.
- Lin, LY, and Zeng, KX (2008). The comparison between advertising effectiveness of spokesmen and advertising appeals- the interference effects of self monitoring. *Enterprise Management Journal*, 76, 87-128.
- Maheswaran, D. and Meyers-Levy, J. (1990). The influence of message framing and issue involvement. *Journal of Marketing Research*, 27, 361–367.
- Murphy, PE and Enis, BM (1986).Classifying Products Strategically. *Journal of Marketing*. 1(29),18-24.
- Ohanian, R. (1991). The Impact of Celebrity Spokespersons Perceived Image on Consumers' Intention to. *Journal of Advertising Research*, p46-54.
- Peterson, RA and Kerin, RA (1977). The female roles in advertisements: Some experimental evidence, *Journal of Marketing*, (Oct) 59-63.
- Petty, RE and Cacioppo, JT (1981). *Attitude and Persuasion-Classic and Contemporary Approaches*, Dubuque, Iowa: Wm. C. Brown Co.
- Petty, RE and Cacioppo, JT (1986). *Communication and Persuasion-Central and Peripheral Routes to Attitude Change*, Ny: Springer-Verlag.
- Scott, C., Klein, DM, and Bryant, J. (1990). Consumer Response to Humor in Advertising –A series of Field Studies Using Behavioral Observation. *Journal of Consumer Research*, 16(4),498-501.
- Shimp, TA (1981). Attitude Toward the Ad as a Mediator of Consumer Brand Choice. *Journal of Advertising*, 10(2), 9-15.
- Speed, R. and P. Thompson (2000). Determinants of Sports Sponsorship Response. *Journal of Academy of Marketing Science*, 28(2),226-238.

- Swan, J. E. and Combs, L. J. (1976). Product performance and consumer dissatisfaction: a new concept. *Journal of Marketing Research*, 40 (April), 25–33.
- Thorson, E., Chi, A. and Leavitt, C. (1992). Attention, Memory, Attitude, and Conation: A Test of the Advertising Hierarchy. *Advances in Consumer Research*, 1(19), 366-379.
- Wang, J. and Lee, AY (2006). The Role of Regulatory Focus in Preference Construction. *Journal of Marketing Research*, 43(1), 28-38.
- Wang, K., Wang, CG and Fan, ZQ (2006). The impact of ad condition and strategies of online ads advertising environment: advertising changes, effects of advertising appeals and guidance. *Information Management Journal*, 13 (3), 1-28.
- Warrington, TB and Anamaria, NJ (2000). Building Trust to Develop Competitive Advantage in E-Business Relationships. *Competitiveness Review*, 10(2), 160-168.



A STUDY OF THE APPLICATION OF THE KOCH CURVE AND FUZZY THEORY ON THE COMPUTER AIDED DESIGN OF FURNITURE

An-Sheng Lee

Department of Forest Products Science and Furniture Engineering, National Chiayi University

E-mail: Sheng1887@mail.ncyu.edu.tw

Abstract

The study was aimed to investigate the development of the optimized simulation software for 2D furniture design and edge decorative strip design by means of the combination of the Koch Curve in fractal geometry as well as fuzzy theory. Through the computer aided design (CAD) software optimized by the two theories, optimized design for furniture edge decorative strip was developed as the reference for the design practice of product designers. In terms of structure simulation, the optimized simulation of edge decorative strip was established to simulate respectively a table and a chair. The participants in the study actually used the computer aided design (CAD) software for the empirical operation analysis.

The research results are indicated as follows: (1) Koch Curve formulas were employed to generate aesthetic 2D design elements. In addition, through fuzzy theory, the viewpoints of the participants were integrated to create furniture design meeting the needs of consumers. (2) According to the experiment of the participants in the study, it was found that after fuzzy computation, the Koch Curve levels of the simulated 2D pattern were more smooth, which was obviously different from the original acute 2D pattern. (3) Through the logic computation and simulation of the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design in the study, the viewpoints of the participants were blended into furniture design to increase the compatibility between furniture and the needs of consumers. (4) New design elements should be created and integrated with furniture design. Moreover, computer aided design (CAD) should be employed to simulate furniture design meeting the needs of consumers in order to advance furniture aesthetics. (5) Consumer-oriented computer aided design (CAD) platform may be established to increase design efficiency.

Keywords: Fractal Geometry, Fuzzy Theory, Furniture Edge Decorative Strip Design, Computer Aided Design (CAD)

Research Background and Motive

In the currently innovative era, product designers need to design products from innovative perspectives to achieve innovative product design. Hsu (2004) argued that computer aided design (CAD) had gradually become reliable and efficient in innovative design, and it was also a necessary skill that industrial designers should possess. In addition, Elsas & Vergeest (1998) addressed the advantages of introducing computer aided design (CAD) in the early stage of design. Moreover, Wu (2004) profoundly investigated the application of computer aided design (CAD) to hill-climbing bike design. It is thus found that computer aided design (CAD) is critical in product design.

In the application of fractal geometry to visual design, Chang & Lin (2000) addressed the application direction of fractals in visual design. In light of the perspective of experience design, Huang (2006) integrated design with fractals into systematic modules to bring up relevant research. Furthermore, Chang & Lai (2001) mentioned the application of fractal design technology and technique education. However, there are only few studies about the integration of fractal geometry and fuzzy theory applied to furniture design.

In this paper, fractal geometry and fuzzy theory were integrated. The diversity of the 2D fractal patterns generated by the Koch Curve, in which all the curves were jointed by aesthetic lines, was combined with fuzzy theory to discover the optimized 2D edge decorative strip design

in order for designers to apply the optimization to edge decorative strips. Scientific computation was also employed to calculate the logic value $0 \rightarrow 1$ deduction of fuzzy theory as the reference for furniture designers, increase design efficiency, and advance the value and aesthetics of furniture.

Research Purposes

Confronting globalization, enterprises value product design to improve the competitiveness. Furniture designers should employ innovative perspectives to develop product design to achieve the production differentiation of furniture and create product value. Hence, in the study, the Koch Curve in fractal geometry was integrated with fuzzy theory to discover the optimized 2D design and edge decorative strip design of furniture so as to increase the overall value of products. The major purposes of the study are indicated as follows:

1. Combining the Koch Curve in fractal geometry with fuzzy theory to develop the computer aided design (CAD) simulation software for edge decorative strips,
2. Applying the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design software used by the participants to simulation.
3. Developing optimized edge decorative strip design as the reference for the design practice of product designers.
4. Establishing the simulation platform of the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design and constructing the optimized edge decorative strip design

by simulating a table.

5. Establishing the simulation platform of the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design and constructing the optimized edge decorative strip design by simulating a chair.

Literature Review

Fractal Geometry

Fractals are evolved from iterated functions in mathematics, in which the initial design of fractal images are generated by the introduction of program computation. In 1904, Helge von Koch, a Swedish mathematician, introduced his continuous curves. Since the fragments of the curves look like the flakes of snow, the curves are also called Snowflake Curve. The Koch Curve brought up by von Koch is of typical fractal image with diversity (Mandelbrot, 1983), and it is studied and discussed most frequently.

Originally a perfectly straight line, the Koch Curve is divided into three segments. An equilateral triangle is employed to replace the middle segment. When the procedure is repeated continuously, a straight line becomes a continuous curve. When the curve is repeated unceasingly, it indicates that the length is infinite. The image obtained eventually is namely the Koch Snowflake.

Mathematicians found that the most suitable description for the dimensions possessed by the Sierpinski gasket was that $\text{dimensions} = \log 3 / \log 2 = 1.585$. Similarly, if the generators of the Koch Curve are used to replace lines repeatedly, the Koch Curve will be established, as indicated in the following figure. The fractal dimension of the Koch Curve is $\log 4 / \log 3 = 1.262$.

Therefore, the method of generating the Koch Curve is described as follows:

Step 1: Draw a line (suppose that the length of the line is $L=1$).

