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**The International Journal of Organizational Innovation (IJOI),
The 2014 International Conference on Organizational Innovation, and
The International Association of Organizational Innovation (IAOI).**

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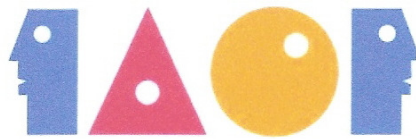
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The International Conference on Organizational Innovation (ICOI): The 2015 International Conference on Organizational Innovation will be held August 4-6, 2015 in Yogyakarta, Indonesia. It will again be hosted by Airlangga University which did such a great job hosting our 2012 Conference in Surabaya, Indonesia. The conference location will be at the Royal Ambarukmo Hotel, Yogyakarta, Indonesia. Plan on joining us there! The conference website is: <http://www.iaoiusa.org/2015icoi/index.html>

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THE VALUE OF CRAFTSMANSHIP IN MANUFACTURING
AND RELATED ORGANIZATIONAL MODELS

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Abstract

Following the first Industrial Revolution, a management of the workforce was necessary in order to satisfy the increasing demand for goods and a large number of unskilled workers were trained as quickly as possible in order to realize simple operations. Organizational models of work were successfully applied together with mechanization and then automation, allowing a reduction of the human workload.

The value of a handcrafted product is often higher than that of a standardized mass-produced one, as an artisan has the ability to manufacture unique and attractive items. The demand for high quality personalised products is nowadays forcing a rethinking of the role of the craftsman, with artisans now operating inside the industrial environment in order to enhance the complexity and the quality of a product. The concept of “slow manufacture” is a key factor in recovering the tradition, culture and vocation of a territory, thus improving the connections between a product, the place where it is manufactured and the skilled workers.

Key Words: Craftsmanship, Mass Production, Labour Management, Slowness.

Introduction

Industry is nowadays one of the pillars of any economic system. For many centuries and leading up to the first Industrial Revolution in the eighteenth century, agriculture was the main human activity and way of sustainment with most people living in the countryside cultivating grain and breeding cattle. The transformations that lifestyle and society have undergone have brought about huge changes in the organization of work, even if the study of management of human resources has only recently become an object of interest and research (Rindos, 1984).

The first forms of work organization were developed in the countryside where farmers generally worked for a landowner, under the direction of foremen. The management of labour was simple; agriculture doesn't require complex organizational structures, workers jointly operated to achieve the common aim of the sowing and the harvest using animals as the source of power to move equipment and devices for cultivation. Together with agriculture, craftwork was the other main human activity developed at the time. Objects of every kind and for any function have long been manufactured in order to hunt, cultivate, cook, decorate etc. During the Middle Ages in Europe workshops of

painters, ceramists, tailors and many other crafts became popular, to satisfy the increasing need for goods mainly coming from kings, nobility, and from an appearing middle class that was arising as a new economical power. Work was organized under the guidance of the master owner of the workshop. Young apprentices were trained in the skills and techniques of their art, to eventually become fine craftsmen able to run their own activities (Figure 1). Craftwork was considered more modest than art and many products by artisans, such as bowls, amphora, ceramic and glass vases, wood statuettes, embroidery, laces, carpets as well as items of applied art such as mosaic, alabaster and carved leather were held in contrast to “great sculpture and painting” considered to be pure arts (Dorfles, 2008).



Figure 1. A “Bottega” of a potter: a graphical reconstruction in the 14th century.

The evolution of technology brought the development of new products and

markets. An interesting example is the silk mill technology that first appeared during the 1500s in Bologna, Italy (Figure 2).

The city flourished thanks to a mechanized production of silk that took advantage of the energy produced by the water canals crisscrossing the city. Historians of the industrial revolution consider the Bolognese silk mill an important example of a proto-industrial factory. The productive process was totally mechanized: workers limited their actions to feeding the machines, knotting the threads when they broke, taking the skeins away from the reels and placing them in their specific nets.



Figure 2. Reconstruction of a Bolognese silk mill in the 1500s.

By the end of the 17th Century, 119 silk mills powered by 353 hydraulic wheels of one or two horsepower, fed by the water

streams, were located inside the walls of Bologna. The Bolognese canals were all covered over in the early 20th Century and the inland waterway port disappeared in that period (Costa, 1998). Nowadays, it is possible to observe the river crossing the town only in a few locations (Figure 3).

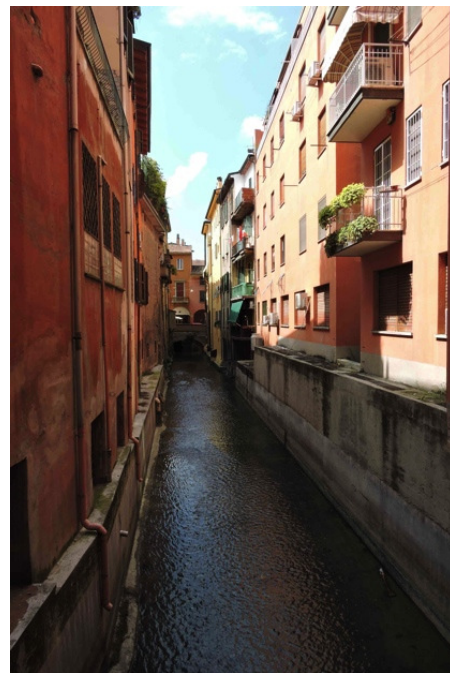


Figure 3. A water stream still visible in Bologna.

The production of silk was for centuries the most important sector in the Bolognese economy. The corporation of the Art of Silk was governing silk production in Bologna (Istituto internazionale di storia economica F. Datini, 2009). Corporations were the first form of category organization and management created in several Italian cities during the Middle Ages in charge of leading different production sectors. In most cities, each kind of activity was often concentrated

in a particular area. Still nowadays in Florence and in other towns there are streets named after the trade that was conducted there (Figure 4).



Figure 4. Streets named after ‘arts corporations’ in Florence.

The biggest change in the organization of work occurred during the first Industrial Revolution in England when the earliest factories were created applying the technological innovations of that time. Machines were beginning to be powered by new sources of energy such as steam produced by the combustion of coal. These newly-formed industries required dramatic changes in the management of work.

Any manufacturing enterprise receives inputs and elaborates them producing outputs. The transformation of the input into output is realized through processes, from

raw materials to finite products, implemented by human resources using machines. Whether to employ machinery was one of the big dilemmas faced by craftsman at the beginning of the modern era. Is the machine an ally or an enemy that substitutes the human hand of the worker? The first appearance of machinery held the promise of improving quality of life but the use of machines caused concern because of the tendency to lead towards mass-production and the potential effects this could have on the “experience of making” (Senneth, 2008).

Since the Industrial Revolution, workers’ duties were mainly the setting up, activating and maintaining of the machines, requiring less and less performance as a craftsman. Human tasks were reduced to a minimum: just the actions necessary for the correct operations of the machinery in order to increase the number of manufactured items and quicken the production.

This new approach was significantly expressed in Taylorism and Fordism. Frederick Taylor proposed to select the ideal worker for each specific task and to instruct him/her in order to achieve the desired performance (Taylor, 1911). The main objective was improving economic efficiency. Taylor theory contributed to the passage from craft to mass-production by the maximum fragmentation of work tasks to minimize skills requirements and job learning time. The use of special purpose

machines to produce huge volumes of standardized products is at the base of Fordism, a production principle born in the U.S.A. at the beginning of the 20th century and particularly popular in the automotive sector. This reorganization of the productive process allowed the reduction of product costs and the increase of profits, which in turn led to a raise in the wages of workers who were then able to buy the products they were helping to produce. Henry Ford's zero complexity approach to automobile production proved to be a breakthrough, with the assembly line and mass production that revolutionized the industry. Since then, many manufacturers have attempted to compete using this model of reducing or eliminating real and perceived complexities spreading the idea of mass production and standard products (Ford, 2005).

Utilising these two approaches, the complexity of tasks is reduced as much as possible and the work force is mainly used to handle the machines reducing the creative capacity and expression of the workers (ElMaraghy W., ElMaraghy H., Tomiyama T., Monostori L, 2012).