Step 2: Divide the line segment into three segments of equal length. Draw an equilateral triangle that has the middle segment as its base. Remove the line segment that is the base of the triangle (now, $L=(4/3)1$).

Step 3: Each line segment of the curve repeats Step 1 (now, $L=(4/3)2$).

Step 4: Repeat Step 2 (now, $L=(4/3)3$).

The following steps are namely repeating the iteration (now, $L=(4/3)n$)

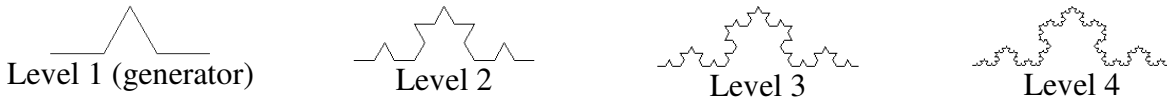


Figure 1. The Four Processes Creating the Koch Snowflake

Note. Adapted from Mandelbrot, B. B., the Fractal Geometry of Nature

Fractal geometry is a new geometric theory, and the applications are extensive. It is especially for explaining the natural phenomena which could not be explained by Euclidean geometry in the past. The real world consists of complicated phenomena, and traditional Euclidean geometry can not satisfy the needs of people to describe the real world anymore. Thus, fractal geometry emerging in recent two decades gradually becomes a popular tool for exploration.

Junyong & Hideki (1998) also brought up another method to creating fractal geometric patterns. That is, through fractal parameters, a computer iteration algorithm was employed to generate fractal geometric patterns. Chiang (2004) classified the generating method of fractal geometry into respectively three methods: (1) The fractal concepts of mathematic rules are based on. (2) Currently available fractal software and computer aided software are used to create fractal images. (3) Based on fractal formulas, computer programs are established, and computer iteration algorithms are employed to create fractal images.

In recent years, fractal geometry is a newly emerging mathematic branch, and it is crucial in the chaotic dynamical system. In the study, the most simple Koch Curve and fuzzy theory were expected to be applied to furniture design in order for people to understand and appreciate the aesthetics of fractal as well as stimulate the interest in learning product design.

Regarding domestic and international literature on fractal art, Chang (2001) and Hsieh (1999) investigated the enlightenment of fractal art in design education; Chang (1996), Chang (1994), Liao (2001), and Wu (2003) explored fractal principles and concepts; Hsieh (1998) studied fractal algorithms. Relevant research displays that fractal geometry is indeed of applied value in design and art. Consequently, the Koch Curve in fractal geometry was applied in the study to develop furniture design.

Fuzzy theory

Many problems exist in the real world, which is full of uncertainty and imprecision. Zadeh (1965), University of California, Berkeley, USA, proposed fuzzy theory. The fuzzy set theory by Zadeh quantifies fuzzy concepts, and it aims to cope with some things which are of fuzzy characteristics. When actual problems are dealt with, the “either this or that” absolute membership of Crisp sets is expanded. The membership of elements toward sets is thus expanded to any random value in a single interval (0,1), and the fuzzy properties of uncertain problems are further quantified. Fundamentally, fuzzy theory was established to cope with fuzzy concepts. It is actually the collective name of fuzzy set, fuzzy relation, fuzzy logic, fuzzy control, fuzzy measure, etc. (Kosko,1994 ; Lin & Peng,1994; Pedrycz,1983).

In fuzzy theory, the functions with values located in the interval of [0,1] can be classified into membership functions. In the study, triangular membership functions and Gaussian membership functions, which are common, were applied to optimized computation, described as follows:

Triangular Membership Function

$$\mu_A(x;l,m,n) = \begin{cases} \frac{x-l}{m-l} & l < x \leq m \\ \frac{x-n}{m-n} & m < x \leq n \\ 0 & \text{otherwise} \end{cases}$$

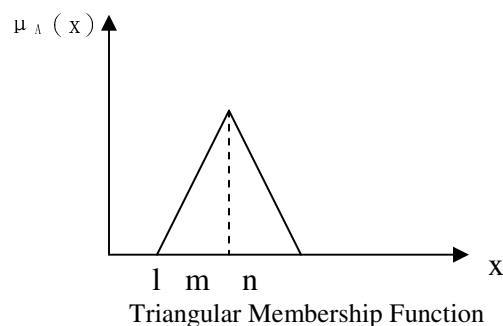


Figure 2 The Coordinate Diagram of Triangular Membership Function

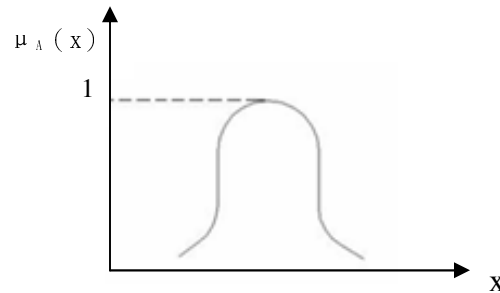
Note. Adapted from Kosko, B.,1994. Fuzzy thinking: The new science of fuzzy logic

Gaussian Membership Function

Gaussian Membership Functions are illustrated in the following figure.

in which, $\mu_A(x; m, \sigma) = \exp[-(x - m)^2 / \sigma^2]$ n of the bell,

namely the standard deviation.



Gaussian Membership Function

Figure 3 The Coordinate Diagram of Gaussian Membership Function

Note. Adapted from Kosko, B.,1994. Fuzzy thinking: The new science of fuzzy logic

For literature relevant to the applications of fuzzy theory to design, Ou (2000) employed fuzzy theory to investigate the applications of spatial color images and computer aided design concepts to increase efficiency. It was mentioned in the study that a great deal of research used fuzzy theory to analyze the color design of products. In addition, through fuzzy theory, Chang (1994) studied the image design of interior monohue base colors. Taking residential living rooms as the example, Chang (2003) profoundly investigated the aesthetic factors and reactions of interior environments. It can be hence found that fuzzy theory is extensively applied to research related to product design. Fuzzy theory was thus applied to furniture design in this study.

To summarize the aforementioned literature, the Koch Curve in fractal geometry and fuzzy theory were integrated in the study to develop the optimized software for the 2D and edge decorative strip design of furniture in order to be adopted in the furniture design and research.

Research Methodology

Research Framework

The study was aimed to investigate the application of the Koch Curve in fractal geometry and fuzzy theory to the 2D and 3D design of furniture. The research framework is illustrated in Figure 4.