After the Second World War, a mechanical engineer at Toyota in Japan, Taichi Ohno, proposed the "*Total Quality*" as a new industrial approach and organizational model (Ohno, 1978). One essential aspect of the Total Quality programme is to substitute the philosophy of hierarchical

responsibility with a spread responsibility in the process of production management. The intention is to transform macro and micro decisions, previously connected to different hierarchical roles and levels, into moments of a continuous process in which roles and levels are interchangeable according to requirements (Maldonado, 1991). Toyotism also focuses on the reduction of the seven wastes ("Muda": Overproduction, Waiting, Transportation and Superfluous Maintenance, Over-processing, Overinventory, Not useful Motion, Defects). Some methodologies and tools, such as "*Just in Time*" and "*Kanban*", have been created to support and implement this model and have spread all over the world. The currently popular concept of "Lean Manufacturing" is a further evolution, enhancing the continuous optimization of manufacturing operations in order to increase manufacturing flexibility and satisfy customers. The management and organization of work forces becomes even more important and workers are required to be active in terms of personal initiative, contributing to the constant improvement of the production through observations and suggestions to increase the competitiveness of the company. Their daily work activity and experience makes them the best problem solvers and inventors of new technical solutions. Communication, team building and enhancement of workers skills are important components of Post-Fordism approaches where the mass standard production has been transformed into a differentiated and

personalized production to satisfy different customer needs. The role of employees has changed from the “*trained gorilla*” of Fordism, who performed the same operation all his life, into a more flexible worker with multiple abilities. Information and Communication Technologies (ICT) have a fundamental importance in the production system and manufacturing operators need to be skilled in ICT in order to contribute to an increase in the productivity and competitiveness of the factory. The worker becomes a kind of ICT-artisan, who is able to manage different processes; to operate different kinds of equipment and machines; to communicate at various levels (Russo, 2012).

The Value of Craftsmanship

Since the Industrial Revolution the reduction of time and costs has been the primary aim of industry. The standardization of products and the elimination of defects have been the most important targets of manufacturing enterprises. To this aim, electronics has joined mechanics and thus production lines have become highly automatized.

In recent times, there has been a return to traditional manufacturing methods and techniques and some entrepreneurs are reevaluating craftwork in their industries to supply innovative products, highly personalized on a small scale (Campana,

Cimatti, 2013). Not only the flexibility of the manufacturing machines, but also the craftsmanship component maintained in the industrial production, can distinguish the product from a standard one fabricated in highly-automatized factories. Furthermore, the artisan skills attribute to the object a uniqueness that can hardly be achieved by machines.

Many elements contribute to the craftsmanship (Figure 5) that can characterize an industrial product:



Figure 5. Elements contributing to craftsmanship.

- Territory, history.
- Cultural Heritage, tradition.
- Making know-how, art professions.
- Hand working, shaping capability.
- Knowledge of materials.
- Innovation, Technology.

Personalization of the product. Territory, history: the wisdom of a population arises and develops in a certain territory, which

becomes itself a fundamental value to be protected, to be discovered and to be considered as precious as gold and oil (Colombo, Cavalli, Lanotte, 2009).



Figure 6. Glass craftsmanship.

Cultural Heritage, tradition: ancient techniques are used through the centuries, maintaining the memory of the first crafts production and the appeal of handmade objects. The glass craftsmanship in the Venetian industrial district (Figure 6) is a clear example of territory vocation and tradition.

Making know-how, art professions: the craftsman is a technician and an artist, both conservative and innovative. Different techniques and knowledge have given rise to a variety of vocations and jobs.

Knowledge of materials: the choice of the right materials to fabricate any product is fundamental not only to make it functional but also for aesthetics, cost and sustainability.

Innovation, technology: along with the maintenance of tradition, new and innovative techniques can be used and integrated with the old ones in order to assist the workers and achieve a functional and commercially effective product.

Personalization of the product: an original and special aspect that distinguishes the item from others, the mass production characterizing the last few decades has been substituted by new flexible manufacturing approaches, allowing the fabrication of non-standardized goods that satisfy the individual needs of the customer.

Organization and Human Resources Management

Nowadays it is possible to define a new craftwork, complementary to industrial production. It uses traditional tools together with modern sophisticated machines, materials used since ancient times, such as wood and straw, and present experimental materials, such as advanced polymers, new textiles, new varnishes and adhesive (Turinnetto, 2008). This new craftwork gives quality to the work of many small to big enterprises that, also counting on scale and dimension, entrust to crafts skills tasks fundamental for their market success (Micelli, 2011). More and more factories around the world, often famous and prestigious brands, are basing their work on this new paradigm that enhances craftsmanship. Different types

of goods are being manufactured in this way: not only traditional ones such as furniture, food, fashion accessories and garments but also cars, motorbikes and advanced technological products. A possible definition of this manner of production is “slow manufacturing”. The reduction of production time is not the main focus. As the entrepreneur Bonotto says: “time is the new luxury”; more attention to detail is given so adding quality and value to the product (Bonotto, 2011).

Increasing the craftsmanship component in the manufacturing production implies changing the human resources management approach that had characterized the origins of modern industry over the whole of the last century. Tasks are not any more fragmented but the object is wholly or mainly manufactured by just a few workers, who are able to give it added value deriving from their skills and abilities. The aim of reducing handwork is substituted by the enhancement and the appreciation of workers skills not only in terms of machine management but also of creative attitude. The employees at all levels are given responsibility and they have knowledge of the different processes required in order to achieve the final product, thus they can better contribute to improvements and innovation. A famous example of the importance of workers awareness is the Ferrari manufacturing plant located in Maranello, Italy, where, in amongst the CNC machineries used to fabricate high

technology components, a Ferrari Formula 1 car is parked as a constant reminder to the workers of the final aim of their efforts.

Within a more craftsmanship production oriented approach, the head of the department is more a coordinator than a chief, collecting all the suggestions coming from the workshop stage and transforming them into concrete actions. Knowledge sharing and communication are important to allow employees to reach the common aim of a quality final product that contributes towards the company’s success.

This approach is well integrated into modern Organization Theory, stating that an organization is a system that has to adapt to the changes and developments in its environment. Modern Organization Theory has its roots in biological and ecological sciences: the human organization is comparable to organic systems in which everything is related to everything else and a change in one element of the system will affect all other relationships inside the system (W. R. Scott, Gerald F. Davis, 2006) (W. R. Scott, 1975) (R. L. Daft, 2012). A specific environment surrounds any organization; its success is strongly correlated to its capacity of adaptation to this environment and to the changes taking place in it. As a logical consequence, different environments require different organizational structures to be effective.

Referring to the industrial manufacturing sector, there is a strong connection between the way an enterprise fabricates its products and the environment where it is located, in particular referring to the craftsmanship aspects. As reported above, territory and history, cultural heritage and tradition are fundamental in developing the artisanal skills, so precious in the manufacturing of any industrial product which does not intend only to be a standardized one. This enhancement of craftsmanship could be wrongly interpreted as a return to past times, but in fact it is an evolution and surpassing of the Computer Integrated Manufacturing system, moving towards the idea of a Human Centred Factory where workers' skills are enhanced. This implies some significant consequences in enterprise organization, coherent with the modern Organization Theory approach.

Conclusion

The organization of work has changed throughout the centuries, starting from the direct management of the field labour forces and the relation between the master and his

apprentices in the workshops of the Middle Ages to the complex organizational charts of present-day companies.

Technological changes and the evolution of the production systems have contributed to the modification of the organization of enterprises. Modern approaches have increased the awareness and participation of workers, making firms more competitive, improving the wealth and well being of its employees.

Craftsmanship has been recently re-valued and some enterprises use a mixed industrial-craft approach, enhancing the traditional and cultural aspects of the product to manufacture unique and attractive goods for the present sophisticated market. In this kind of production, workers have the possibility to express their skills taking care of different phases of the fabrication of the product and expressing their creativity. This work method not only creates a high quality product level but also allows workers to have a more interesting and satisfying job and to improve their quality of life.