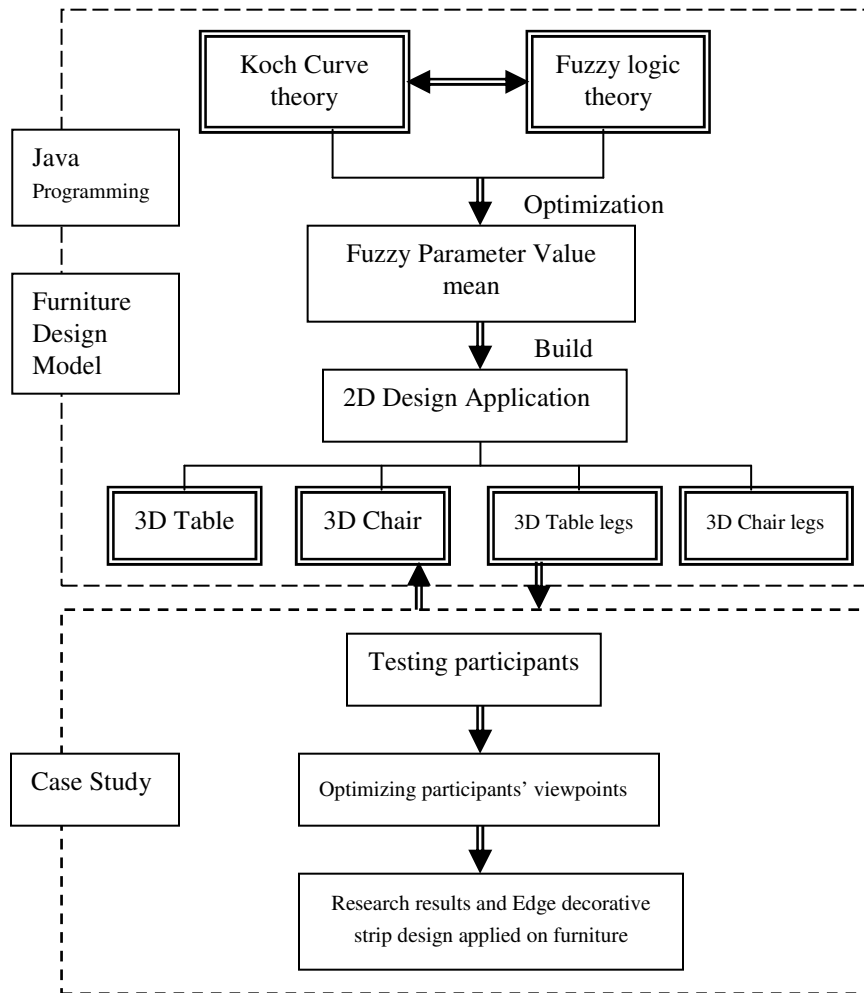


Figure 4 The Research Framework of the Study

Research Design

In the study, the Koch Curve in fractal geometry and fuzzy theory were adopted as the fundamental theoretical framework, and Java was also employed to establish the computer program for simulating edge decorative strip design. Furthermore, based the viewpoints of the participants, the simulation platform was actually operated to obtain the optimized samples of edge decorative strip design. The participants came from National Chiayi University in Taiwan, including 67 males and 66 females. Data and relevant algorithms were constructed to establish an optimized program for simulating furniture edge decorative strip design. 3D table and table legs as well as 3D chair and chair legs were simulated to test the 133 participants in order to establish the actual example of a simulation framework.

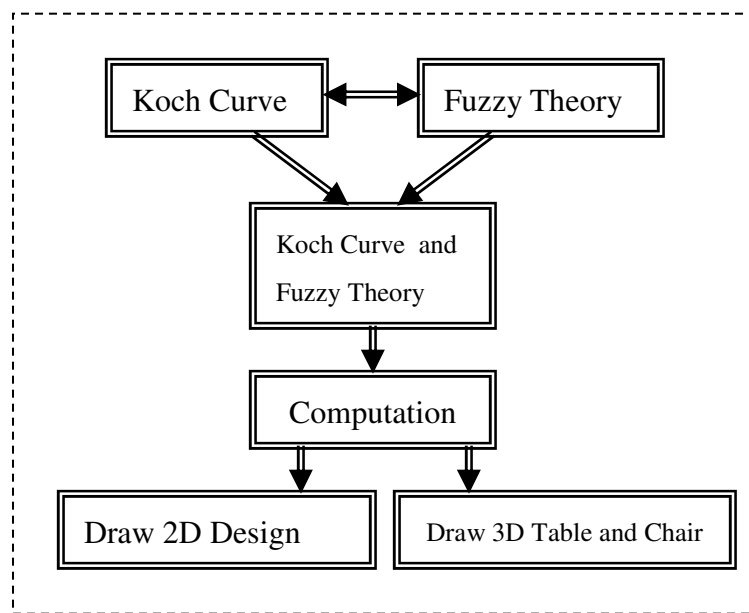


Figure 5 The Logic Computation Model of the Koch Curve & Fuzzy Theory Aided Furniture Computer Design

In the study, Java was applied, and fractal geometry and fuzzy theory were employed as the fundamental theoretical framework. The logic computation model is illustrated in Figure 5. The steps of the logic computation of the model of the Koch Curve & fuzzy theory aided furniture computer design program simulating edge decorative strip design (as shown in Figure 6) are described as follows:

Step 1: Koch Curve Algorithm Java Program

```
// Koch Curve  $L = (4/3)^n$ 
//set level, leng, tute graphics
public void drawKoch(int n, double leng, xTurtle t) {
if (n == 0) {
    t.moveX(leng, 1);
} else {
    drawKoch(n - 1, leng, t);
    t.turn(60);
    drawKoch(n - 1, leng, t);
    t.turn(-120);
    drawKoch(n - 1, leng, t);
    t.turn(60);
    drawKoch(n - 1, leng, t);
}
}
```

Step 2 : Fuzzy Java Program

```
public void drawKochFuzzy3D(int level, double leng, double fuzzy) {
if (level == 0) {
    T3.moveXPers(leng, 1);
} else {
    drawKochFuzzy3D(level - 1, leng, fuzzy);
    T3.turnZ(fuzzy * 100);
    drawKochFuzzy3D(level - 1, leng, fuzzy);
    double x = fuzzy * 100;
    for (double i = (fuzzy * 200); i > 0; i--) {
        if (i / 2 == x) {
            sp3.put(k++, T3.getLP3());
        }
    }
}
```



```

    T3.moveXPers(fuzzy / getNSize(), 1);//0.1
    T3.turnZ(-1);
}
drawKochFuzzy3D(level - 1, leng, fuzzy);
T3.turnZ(fuzzy * 100);
drawKochFuzzy3D(level - 1, leng, fuzzy);
}
}

```

Step 3 : Koch Curve + Fuzzy Java Program

// Koch Curve + Fuzzy $L = \left(\frac{4}{3} * fuzzy\right)^n$

//Set level , leng , turtle , fuzzy

```

public void drawFuzzyKoch(int n, double leng, xTurtle t, double fuzzy) {
    if (n == 0) {
        t.moveX(leng, 1);
        sp.put(k++, new SavePoint(t.getLP().x, t.getLP().y));
    } else {
        drawFuzzyKoch(n - 1, leng, t, fuzzy);
        t.turn(60);
        drawFuzzyKoch(n - 1, leng * fuzzy, t, fuzzy);
        for (int i = 0; i < 60; i++) {
            t.moveX(1 - fuzzy, 1);
            t.turn(-1);
        }
        sp.put(k++, new SavePoint(t.getLP().x, t.getLP().y));
        for (int i = 60; i > 0; i--) {
            t.moveX(1 - fuzzy, 1);
            t.turn(-1);
        }
        drawFuzzyKoch(n - 1, leng * fuzzy, t, fuzzy);
        t.turn(60);
        drawFuzzyKoch(n - 1, leng, t, fuzzy);
    }
}

```

Regarding the simulation platform (as shown in Figure 6 & Figure 7) written by Java in the study, the steps of the computation formulas resulted from the data after the participants accomplished the experimental test are indicated as follows:

Step 1: The computation formula for Koch Curve in the study, $L = (4/3)^n$,

$$S_n = 3, \quad S_{n+1} = \frac{4}{3} S_n, \quad S_n = 3 \left(\frac{4}{3}\right)^{n-1}, \quad \lim_{n \rightarrow \infty} S_n = \infty$$

Step 2: The logic computation formulas for Fuzzy

$$\mu_A(x) = e^{-\frac{(x-u)^2}{\delta^2}}$$

Step3: Koch Curve + Fuzzy $L = \left(\frac{4}{3} * \text{fuzzy}\right)^n$

$$S_n = 3, \quad S_{n+1} = \left(\frac{4}{3} * \text{fuzzy}\right) S_n, \quad S_n = 3 \left(\frac{4}{3}\right)^{n-1} * \text{fuzzy}, \quad \lim_{n \rightarrow \infty} S_n * \text{fuzzy} = \infty$$

Case Study

In the study, the 2D fractal elements generated by the Koch Curve in fractal geometry were employed, and, after the logic computation of fuzzy theory, fuzzy-optimized fillets were resulted from the design elements by the Koch Curve and applied to computer aided design (CAD). The operation steps of the simulation platform are illustrated in Figure 6. Figure 7 illustrates the actual operation example applied to 2D furniture design when the value of the Koch Curve Level was 2, and the optimized value of Fuzzy was .80 in the operation by the participants.

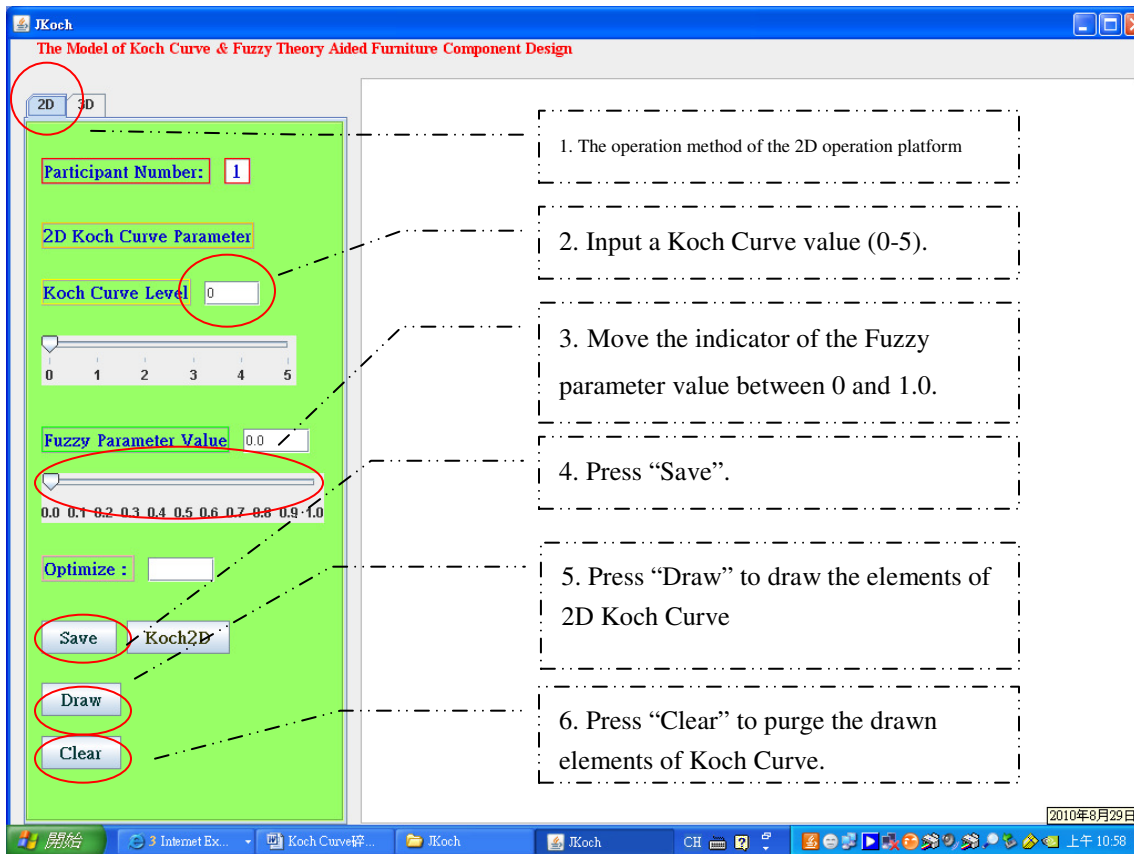


Figure 6. The Interface of the 2D Simulation Platform - the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design

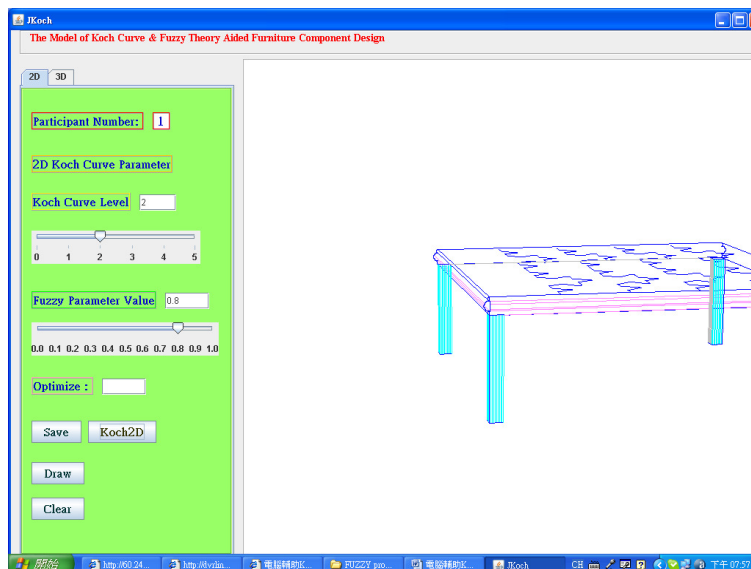


Figure 7. The Koch Curve Level Value of 2 and the Optimized Fuzzy Value of .80, from the Operation of the Participants, were Applied to 2D Furniture Design.

The steps to operate the simulation platform to 3-dimensionally make the 2D design elements, which were resulted from the Koch Curve values through the optimized computation of fuzzy theory, into edge decorative strips are indicated in Figure 8. The elements were further applied to the edge decorative strips around the tabletop and the table legs in order to enrich the design of tables and chairs, such as Figure 9 - 3D Table Simulation Design, Figure 10 - 3D Chair Simulation Design, Figure 11 - 3D Table Leg Simulation Design, and Figure 12 - 3D Chair Leg Simulation Design.

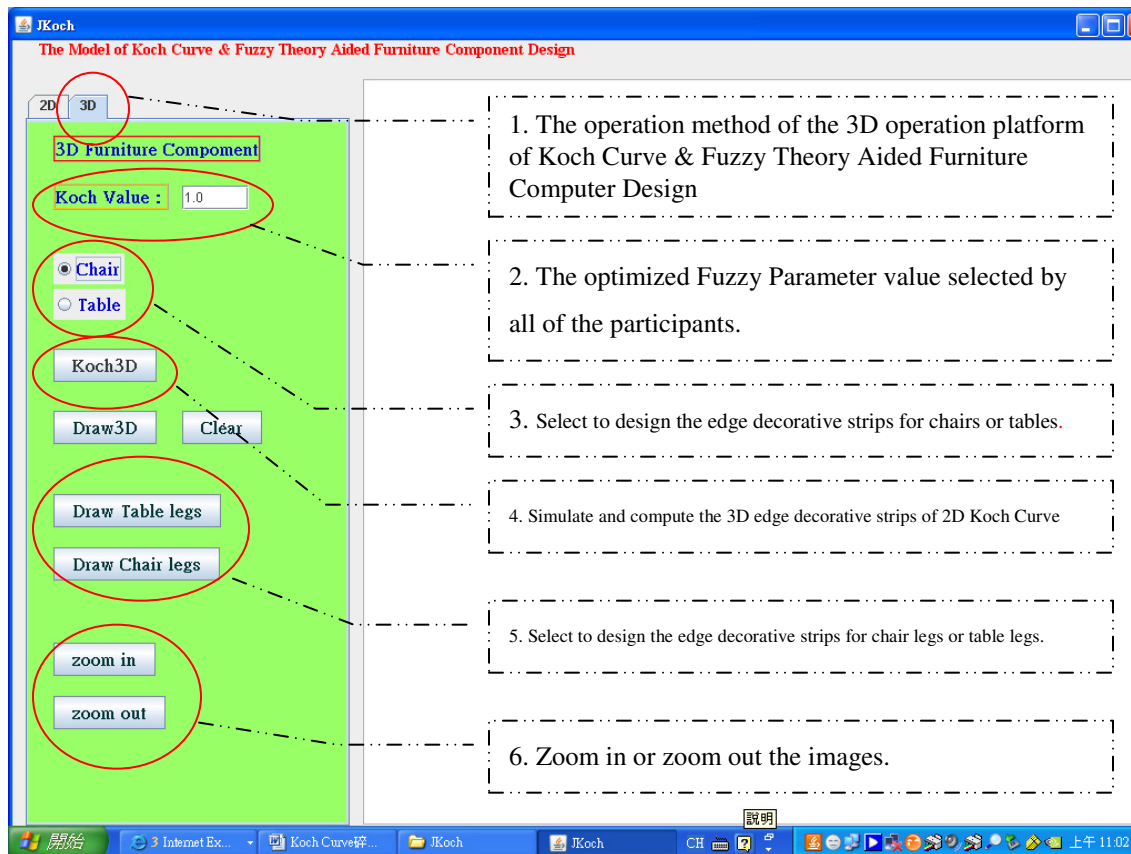


Figure 8. The Interface of the 3D Simulation Platform - the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design