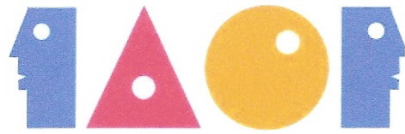
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OPEN INNOVATION'S STRATEGIC BUSINESS VALUE (SBV)
CONTEXT: ARM MODEL CONCEPTUALISATION

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Abstract

The Open Innovation (OI) Paradigm is relatively new in the Industry. Yet, its positive effects can be felt even stronger in terms of promoting the conceptualization of strategic business value (SBV) as a goal and as an enabling context for innovation. The paper contrasts core elements in the closed and open innovation paradigms. The discussion about OI highlights absorptive (A), relational (R) and multiplicative (M) capabilities that companies must coordinate with innovation practices within SBV contexts. The discussion provides a definition of SBV context and conceptualisation of an Open Innovation ARM Model. The ARM capabilities are central to a network view of SBV and function as conduits and as a collective platform for innovation deployments to support inter-organisational activities. Future research possibilities are suggested.

Key Words - Close Innovation (CI) Paradigm, Open Innovation (OI) Paradigm, Absorptive (A) Capability, Relational (R) Capability, Multiplicative (M) Capability, Open Innovation's ARM Model, Strategic Business Value (SBV).

Introduction

Open innovation (Chesbrough, 2003, 2003a) has been around for a few years as a concept and as a useful way of doing business. Yet, its strategic potential as a new

paradigm to increase business value capabilities in two or more organisations benefiting from each other's innovative efforts has yet to fully realise its potential. A number of stumbling blocks weaved into the very fabric of a traditional business model

arising from a closed innovation ethos which is still part of the Business community stand in the way of the new paradigm (MacFarland, 2014). But, what exactly is the closed or old innovation paradigm? How does the open innovation (OI) fair in terms of potential to augment strategic business value (SBV) through further focus on and deployment of capabilities?

The quick reply to the first question is that closed innovation (CI) is the old (established, traditional or yesteryear's) innovation paradigm which has animated business practices for a very long time. In many ways, it is this long CI tradition which serves as a stumbling block in fully realising the potential of the OI paradigm. In the best of situations, paradigms serve in a positive way as overarching frameworks for actions, practice and modelling of activities. Unfortunately, an out-of-date paradigm functions as major stumbling block for business action, as seems to be the case with the closed innovation paradigm.

Recent research in Business Value has focused on Big Data and Analytics (IBM Institute for Business Value, 2010). The above and the focus on Information Systems (IS) and customer value are good research venues. However, what the OI paradigm can offer SBV research is a focus on dynamic capabilities and context, both of which were

not included in research efforts in the CI paradigm. In his writings, the father of modern management, Drucker (1980, 1985) commented that new, dynamic tools were needed to explore business management problems. The herein discussion compares features of the CI paradigm to those in the OI paradigm of interest in the paper. Herein, an Open Innovation's ARM Model is deployed to frame discussion about SBV and adaptive (A), relational (R) and multiplicative (M) capabilities.

By using the SBV construct, the paper's intention is to focus attention on internal and external relationships which enable innovation and add value to a company. By mentioning relationships, the intention is to highlight a network-oriented definition of SBV context where strategy, activities and innovation are dynamically constituted by relationships, resources and capabilities benefiting a company. The latter view on SBV is fairly consistent with Giddens (1984) structuration theory where the effects of structures and agents are equally seen as shapers of actions, activities and change "as businesses today operate in an ever more interconnected and globalized world" (KPMG, 2012, Foreword).

Closed Innovation (CI) Paradigm

The discussion below highlights a few core features of the closed innovation paradigm. As in many areas of economic and social life, there is no chronological demarcation point at which one can witness all core features in existence at the same time. But, one can argue that at the turn of the 20th century the prevailing closed innovation paradigm did include at least the below features as these were part of the dominant Business Model at the time.

The below discussion is somewhat brief in its provision of content to critically present CI as the traditional or dominant business model of yesteryear. However, it is important for our purposes to provide a stark presentation about CI to highlight core differences between it and the OI paradigm. The issue of control is mentioned below in some of the CI subsections. Of course, control is important and it is a useful management function.

Additionally, for various reasons, a certain level of keeping information within the boundaries of an organisation would be a good thing to ensure the company receives benefits by being the first to take a particular innovation embedded in a new product to market. However, the CI paradigm seems to rely on control to the expense of an in-flow of useful ideas which could and do trans-

form business operations and yield higher levels of value and dynamic capabilities.

Man of Genius Mode

In a letter to J.B. Yeats, the poet Ezra Pound commented that “a man of genius has a right to any mode of expression” (Quoted in Carpenter, 1988, pt. 2). A similar version of the comment was used by Harvard President James Bryant Conant when he stated that companies should be investing money in employing men of genius and in leaving them alone to do their work (Connant, 2003).

To some extent President Conant was speaking from personal experience as a scientist and a researcher during WWII in the above book written by his granddaughter Jenet. At the time of WWII, President Conant worked as scientist in the Laboratory of Alfred Loomis and part of secret efforts in the Laboratory contributed to preliminary research about the atomic bomb.

In addition to secrecy, innovation is something that apparently requires a genius level intellect, hence the comment from President Conant a few lines above. It is not something that people with normal levels of intelligence could engage in productively. Also, it is matter left to the experts with special training. Other organisational

workers are not intelligent and/or qualified enough to be innovators.

Furthermore, customers and other stakeholders associated with a particular business and its operations would not be considered as sources of innovation in a closed innovation paradigm and its business model. This business model of innovation limits innovation options available to a business as well as neglects such important sources of innovation as customers, suppliers and any other outside source of innovation.

In addition, outside skills, expertise and knowledge are not considered as something the company would need to bring in to aid with innovation activities. Of course, there is nothing wrong with a company hiring the right people with the right skills and knowledge levels to do the required work. The latter actions ensure that the company is able to accomplish its corporate strategy.

However, at the same time, total reliance on internal practices might show the lack of a relational capability for the company to instigate and maintain the kind of relationships which can open up new opportunities and new markets. Interestingly enough, relationships are also of value even in the closed innovation paradigm, but because of secrecy and specialisation of expertise, such

relationships are never reported as they should be to realistically disclose a social component in science-making and in strategic business operations.

Hard Shell Business Boundaries

A related issue based on the above is the issue of control. The organisation controls and contains all of its activities, innovative or otherwise. Even if partnerships are formed, these are done in ways designed to maintain strict boundaries around activities and in terms of preventing knowledge flows to the outside. This approach also translates to rational communications across departments where information may not be shared other than in terms of need to know basis in information transactions. Examples of consequences include information silos and information hoarding which come about even within departments and not only across them. Another consequence includes information systems which house different information for different organisational functions and with no ability to share information across functions within the organisation and also with the outside. Of course, such information systems (IS) issues are gradually been addressed in newer designs of IS, but the above represent some of the core issues of the closed innovation paradigm which have framed the dominant business model over time. Furthermore, inter-organisational uses of IS and in

SBV-related activity areas are also demanding attention.

Control and Ownership of Intellectual Property

Whatever inventions the company arrives at and which are not translated into innovations taken to market as products remain as intellectual property which the company normally keeps or stores internally. In the close innovation paradigm and its business model, IP is not necessarily up for sale and it is kept around to support internal product-making at present or in the future. A good example of a troubled company in this area is Kodak which has continued to hold on to its patents year after year until recently when the company was confronted with financial troubles, as it could no longer utilise its existing patents internally and in a profitable way. The discussion presented thus far represents “a view that says successful innovation requires control. ... This paradigm counsels firms to be strongly self-reliant, because one cannot be sure of the quality, availability and capability of others’ ideas. “If you want something done right, you’ve got to do it yourself.” (Chesbrough 2003, p. xx).

Absence of Government and Universities

The ideas of the free market and the invisible hand as conceptualised by Adam Smith in his writings were predicated on the notion that market regulation is the outcome of individual behaviours, self-interest and price signals. The Government needs not intervene. Whilst Government involvement is more prevalent at the present time, businesses in general prefer, depending on the issue, a freer hand in conducting their business. Individuals can sort out for themselves ways to act based on their self-interest and based on their own thinking, inventions and innovative methods.