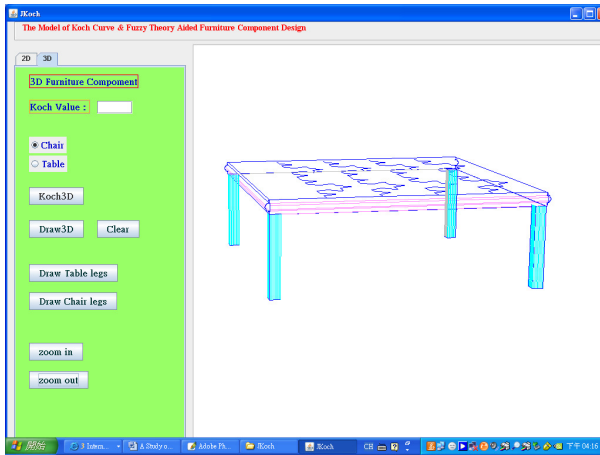


Figure 9. 3D Table Simulation

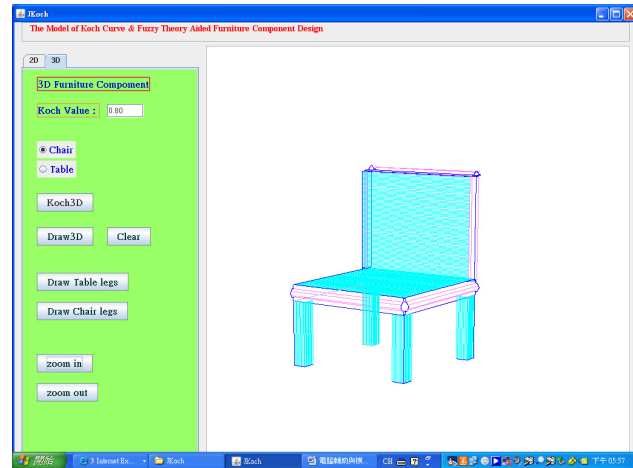


Figure 10. 3D Chair Simulation

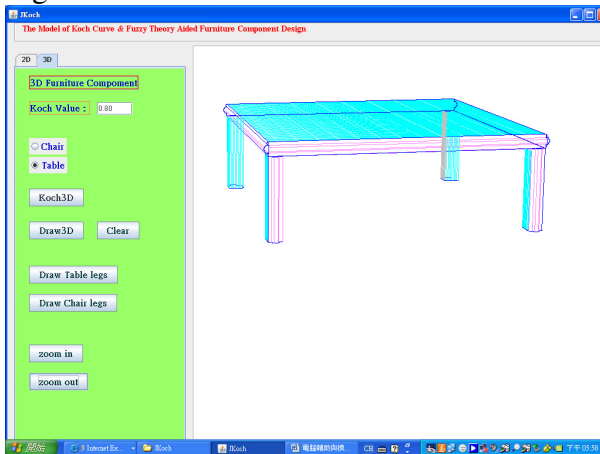


Figure 11. 3D Table Leg Simulation

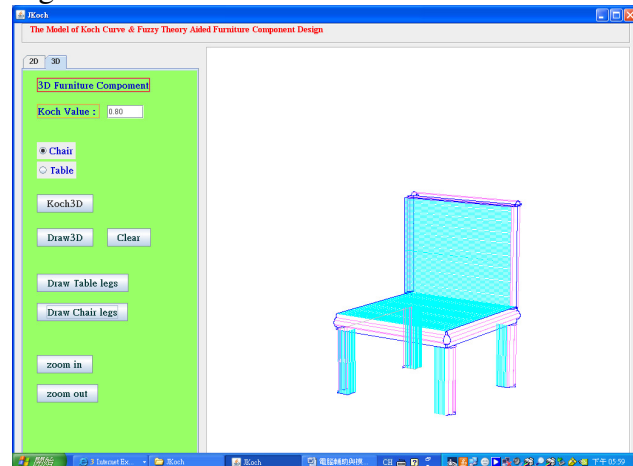


Figure 12. 3D Chair Leg Simulation

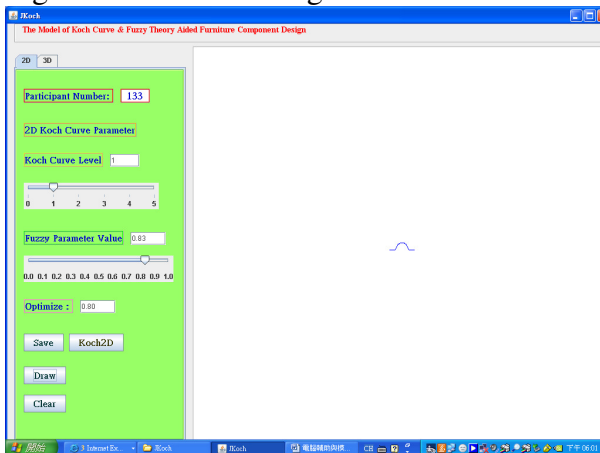


Figure 13. The Pattern Generated by the Fuzzy Parameter Value Decided by the 133 Participants in Koch Curve 1

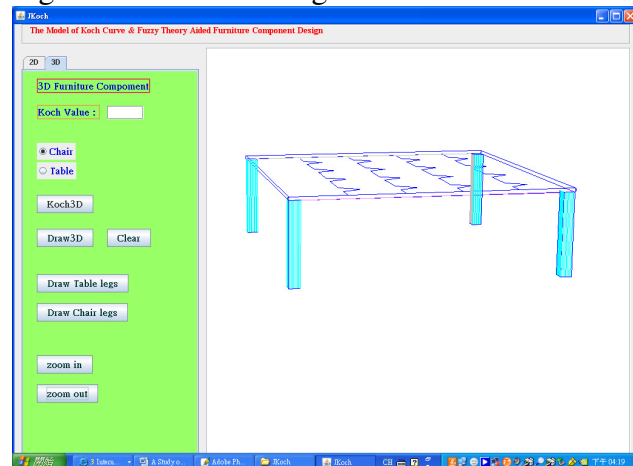


Figure 14. The Koch Curve Level Applied to 2D Table Surface Design

Koch Curve formulas were employed to create aesthetic 2D design elements. Moreover, through fuzzy theory, the viewpoints of 133 participants were integrated to decide the patterns generated by Fuzzy Parameter values in order to establish furniture design meeting the needs of customers (Figure 13 and 14). Figure 15 illustrates the edge decorative strip design of chair backrest simulated when the value of Koch Curve Level was 1. Figure 16 and 17 display the edge decorative strip design of chair leg and table top simulated when the value of Koch Curve Level was 1.

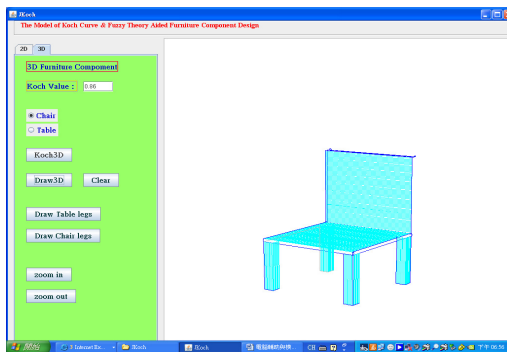


Figure 15. The Edge Decorative Strip Design of Chair Backrest Simulated When the Koch Curve Level Value was 1.

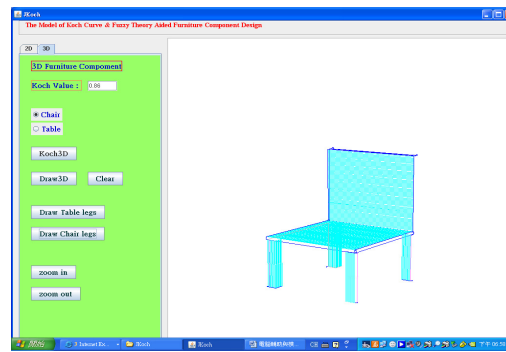


Figure 16. The Edge Decorative Strip Design of Chair Legs Simulated When the Koch Curve Level Value was 1.

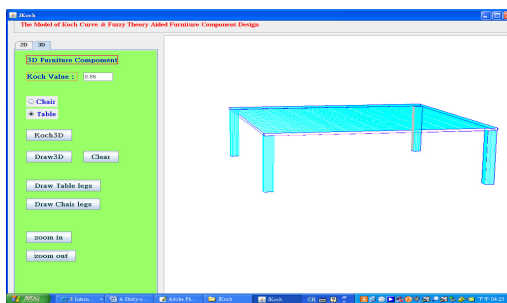


Figure 17. The Edge Decorative Strip Design of Table Top Simulated When the Koch Curve Level Value was 1.

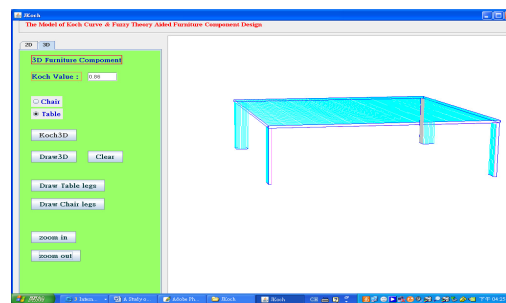


Figure 18. The Edge Decorative Strip Design of Table Top and Table Legs Simulated When the Koch Curve Level Value was 1, and the Koch Value was .86.

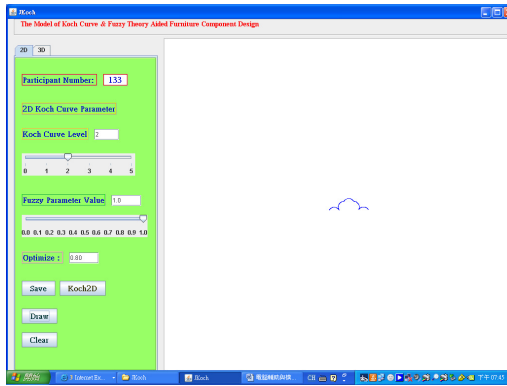


Figure 19. The 2D Pattern Simulated When the Koch Curve Level Value was 2, and the Fuzzy Optimize Value was .80.

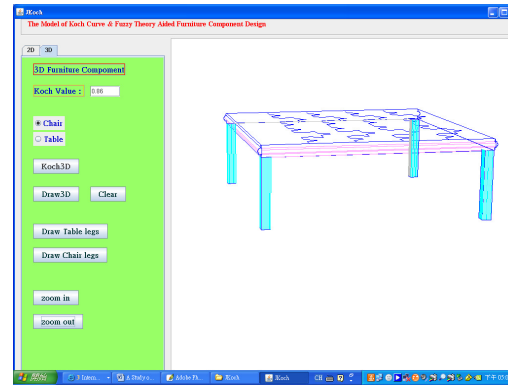


Figure 20. The 2D Table Top Design When the Koch Curve Level Value was 2, and the Fuzzy Optimize Value was .80.

Figure 18 indicates the edge decorative strip design of table top and table leg simulated when the value of Koch Curve Level was 1, and the Koch Value was .86. Figure 19, 20, 21, and 25 illustrate the 2D pattern, the 2D table top design, and the 3D edge decorative strip design, which were simulated when the value of Koch Curve Level was 2, and the value of Fuzzy Optimize was .80. Figure 22 shows the 3D edge decorative strip design applied to the seat and backrest of a chair, and Figure 23 is the zoom-out image. In addition, Figure 24 illustrates the simulation of the edge decorative strip design applied to the backrest, seat, and legs of a chair. Figure 26 indicates the edge decorative strip design for the table top and table legs simulated in Figure 25.

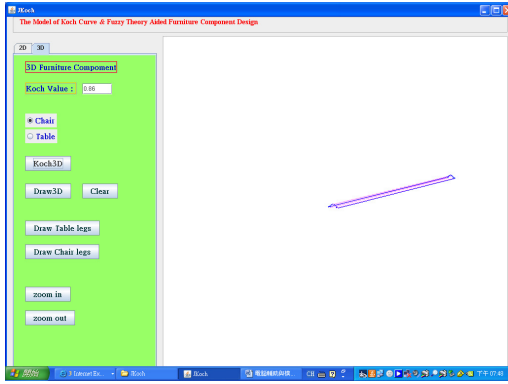


Figure 21. The 3D Edge Decorative Strip Design Simulated When the Koch Curve Level Value was 2, and the Fuzzy Optimize was .80.

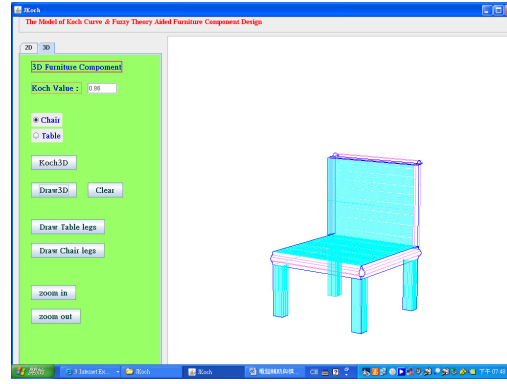


Figure 22. The Simulated 3D Edge Decorative Strip Design Applied to the Seat and Backrest of a Chair.

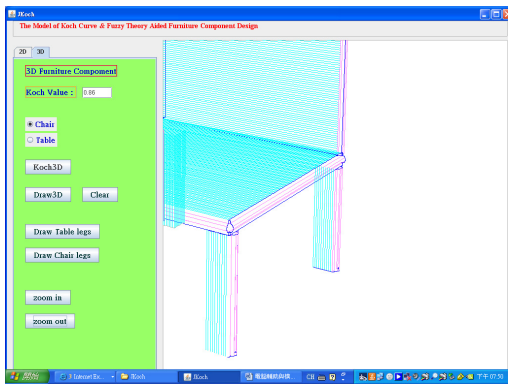


Figure 23. The Zoom-out Image of Figure 22.

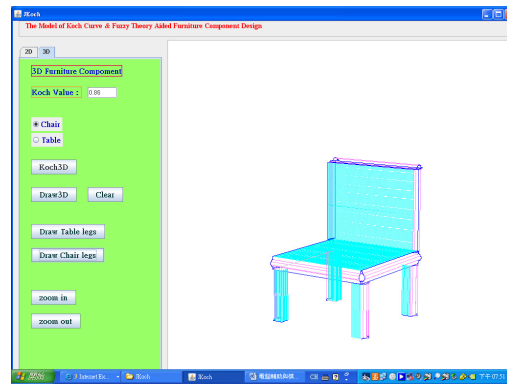


Figure 24. The Simulated Edge Decorative Strip Design Applied to the Backrest, Seat, and Legs of a Chair.