Similarly, organisations, according to the closed innovation paradigm, get the best result when they act in competition with other organisations. They regulate their self-interested behaviours in such ways as to produce organisational profit. Any important innovation must take place solely by each organisation and within its boundaries to benefit its own activities. Therefore, Research and Development are undertaken when necessary internally by each organisation and there is no need for inputs from outside units such as Universities.

Currently, there are many relationships between businesses and Universities for idea and knowledge sharing. In many ways, universities are considered very valuable partners and businesses look to them for

ideas as well as for well-trained and knowledgeable employees. That being said, there are still trust issues and legal documents are utilised to control such working relationships. Also, it should be mentioned that in some instances total lack of in-flow and use of external knowledge might show that a company lacks the imagination and the absorptive capability to take information from the outside and to integrate it into its strategic planning and operations to produce new products. Another issue is total faith within the company in the abilities of internal analysis to paint an accurate picture of changes in the external environment. The latter shielding of internal analysis from critical external sources of analysis might have contributed to the eventual downfall of KODAK. But KODAK is only one in a long line of companies which ignored powerful socio-cultural, technical, environmental and regulatory changes which have transformed the business value context since 1992 or when WWW burst upon our global cultural consciousness as a force for change.

Internal Integration of Innovation

Emphasising a point made above, all innovation is best utilised internally and when integrated in products produced by the company on its own. In other words, as it could be argued by the closed innovation paradigm, a particular innovation should be

translated into a new product by the company using internal methods and know-how. Any research for new knowledge to apply a new innovation will result again in development of methods to be guarded and added to the company's stock of intellectual property (IP). The internal focus by the closed innovation paradigm as described above does not leave much room for making an innovation available at a price to other companies to build other products in the outside.

Of course, many businesses follow a different approach currently in that they may decide to make an invention and associated innovations available to the outside, so long as new products do not compete directly with the company's existing product lines. For example, while Botox can be used as a method to reduce wrinkles, it was initially intended as a nerve toxin. Viagra, currently used as a sexual aid, was initially intended as a means for controlling blood pressure. Such availability of innovations and associated technologies result in a multiplicative capability in the market and additional revenue for the innovation issuing company. Such applications are not simply the product of an invisible hand in the market. They may also be attributed to the innovation issuing company's capability not to ignore other possible uses from a particular innovation, device or process.

Open Innovation Strategy (OIS) Paradigm and ARM Model

A quote from Professor Chesbrough at the start of this section summarises core intentions of the OI paradigm and in a way summarises in reverse what the CI paradigm is not.



Figure 1. Open Innovation's ARM Model

“Open Innovation is a paradigm that assumes that firms can and should use external and internal ideas and internal and external paths to market. ... Open Innovation combines internal and external ideas into architectures and systems whose requirements are defined by a business model. The business model utilises both external and internal ideas to create value, while defining internal mechanisms to claim some portion of that value.” (Chesbrough, 2003a, p. xxiv).

Based on the discussion in previous sections, three capabilities have been selected and reflected in the above model as

A, R and M. Teece, Pisano and Shuen (1997) state that the “term 'capabilities' emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment” (p. 515). The three capabilities stated as Absorptive (A) capability, Relational (R) capability and Multiplicative (M) capability (Chesbrough, 2003 and 2003a; Ferrer, Hyland and Bretherton, 2007; Edwards, 2007) are reflected in the above model as A, R, M or ARM.

The above capabilities were selected because of the internal and external analytical interfacing and forward innovative thrust they can offer a company and its potential partners. Each of these capabilities works well with already established strategy tools such as SWOT and Five Forces. While various authors cited in the paper's list of references do discuss open innovation models, this model offers a blending of capabilities which can arm a firm to interface with other companies and with its environment to enhance business value through shared innovation efforts. The graphical representation is unique to this paper as is the connection to strategic business value (SBV) context. Each capability in the model is discussed in the remaining sections.

Absorptive Capability

A company's absorptive capacity and its ability to bring in and process outside knowledge are critical in ensuring that a company is in a position to continuously use the latest knowledge possible in continuing to make products of value to customers. There are many products and brands which have lasted the test of time. However, tastes do change and in the area of technology tastes change very fast.

Absorptive capability was mentioned as a possible problem for closed innovation and for its business model. In the closed innovation model, the company seeks to develop its innovative ideas relying mostly on internal capability for analyzing information and in producing sufficient amounts of knowledge for implementation. Outside knowledge may not be relied upon to enhance internal capabilities for taking action as it cannot be trusted and may not be appropriate for the company's needs at any rate. In the OIS Paradigm, absorptive capability pertains to actions needed in an organization to be mindful and proactive about the dynamic business environment and the need for organizational learning. Absorptive capability refers to how well a company adapts its internal research and development function(s) to bring in and process knowledge from its partners and intelligence from

scanning the environment.

Internal Research and Development (R&D) functions are important for both the closed and the open innovation paradigms. In the OIS Paradigm, R&D has a multiplicity of roles to play (Owens, 2011). First, there is the internal knowledge production and distribution function. There is also the function where R&D facilitates the import of knowledge from the outside in. And finally, the R&D arm can be used to facilitate the export of knowledge and innovation from the inside to outside markets.

The first function for R&D would be to focus on issues pertinent to knowledge production and distribution of innovation and innovative activities within the organization. In this instance, the knowledge is produced internally and distributed internally for integration into the company's products. The closed innovation paradigm clings to this idea of internal use a great deal and the related argument is that an organization's innovative know-how is part of intellectual property (IP) to be closely guarded. This may be appropriate under some circumstances of initial development, but it can lead to situations as we have seen with KODAK where the company would own many patents, but with not that many of them in productive use.

Subsequently, a second R&D function, somewhat related to the first one, is to find and / or create paths to market for commercial exploitation of internally produced knowledge and innovation to be taken-up by other interested organizations. Revenue flows will be gained from such efforts. However, open innovation strategies are needed in a creative sense to proactively find external arenas where an innovation can become a product of value to consumers.

Furthermore, a third function for R&D impact is to import at a reasonable cost external knowledge in the form of patents, procedures and schematics which can be used to implement a particular innovative idea into an actual product. Alternatively, the organization with an innovative idea and an actual product design may strike a partnership with another company which has a particular process of production in place which is needed for the innovative product to reach the market. Sources of innovation can be many and from the outside, even including customers (Hippel 1988). The World Bank approach to storytelling is not exactly a traditional and closed innovation approach to training and learning. Rather, it relies on an OIS paradigm along with a capability to blend together different ways of absorbing internal and external knowledge from a variety of sources utilizing different knowledge communication formats,

including storytelling (Hippel, 1988; Denning, 2000).

The World Bank instigated an internal program of organizational learning through story telling. Prior to the storytelling ventures as ways to find knowledge and to be proactively innovative, the World Bank was an organization solely focused on making loans to local and international loan seekers. However, now they are also focusing on harnessing the power of knowledge management internally and in finding ways to measure the impact of knowledge use within the organization (Denning, 2000). R&D has a strong role to play in terms of internal research development to aid a company to develop knowledge and even selectively to absorb external knowledge (Cohen and Levinthal, 1990) and this includes different methods, perspective and approaches to learning.

Relational Capability

“Firms develop relational capabilities not only to react to economic pressure but also to proactively become more strategic” (Rosenberg 1994, p. 10). In this instance, the OIS Paradigm is in its full force. Contrary to the hard shell of business boundaries mentioned in the close innovation paradigm business model discussion, the advocated approach by the OIS Paradigm is for

companies to seek external relationships which may eventually change internal practices, perspectives, innovative approaches and product lines. But, most importantly, it would be through relational capability and in instances of mutual value that all relating companies would be successful.

Having said the above, the OIS Paradigm does not advocate for each company in a business relationship to throw the gates open and reveal corporate secrets. Companies entering partnerships to improve their relational capability may also bring different capabilities to the table. Subsequently, existing capabilities translate into power in a 'relational capacity that enables a social actor to influence asymmetrically the decisions of other social actor(s) in ways that favour the empowered actor's will, interest and values' (Ferrer, Hyland and Bretherton 2007, p. 12).