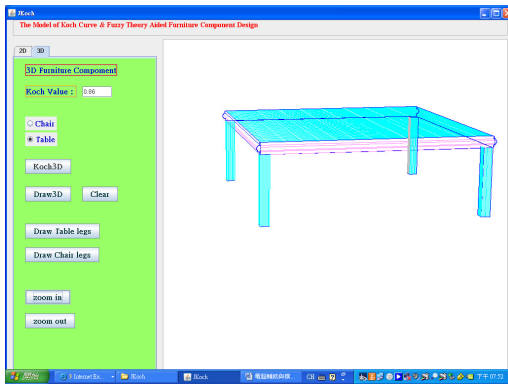


Figure 25. The Edge Decorative Strip Design of Table Top Simulated When the Koch Curve Level Value was 2, and the Fuzzy Optimize Value was .80.

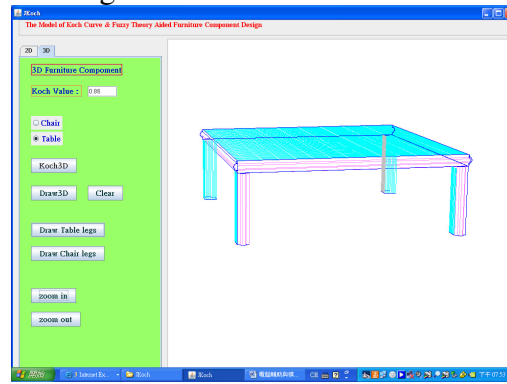


Figure 26. The Edge Decorative Strip Design of the Top and Legs of the Table Simulated in Figure 25.

According to the viewpoints of the 133 participants, the simulation platform in the study was operated to generate the edge decorative strip design of chairs. The Koch Curve Levels ranged between 1 and 5. Koch Curve levels varied between 1 and 5. Koch formulas were used to generate the aesthetic 2D design elements of furniture design in the study. The Fuzzy Parameter Value means distributed from .71, the minimum, to .89, the maximum. The optimized 2D design element patterns generated were indicated in Table 1. The results were shown in Table1, and in the study, Fuzzy parameter mean was found to be very close to each other by the simulation platform according to the viewpoints of the 133 participants.

Table 1. The Edge Decorative Strip Design of Chairs Generated by the Simulation Platform According to the Viewpoints of the 133 Participants in the study






Koch Curve Level	Participant Number	Koch Curve Level Numbers	Fuzzy Parameter Value mean $L = (\frac{L}{5} * fuzzy)^n$	Optimized 2D Element Pattern
Level 1	133	1	.86	
Level 2	133	2	.80	
Level 3	133	3	.71	
Level 4	133	4	.89	

Table 1 (continued)

Koch Curve Level	Participant Number	Koch Curve Level Numbers	Fuzzy Parameter Value mean $L = (\frac{L}{2} * fuzzy)^n$	Optimized 2D Element Pattern
Level 5	133	5	.87	

In light of the viewpoints of the 133 participants, the edge decorative strip design for tables was generated. The Koch Curve levels ranged between 1 and 5. The Fuzzy Parameter Value means distributed from .65, the minimum, to .83, the maximum in Figure 27. The optimized 2D design element patterns generated were indicated in Table 2. The optimized edge decorative strip design for tables and chairs established by the simulation platform in the study was displayed in Table 3.

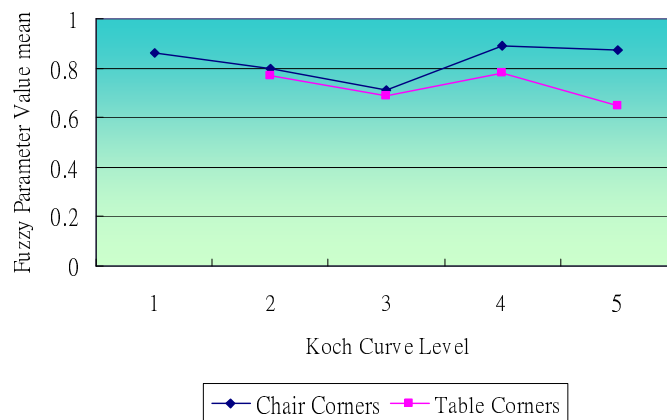


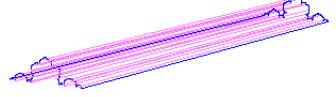
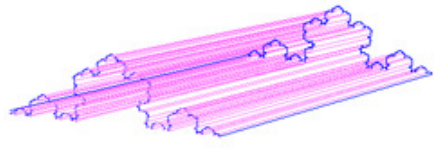
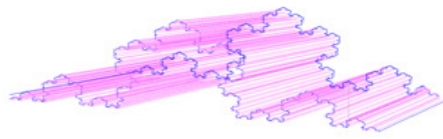


Figure 27 The Edge Decorative Strip Design of Chairs and Tables Generated According to the Viewpoints of the Participants.

Table 2. The Edge Decorative Strip Design of Chairs and Tables Generated According to the Viewpoints of the 133 Participants

Koch Curve level	Participants	Koch Curve Level Numbers	Fuzzy Parameter Value mean $L = (\frac{4}{3} * fuzzy)^n$	Optimized 2D Element Pattern
Level 1	133	1	.83	
Level 2	133	2	.77	
Level 3	133	3	.69	
Level 4	133	4	.78	
Level 5	133	5	.65	

The study results were shown in Table 3, and the fuzzy parameter value mean were the same to that of Table2. The fuzzy parameter value mean generated the optimized 2D element pattern in the simulation platform. The edge decorative strip design of tables and chairs generated by the simulation platform according to the viewpoints of the 133 participants were employed in the table and chair figures of Table 3. In other words, consumers oriented computer

aided design (CAD) platform may be established to increase design efficiency and to fit the needs of consumers.

Table 3. The Edge Decorative Strip Design of Tables and Chairs Generated by the Simulation Platform According to the Viewpoints of the 133 Participants in the study


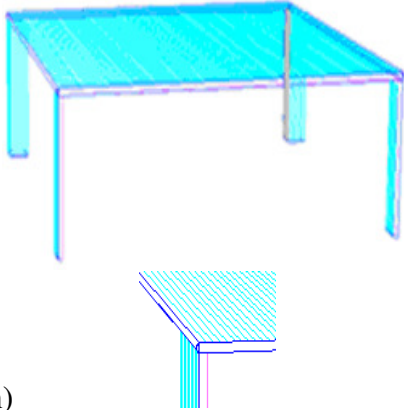
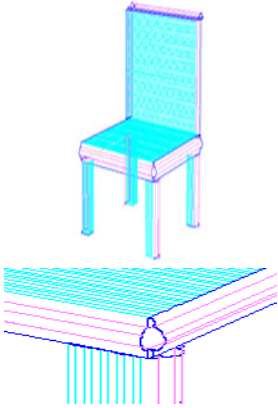
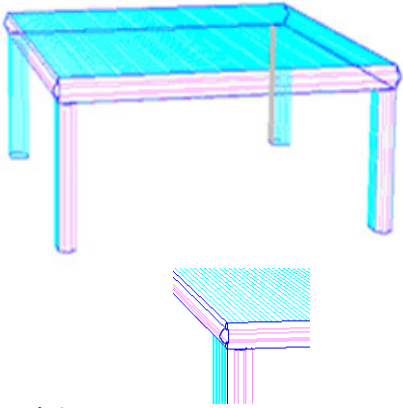
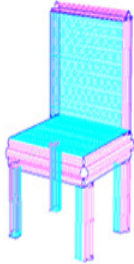
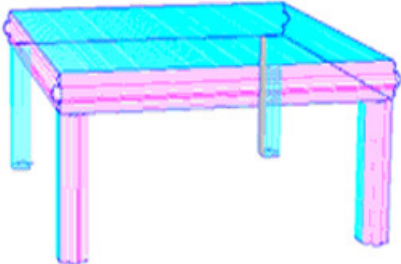
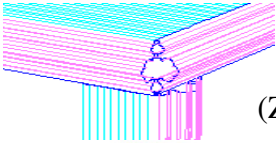
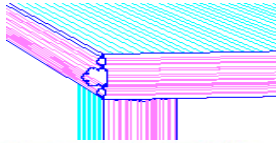