Such asymmetries of power need to be managed and to ensure that the positive value reasons for which partners come together to enhance each other's capabilities are sustained for the long term. There might be needs for training and developing an in-between structure or chain for managing new relational capabilities. Professional agency (Edwards 2007, p. 1) is a means to

ensure that employees are empowered to do their jobs in new relational structures.

The areas of Value Chain Management (VCM) and Supply Chain Management (SCM) are natural domains of knowledge and innovation for a discussion of the ideas advocated in the OIS Paradigm and its Open Innovation's ARM Model discussed thus far. The brief discussion is presented in the following section.

Multiplicative Capability

The closed innovation paradigm strongly endorses the use of the man of a genius mode as a primary mover of innovation ideas within a company. This particular focus is a serious reflection on how knowledge and innovation are brought to light based on the solitary efforts of one person. There is nothing out of the ordinary in the belief that one person can and does produce unique ideas which can and have changed the way that the human race collectively thinks and perceives life on earth and beyond. The heliocentric model of the Universe attributed to Nicholas Copernicus went against established thinking about Man's place in the Universe and has put scientific thought in an entirely different path. Similarly, Charles Darwin's theory of evolution changed our perceptions about

human evolution and the place of Man here on earth.

In actuality, individuals rely on the help of others to conceive, expand and test and generally to bring to light ideas, innovative or otherwise. In many ways, we live on the shoulders of giants in that there are many ideas in existence from the past which shape the evolution of other ideas in the present. More specifically, while the “man of genius mode” is still relevant as a way to invent and to innovate, it is also a fairly static notion and commits the organisation to fixed expenditures in that talented individuals must be hired and maintained on a payroll for them to be innovative. In addition, it really forgoes the infusion of ideas into the organisation from the outside. Managers, however, do “understand that the infusion of fresh ideas can also open their own R&D engineers and technologists to new and different possibilities and cause them to push their thinking further. At a minimum, they agree that better solutions tend to emerge when there are more options to consider in the first place” (Chesbrough 2003a, p. xxiv).

The notion of multiplicative capability still puts a great deal of trust in a company’s most important strategic asset for innovation and that is its people. Contrary to the closed innovation approach, however, the open

innovation focus on multiplicative capability argues that talented and trusted people can also be found outside the company. These individuals can be freelancers, but they may be also working for suppliers and they may even be customers offering feedback for a company’s consideration. Ideas come from many places and organisations must be capable of using internal sensors to listen to new ideas and thus to multiply capabilities for strategic innovation and action. Professor David A. Owens suggests that before an organisation begins to implement an innovative idea, enough innovative ideas must be collected and reflected upon (Owens 2011). Multiplicative capability understands that basic idea and the need for generating enough potentially innovative ideas before one or two are selected to take forward.

Brief Discussion and Future Research Possibilities

Product value is an area of business effort which can include both the production of products as well as collection of information about such products for evaluative purposes. Product value analysis reflects what customers think of a particular product and also how successful corporate marketing strategy happens to be in influencing customer choices through pricing, branding, product design, options, product function, placement and a number of other particular. The activities a company undertakes behind

the scenes in order to bring products to market may not be visible to the consumer for the most part, but they do impact on product value a great deal.

The three capabilities mentioned in the OI discussion section are particularly powerful drivers in bringing products to market and should be further explored for their impact in terms of innovative product development and value analysis. The innovative impact research in this regard need not focus exclusively in consumer products in a traditional sense, but products can be seen as existing in many domains of human effort, including the public sector. Each domain of work has products which they intend for others to consume for information, action and for a particular benefit.

Introduced in 1985 by Michael Porter, the notion of value chain (Porter 1990) refers to all internal and external organisational activities which add value to a product. These activities include what the organisation does internally in terms of inputs and process to produce a product and to external relationships with other organisations which add value to a product in terms of marketing, logistics and transportation to mention a few such activities. The value chain notion is a complex placeholder of how competitive a company happens to be in relation to other companies in the same industry sector. Both VCM and SCM organisational endeavours

rely for their success on the ability of each firm to deploy OIS Paradigm capabilities in ways which enhance innovative efforts in bringing products and services of value to the market.

The discussion about VCM and SCM highlighted the main features and capabilities of the OIS ARM Model presented herein. The intention thus far has been to distil some important and interesting areas of discussion about open innovation and to produce a small number of areas where research can be taken forward. The discussions about VCM and SCM offer an opportunity to relate that model to two important areas in strategy where open innovation paradigmatic ideas are in play. Inter-organisational activities are an area of research which can be revisited with the ARM Model and its OI challenges explored in more detail.

Furthermore, there are other areas such as the Public Sector where it would be interesting to explore the capabilities described in the model in terms of how knowledge is absorbed and used in innovative services and in services the public values. That line of research will be taken forward. Another area of possible research would be to use the OI's ARM Model to explore strategic international agreements in Higher Education Institutions (HEIs). How should the three capabilities constitute HEI partnerships and inter-organisational practices to successfully

deliver educational programmes in the UK and also abroad?

Conclusions

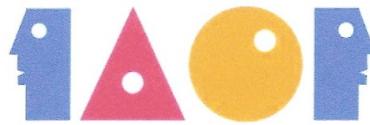
This brief article discussed the close innovation paradigm and identified both strengths as well as weaknesses. The

discussion was then taken further in a presentation of capabilities for value in the open innovation strategy paradigm and a business model using three capabilities (multiplicative, absorptive and relational). A brief discussion of the Open Innovation's ARM Model and future research possibilities were presented.

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EFFECTS OF ICT'S INNOVATIVE APPLICATIONS ON BRAND IMAGE AND CUSTOMER'S PURCHASE INTENTION

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Abstract

Information and communication technologies have been widely adopted in service and production industries. They are one of the important determinants for the rapid growth of the economics. With the flourishing information and communication technologies applied on service processes and product development, this article investigates the relationship of the service concepts delivered by them with customers' brand image and purchase intention. The results show that the innovative service processes with the information and communication technologies enable to enhance customers' brand image and then increase customers' value and their purchase intention.

Keywords: Information and communication technology, Service innovation, Brand image, Purchase intention, Customer value

Introduction

Japan can be called "The Country of Aquariums". Out of more than 500 aquariums worldwide, there are more than 100 ones in Japan and about 35 ones in Tokyo. In such a competitive market, Sunshine Aquarium, not a lot of people knowing it

originally, located in Tokyo and at least one kilometer away from the closest Metro station, tries to let people not get disinterested en route. It created the Penguin NAVI, an augmented reality app, which uses penguins to guide visitors to the aquarium's gates. Smartphone users can download this app from a QR code. The users then simply

follow penguins on their smartphone screen. With this information and communication technology (ICT) application, Sunshine Aquarium's attendance increased 152% in a month! This app successfully enamors humans by cute animals preventing them from looking anywhere else in Tokyo where there are thousands things to do no doubt. How about you? No matter you are a Tokyoer or a visitor, would you intend to pay a visit to Sunshine Aquarium with the penguins when you are or plan to travel in Japan and even recommend it to others?

Dodds et al. (1991) describe consumer's purchase intention as the possibility of a consumer's willingness to purchase a specific product. Studies have revealed that customer's purchase intention is influenced by their motivations and preferences in purchasing a specific brand. During the process of consumers' purchase decision making, brand image is an important cue. Favorable brand information positively influences perceived quality, perceived value, and consumers' willingness to buy (Dodds et al., 1991). Consumers are more likely to choose well-known brand products with positive brand image, because a brand with positive image does have the effect of lowering consumers' perceived risks (Akaah and Korgaonkar, 1988; Rao and Monroe, 1988) or increasing consumers' perceived value (Fredericks and Slater, 1998; Romaniuk and Sharp, 2003; Aghekyan, et al., 2012).