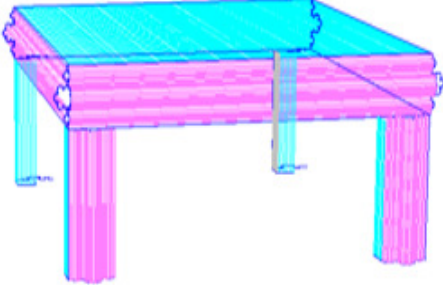
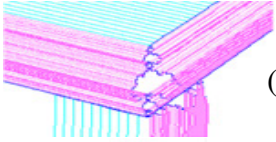
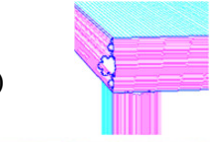
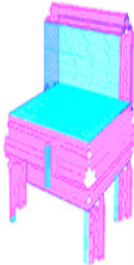
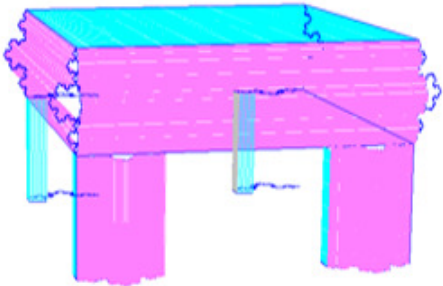
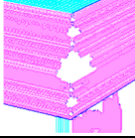

Koch Curve Levels	Fuzzy Parameter Value mean	Table	Chair
1	.83		
2	.77		

Table 3 (continued)

Koch Curve Levels	Fuzzy Parameter Value mean	Table	Chair
3	.69		
			
		(Zoom in)	
4	.78		
			
		(Zoom in)	
5	.65		
			
		(Zoom in)	

Conclusion

In the study, the software of the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design was employed to carry out the 2D and 3D design of furniture. Furthermore, Koch Curve formulas were combined with fuzzy theory to compute the optimized and most aesthetic design selected by the participants to discover 2D design elements, which were then applied to 2D furniture design as well as 3D furniture edge decorative strip design in order to increase the satisfaction and acceptance of consumers on furniture design. The conclusions of the study include:

1. Koch Curve formulas were employed to generate aesthetic 2D design elements. In addition, through fuzzy theory, the viewpoints of the participants were integrated to create furniture design meeting the needs of consumers. The following two specific outcomes were achieved:

(1) The application of the design, which was generated by the combination of Koch Curve computation and fuzzy theory, to 2D furniture design elements enriched 2D furniture design and advanced the aesthetics.

(2) Through the optimized computation of fuzzy theory, Koch Curve values generated 2D elements. The elements were then made 3-dimensionally into edge decorative strips.

They were further applied to the edge decorative strips around the top and legs of a

table in order to enrich the design of tables and chairs and advance the design aesthetics.

2. According to the result of the participant experiment in the study, it was found that after fuzzy computation, the Koch Curve levels of the simulated 2D pattern were more smooth, which was obviously different from the original acute 2D pattern.
3. Through the logic computation and simulation of the Model of Koch Curve & Fuzzy Theory Aided Furniture Computer Design in the study, the viewpoints of the participants were blended into furniture design to increase the compatibility between furniture and the needs of consumers.
4. New design elements should be created and integrated with furniture design. Moreover, computer aided design (CAD) should be employed to simulate furniture design meeting the needs of consumers in order to advance furniture aesthetics.
5. Consumers-oriented computer aided design (CAD) platform may be established to increase design efficiency.
6. The furniture of computer aided design (CAD) in the study may be combined with CAD/CAM as an express manufacturing platform in the future.

References

- Chang, C. H. (1994). *Introduction to Fractals* (pp. 1-4). Taipei: Sung Kang.
- Chang, C. S. (1996). *About Fractals* (pp. 2-7). Taipei: Newton.
- Chang, H. P. (2003). *The Relationship between Aesthetic Factors and Aesthetic Responses in Interior Environments – Using Living Room as an Example*. Master's Dissertation, Department of Interior Design, Chung Yuan Christian University, Chungli.
- Chang, S. J. (1994). *An Investigation of the Image of Interior Monochrome Base Color with Fuzzy Set Theory*. Master's Dissertation, Department of Interior Design, Chung Yuan Christian University, Chungli.
- Chang, T. Y. & Lai, C. T. (2001) *The Application and Investigation of Fractal Geometry in Plane Composition* (pp. 7-16). Symposium conducted at the meeting of 2001 Basic Design & Visual Communication Design.
- Chang, T. Y. & Lin, P. C. (2000). The Application of Fractal Geometry in Visual Design. *Chung Yuan Journal of Design*, 3, 1, pp.55-73.
- Chang, T. Y. (2001). *A Study of Applying of Fractal Geometry Theory on Visual Communication Design and Creation* (pp. 12-23). Master's Dissertation, Department of Commercial Design, Chung Yuan Christian University, Chungli.
- Chiang, W. I. (2004). *Experimental Application of Fractal Geometry's Self-Similarity Features on Visual Identity Design*. Master's Dissertation, Department of Commercial Design, Chung Yuan Christian University.
- Elsas, P. A., & Vergeest, J. S. M. (1998). New functionality for compute aided conceptual design: the displacement feature. *Design Studies*, 19, 81-102.
- Hsieh, P. T. (1998). *The Applications of Randomness in Shaping Natural Fractals* (pp. 367-374). Symposium conducted at the meeting of 1999 Commercial Design Academic and Practice Meeting.

- Hsieh, P. T. (1999). The Drawing and Research of Julia Set. *The Journal Of Commercial Design*, 2, 283-296.
- Hsu, H. W. (2004). *The Effect on Product Formation by Using Computer-Aided Design*. Unpublished Master's dissertation, Department and Graduate School of Industrial Design, Tatung University, Taipei.
- Huang, M. H. (2006). *A Research on Emotional Design Using Fractal for Commercials Popular Visualization Design with the Semantics of the Word "Technology"*. Master's dissertation, Department of Information and Communication, Southern Taiwan University of Technology.
- Junyong, S., & Hideki, M. (1998). *A Study On Form by Fractal Geometry*. 1998 .
- Kosko, B. (1994). *Fuzzy thinking: The new science of fuzzy logic*. London: Flamingo.
- Liao, S. S. (2001). The Fractal Code. *Science Monthly*, pp. 2-7.
- Lin, H. C. & Peng, C. F. (1994). *Oh ! Fuzzy*. Taipei: Third Wave.
- Mandelbrot, B. B. (1983). *The fractal geometry of nature*. New York: W.H. Freeman and Company.
- Ou, H. Y. (2000). *A Study on Application of the Spatial Color Image to Design*. Master's dissertation, Department of Industrial Design, National Cheng Kung University, Tainan.
- Pedrycz, W. (1983). Fuzzy Relational Equations with Generalized Connectives and their Applications. *Journal of Fuzzy Sets and Systems*, 10, 185-201.
- Wu, S. A. (2004). *A Study on Computer Aided Design System —with the Mountain Bike Design as an Example*. Master's dissertation, Department of Industrial Design, Huafan University.
- Wu, W. C. (2003). *Fractal*. <http://alumni.nctu.edu.tw/~sinner/complex/fractals/>
- Zadeh, L. A. (1965). Fuzzy sets. *Journal of Information and Control*, 8, 338-353.