Service innovation is a significantly improved or (re)new service concept or functions offered on the market. It can be a new customer interaction channel, a service delivery system, a technological or non-technological concept, or a combination of them (Miles, 1993). Service innovation is not just a matter of new ideas. Most importantly, it is a process that requires a disciplined approach to rigorously identify and execute the most promising ideas. A service innovation benefits both the service providers, such as companies, and service receivers, customers in most cases, so to improve the providers' competitive edge (Johne and Storey, 1998). Ultimately, a strong product/service brand conveys the core value proposition of both the organization and its products/services in a way that resonates with customers (Keller, 1993). If innovative services, especially with the ICT adoptions, would enhance customers' brand image and their purchase intention would be triggered, the providers would hence improve their business competitive edge.

Thus, this Sunshine Aquarium's innovative marketing activity described above provokes the research motivation of this article. Would the ICT's innovative applications have effects on customers' brand image and then on customers' value and purchase intention?

Literature Review and Research Hypotheses

Despite the continuous growth of the service sectors in the advanced economies, services have long been perceived as noninnovative or technologically backward activities (Gago and Rubalcaba, 2007). The service innovation laggards have gradually changed in the 1990s. The earlier changes were mainly focused on the use of technologies by services activities, notably ICT in creative rather than standard ways (OECD 2005). However, service innovations were implicit in the hardware components and transferred when implemented by service industries, that is, service supplierdominated.

Innovation, or “possession of newness”, is the degree to which customers believe that the product/service possesses important attributes of innovation such as newness and uniqueness (Watchravesringkan et al., 2010). den Hertog et al. (2010) further described innovation as “a new service experience or service solution can consist of a new service, a new service portfolio and/or a new service process that individually or in combination defines a new way of creating value for the customer.” They deliberated that service innovation has to consist of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system.

Among the six dimensions, the second and six ones, relative to the core concept of this article, are the new customer interaction and the role customers play in the creation of value. The interaction process between the service providers and the customers is an important source of innovation of being when the business service itself is offering support for innovation. The sixth one is new service delivery systems. This dimension pinpoints the observation that ICTs have predominantly, but not necessarily exclusively, enabled numerous service innovations.

ICTs help to transform the passive images of services into any forms of innovation so that they have become an important locus for innovative activities in the knowledge economy era (Metcalf and Miles, 2000). The actual innovation and implementation with ICT applications are thus initiated and implemented by organizations, possibly with supports from outside. In this way, the service firms may create a source of innovation which plays an important role to build a bridge interacting with their customers. From a survey conducted by Brynjolfsson and Hitt (2000), the evidence shows the key role of ICT as sources or mediums of service innovation. In this sense, ICTs may be best described as being economically beneficial mostly because they facilitate complementary innovations (Brynjolfsson and Hitt, 2000).

Since service innovation is increasingly regarded as a competitive weapon (Akamavi, 2005), firms that are compelled to seek innovation by the market's constant hungers for better services (Berry et al., 2006). A successful innovation will lead to a better brand image since brand and business reputation are vital functioning of any organization (Coserin, et al., 2012).

Corporate brand image (or corporate image, brand personality), in the literature, is defined as consumers' perception of a brand as reflected by the brand associations held in consumer memory (Keller, 1993). Thus, it is about the consumer's emotional response to a brand that leads to differentiate between alternative offerings (Syed Alwi, 2009). The image associated with brands can influence, among other things, perceptions about quality, value, or price. Therefore, developing a brand image strategy has been described as the first and most vital step in positioning a brand in the marketplace (Park et al., 1986). A positive brand image can also increase marketing communication effectiveness (Keller, 1993).

Service innovation delivered by ICT will bring consumers the impact of emotional and cognitive which leaving good or bad impression in the minds of customers. Once customers' feelings and emotions positively recognized for the evaluation of the service innovative deliverers, the customers will grow the psychological tendency for the

companies. On the contrary, if ICTs' service innovation cannot be recognized or be necessary, the customers' subjective feelings and emotions toward the companies will not largely change or even change negatively (Wang and Liu, 2010). For example, BMW and other car manufacturers provide mobile car configurators to visualize certain car models in 3-D. Compared with other forms of advertising, branded apps, representing a new possibility for enhancing brand images and service satisfaction (Bellman, et al., 2011), are recognized as "useful." As Andrews and Kim (2007) concluded that the brand is "known for a sub-par quality reputation stands to benefit more from innovations than the brand with the established reputation of superior quality."

H1: Service innovation of an ICT application has a positive effect on customer's brand image.

For the ICT development for usage, Technology Acceptance Model (TAM) (Davis, 1989) must be adopted to examine the users' perceptions regarding its effectiveness and innovativeness (Agarwal and Prasad, 1998). The TAM, expanded on Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1980), is the most widely accepted model by the IT/IS researchers as well. In addition, compared with the other model describing customer behavior, Theory of Planned Behavior (TPB) (Ajzen, 1991) which is modified from the TRA too, the

TAM emphasizes the independence of customers in using IT/IS and recognizes the higher decision making power of the customers with ignorance of customers' social and psychological effects.

Davis (1989) defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance her/his job performance," and perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort." TAM indicates that perceived usefulness and ease of use will influence an individual's attitude and behavior when s/he uses an IT/IS. Thus, following the TAM, this article posits that:

H2: ICT's perceived usefulness has a positive effect on customer's brand image.

H3: ICT's perceived ease of use has a positive effect on customer's brand image.

H4: ICT's perceived ease of use has a positive effect on ICT's perceived usefulness.

Consumers are more likely to purchase well-known brand products with a positive brand image because a brand with a more positive image does have the effect of lowering consumers' perceived risks (Olaru,

2008) or increasing consumers' perceived value (Ravald and Grönroos, 1996; Aghekyan et al., 2012; Ghorbani et al, 2014). Understanding a customer's value position is an important management issue for improving customer service delivery (Ravald and Grönroos, 1996; Lindgreen and Wyndstra, 2005). Evans (2002) suggests organizations attempt to maintain and promote customer value continuously for increasing customers' (re)purchase motivation.

Value is commonly described as a "trade-off" between overall benefits gained and sacrifices made by the customers (Ravald and Grönroos, 1996; Lin et al., 2005). Homer and Kahle (1988) indicated that there is conceptual flow from personal values to attitudes to behaviors. Customers usually evaluate their purchase intentions based on the value obtained from the contacts with organizations as referrals for linking to expectations of future benefits (Bolton et al., 2000; Kumar, 2002; Wathne et al., 2001; Kaynak, 2003; Olaru et al., 2008). One important referral is, agreed by some researches, corporate brand image (Osman, 1993; Bloomer and Ruyter, 1998; Buttle, 1998; Kim et al., 2010) since a favorable brand could increase customers' preference and usage, foster feelings of comfort and confidence in the minds of them (Keller, 1993), and provide a brand differentiation among the myriad brands on the market, thus potentially influence

consumers' brand purchase intention (Keller, 2003). That is, a good mentality about brand will have positive effects on customer value such as satisfaction, commitment, and loyalty.

H5: Customer's brand image promoted by an ICT application has a positive effect on customer value.

When a consumer intends to purchase a product, they take specific interest in that product. Customer's purchase intention is composed of her/his feelings, thoughts, experience and external factors that they consider before making any purchase decision (Dodds et al., 1991). Customers' perceived value and brand image are two powerful factors relative to their intentions to purchase (Kim et al., 2010). Existing consumer researches have shown much evidence in the relationship between customers' perceived brand image and purchase intentions. The results all revealed that the customers' purchase intention is influenced by their motivation and preferences in purchasing an especial brand on different applications (e.g., Kamins and Marks, 1991; Aaker, 2003; Bellman et al., 2011; Eze et al., 2012; Lin, 2013).

H6: Customer value promoted by an ICT application has a positive effect on customer's purchase intention.

H7: Customer's brand image promoted by

an ICT application has a positive effect on customer's purchase intention.

The research framework is depicted in Figure 1.

Research Methodology

Quoted "Consumer Lab is a center for marketing research and innovation and also a training platform for business and academics," the Consumer Lab (www.Consumer-lab.es) collects clips which introduce all ICT practices worldwide. Its contents of the articles incorporate innovative service concepts (e.g., window shopping "literally", social networking, earning premiums/ discounts thru games) and/or technologies adoption (such as augmented reality, GPS, brainwave adoption, face detection, etc.) in variety of industries (for example, fashions, welfares, automobiles, foods/beverages, restaurants). These clips are the tools (all re-downloaded from Youtube) for the study. After all the clips reviewed, they are classified with four attributes: industries of the service providers (such as fashion, foods, automobile, etc.), the given purposes of the service/technology (such as promotion, retailing, payment, etc.), the methods/ applications adopted by the service/ technology (e.g., game, social networking, kids, welfare, etc.), and the industries of such methods/applications (not all identical with the first attribute). This study would also like to gain knowledge of whether these

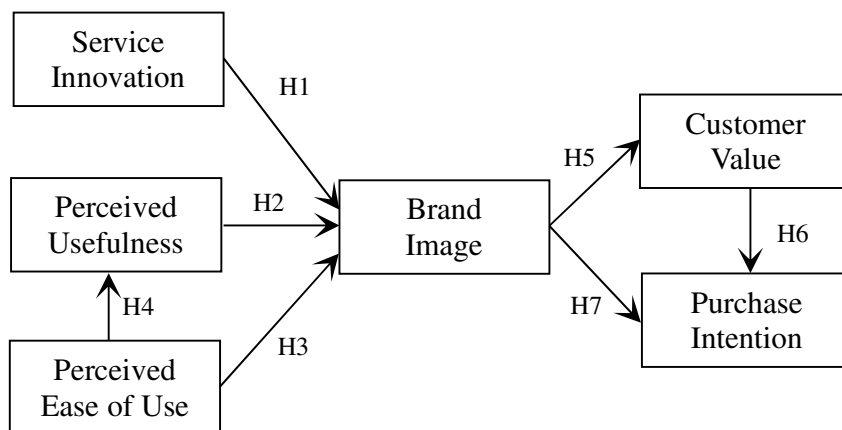


Figure 1. The Research Framework.

four attributes have different effects on the constructs of the framework. Data collection instrument is a self-designed questionnaire. The scales and operative definition for measuring the constructs of the framework are listed in Table 1.

Up to 2013/12/31, there are 353 articles posted on the Consumer Lab. Eliminating clips which are unable to be found on Youtube and in which the service concepts are difficult to be understood /recognized, there are 195 clips adopted in the study. Data collection is at a computer lab in the author's college. Participating students are asked to watch a randomly assigned clip and then fill out the questionnaire. Every clip, lasting 2~5 minutes, is collected 3 samples. Thus, there are 570 valid data out of 585 ones.

Research Results

Internal consistency of the questionnaire is tested through the Cronbach's alpha coefficient (shown in Table 2). After some items deleted, with the item-to-total correlation score being lower than 0.4 (Kerlinger, 1986), all values, exceeding the minimum criterion of 0.7, testify the reliability of the scale. AVEs (average variance extracted), for verifying the convergent validity of the six constructs, are 0.772, 0.825, 0.637, 0.728, 0.894, 0.741, respectively following the sequence listed in Table 2, indicating that the scales of the questionnaire is stable since all statistics exceed the minimum acceptable level of 0.5. Moreover, discriminate validity means the degree of different dimensions or concepts distinguished by the scales. If the correlations, in terms of correlative coefficients, of each construct with others are all lower than this construct's square root of AVE, the discriminate validity of the

Table 1. The constructs with the operative definitions

Construct	Operative definition	Scale	Scale reference
Service Innovation (SI)	Degree of innovation perception toward the service concepts by ICTs (7 items)	To the service/technology: 1. never heard and seen 2. newness 3. practicality 4. novelty 5. interestingness 6. cheerfulness 7. complexity	den Hertog et al. (2010)
Perceived Usefulness (PU)	Degree of usefulness perception toward the service concepts by ICTs (8 items)	To the service/technology: 1. convenience 2. accomplishment 3. entertainment 4. correct information 5. completed information 6. up-to-date information 7. continuous usage 8. recommendation	Davis (1989); Sledgianowski and Kulviwat (2009)
Perceived Ease of Use (PEOU)	Degree of ease-of-use perception toward the service concepts by ICTs (8 items)	To the service/technology: 1. easy operation 2. comprehension 3. enabling being adept 4. easy usage via the introduction 5. taking time/effort on learning 6. taking time/effort for skillfulness 7. feasible fulfillment 8. no fluctuation	Davis (1989) ; Sledgianowski and Kulviwat (2009)
Brand Image (BI)	Degree of impression of the brand of the service providers (8	To the brand/company due to the service/technology: 1. differentiation compared	Keller (1993)

Construct	Operative definition	Scale	Scale reference
	items)	to others 2. easy reference to the brand 3. demand satisfactory 4. positive influence 5. acknowledgement regarding brand (name, logo, slogan) 6. acknowledgement regarding brand information 7. social standing reflection after purchase 8. personal image enhancement after purchase	
Customer Value (CV)	Consisting functional (3 items), social (4 items), and emotional (3 items) categories	To the service/technology: Functional-- 1. needs fulfillment 2. attraction 3. practical utility Social-- 4. social standing 5. proudness 6. social interaction enhancement 7. personal identity Emotional— 8. thoughtfulness 9. satisfactory 10. pleasure	Park et al. (1986); Sheth et al. (1991); Sweeney and Soutar (2001)
Purchase Intention (PI)	Degree of likelihood of purchasing or making recommendation for the providers' products/services (6	To the products/company: 1. increment purchase 2. the most preference 3. recommendation 4. valuable purchase	Fandos and Flavian (2006)

Construct	Operative definition	Scale	Scale reference
	items)	5. willingness for trial 6. high purchase intention	

Table 2. Reliability and Discriminant validity analysis

Construct	SI	PU	PEOU	BI	CV	PI	All
Cronbach's (0.869	0.901	0.885	0.777	0.900	0.936	0.953
	Delete the 3th, 7th referred to Table 1	Delete the 3th referred to Table 1	delete the 5th, 6th referred to Table 1				
SI	0.879						
PU	0.279*	0.908					
PEOU	0.323*	0.458*	0.798				
BI	0.309*	0.437*	0.337*	0.853			
CV	0.422*	0.649*	0.545*	0.646*	0.946		
PI	0.407*	0.572*	0.494*	0.604*	0.801*	0.861	

The bold values on the diagonal are the square root of each AVE.

* indicates significance at 0.05 level.

measuring tool, i.e. the questionnaire of this study, is verified (as in Table 2).

With LISREL 8.8, the favorable fit indexes, in Table 3, indicate the research framework is structurally sound. All paths on the framework have all shown

significantly positive effects (shown in Table 4).

Lastly, results from one-way ANOVA, in order to investigate whether different attributes of ICT's innovative service applications have significant different

Table 3. Overall fit indexes for the structural model

	Fit index	Standard	Result
Chi-square	(2	as small as possible	625.532
	p	p<0.05	0.000
	df		266
	(2/df	2~5	2.352
Goodness of fit	GFI	>0.8	0.865
	AGFI	>0.8	0.835
	CFI	>0.9	0.984
	NFI	>0.9	0.917
	PGFI	>0.5	0.708
Alternative index	RMSEA	<0.08	0.066
Residuals analysis	RMR	<0.08	0.013

Table 4. Structural model results

Hypothesis	Path	Path coefficient	Result
H1	SI → BI	0.230*	Support
H2	PU → BI	0.335*	Support
H3	PEOU → BI	0.243*	Support
H4	PEOU → P U	0.431*	Support
H5	BI → CV	0.732*	Support
H6	CV → PI	0.968*	Support
H7	BI → PI	0.828*	Support

* indicates significance at 0.05 level

Table 5. ANOVA of ICT applications on the constructs

Attribute	SI	PU	PEOU	BI	CV	PI
Industry of the provider	0.806 (0.399)	0.475 (0.993)	0.378 (1.068)	0.915 (0.648)	0.637 (0.899)	0.069 (1.428)
Applied industry	0.249 (1.213)	0.837 (0.722)	0.326 (1.113)	0.866 (0.704)	0.416 (1.035)	0.743 (0.792)
Purpose of the provider	0.236 (1.229)	0.560 (0.932)	0.189 (1.259)	0.604 (0.906)	0.331 (1.094)	0.528 (0.952)
Service application	0.638 (0.847)	0.448 (1.013)	0.299 (1.137)	0.138 (1.453)	0.964 (0.608)	0.100 (1.506)

The statistics in cells represent p values and F statistics in parentheses.

effects on the constructs of the framework, imply that no particular industries and no particular ICT applications outperform to enhance customer's brand image, increase customer value, and invoke customer's purchase intention (as in Table 5). Further, none of one ICT's service/technology could best deliver the concepts of service innovation, perceived usefulness, and perceived ease of use.

Conclusion Remarks and Implications

This article addresses, with a theoretical basis, the practical merit of current flourish smartphone apps, augmented reality entertaining applications, and so many interesting /useful service innovative concepts based on the ICT collections worldwide on www.consumer-lab.es. The research results encourage any industry, from automobile to restaurant /foods,

adopting any ICT application on, from game to social networking, in order to deliver its brand image for any business purpose of from new product introduction to business/ brand promotion. All of which direct to help increase customers' value and purchase intention and therefore enhance the service providers' business benefits.

The service investments should result in a new standard of service that causes an "excited" reaction from the customers. This excitement occurs only when a new service system succeeds where redefines to experience a transaction. Specially, the new standard of service must convince the customer that the provider's service is somehow special compared with the service of other providers.

Service innovation is fundamentally based on evolving customer behaviors and

market trends, and thoroughly understanding customers is critical for any service business because customers and their decisions are the source of all revenue. In service design customers are no longer seen only from an observational perspective; nevertheless, it encourages companies to take genuinely people centered and empathetic approaches. Distinguished service providers should take great consideration of their customers. This article testifies that brand image and purchase intention of customers can be enhanced and provoked by the delivery of ICT applications with innovative concepts.

Moreover, the TAM is commonly used to examine users' acceptance of new technologies for the necessary consideration on the technology development and the influence on the users' attitude and behavior. This article expands the TAM to explain the acceptance of the service concepts delivered by ICTs on the belief-attitude-intention relationship. Besides, the description of users' attitude, in this article, specifying customer's brand image and purchase intention, to the author's knowledge, is the first trial in the literature. The study results contribute to fields of academic and service industries.

Although, there are no strong

evidence show the particular industries of the service providers and service applications outperforming capabilities of service innovation, customers' brand image, purchase intention, etc. Researches could further investigate the traits and norms of service innovation delivered by ICTs for better invoking customer's brand image, values, and purchase intention.

Among the clips adopted in the study, many of them are delivered innovation by smartphone apps. Smartphone apps seem to provide a pull marketing opportunity delivered via a platform to which consumers have strong emotional attachments. Moreover, branded apps offer the unique benefits afforded by mobile marketing communications, following consumers wherever they go while being able to be updated with the latest localized information and deals.

While designing an innovative service process with an ICT application that customers find useful in their daily lives in order to provoke them to consider the service providers' brand when their purchases occur and/or they recommend this brand to others, the service designers should not neglect the diffusion power of Internet/ social networking.

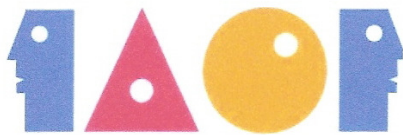
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THE ROLE OF ICT MANAGEMENT TO ACHIEVE ORGANIZATIONAL INNOVATION

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Abstract

The intention of this study is to focus on the technological driver of the organizational innovation. In particular, review and examine the effects of the use of Information and communication technologies (ICT) to obtain organizational innovation. This study is to contribute in the understanding of the effectiveness of ICT to form new organizational methods, organizational models or any other sort of organizational innovation. The study proposes basic criterion on the ways ICT can influence organizational innovation. The study is to contribute in understanding the ultimate aim of the organizational innovation that is to say to increase a firm's performance.

Key Words: ICT, technology, organizational innovation

Introduction

In the literature, the term 'organizational innovation' is solely used but there are no details yet available to categorize further i.e. the organizational innovation in terms of new business model, organizational structure, decision-making, process or any other method. It is also important to understand what sort of ICT is influential in the organizational innovation. Firms with the same automatic IT links or web facilities may use them differently and it is crucial to capture these differences. It is crucial to find the inter-relationship between ICT and organizational innovation. The article elaborates the concept of the organizational innovation by uncovering its components. The study will also elaborate ICT by recognizing its level, frequency, and volume. Later, inter-related links will figure

out to understand the relationship.

Literature Review

No matter what advantages a business has today, eventually changes in the marketplace cause every competitive advantage to degrade. When this happens, past's advantage may mean nothing. In the face of this problem, there is one critical response: innovation. Innovation enables existing advantages to be maintained and new advantages to be created (Morris, 2013).

The development, adoption, and implementation of innovations are critical determinants of organizational competitiveness and effectiveness (Baregheh, Rowley, & Sambrook, 2009). The distinguishing features of an organizational innovation

compared to other organizational changes in a firm is the implementation of an organizational method (in business practices, workplace organization or external relations) that has not been used before in the firm and is the result of strategic decisions taken by management. (OECD/Eurostat, Oslo Manual, 2005). Damanpour (1991), Sorensen and Stuart (2000), defined as innovative change in a non, or rather less, technological manner to a firm's nature, structure, arrangement, practices, beliefs, rules or norms (Pettigrew and Fenton, 2000), and Schumpeter's "new ways of organizing business". An organization has to continue to innovate to demonstrate its uniqueness in order to maintain its competitive advantages (Wernerfelt, 1984; Berry, 1991).

Organizational innovation is also an important factor of influence on innovation quality and performance. It includes new leadership styles, organizational culture and commitments that can directly impact on employees' willingness to contribute (Belassi & Fadlalla, 1998; Hooff & Weenen, 2004; Jaramillo, 2005).

Linton (2002) suggested that the factor behind successful introduction of organization innovation is communication. Information capital is an essential category of assets for implementing any business strategy, which includes the organization's databases, information systems, networks, and technology infrastructure (Kaplan & Norton, 2004). In contemporary organizations, information and communication technologies (ICT) pervade every aspect of an organization's value chain, creating a vast electronic network of interconnected applications and data (Kohli & Melville, 2009). Ritchie and Brindley (2005) define ICT as "the array of primarily digital technologies designed to collect, organize, store, process and communicate information within and external to an organization". One

of the fundamental characteristics of the ICT is the high connection intensity. In other words, these technologies are standardized interfaces that allow sharing information, resources, knowledge, and complementary competencies between actors, independently from the business system. These elements are crucial in activating the process of co-production of value (Sanchez, 1996).

ICT often functions as a catalyst for innovation (Thaens, 2006). Zuboff (1987) found that the 'first era' of organizational computing in the 1970 and 1980s has concentrated on automating tasks, whereas when IT was used to 'informate' work it generated far greater competitive advantage.

ICT has three basic characteristics: it is pervasive as it spreads to most sectors of the economy; it improves over time and hence keeps lowering costs for users; and it spawns innovation, as it facilitates research, development and market introduction of new products, services or processes. This last property can be termed the "enabling role of ICT for innovation" (EC, ICT for Competitiveness and Innovation, 2010). ICT has the potential to increase innovation by speeding up the diffusion of information, favoring networking among firms, enabling closer links between businesses and customers, reducing geographic limitations and increasing efficiency in communication (Spiezia, 2011).

ICT achieves competitive advantage as it provides substantial efficiency gains. ICT makes it possible to reduce transaction costs, improve business processes, facilitate coordination with suppliers, fragment processes along the value chain (both horizontally and vertically) and across different geographical locations, and increase diversification (Koelinger, 2005). Porter and Millar (1985) argue that ICT affects competition in three distinct ways: (i) ICT may change the industry

structure, and modify the competition rules; (ii) ICT may be used to create sustainable competitive advantage and to provide new competitive instruments for firms; and (iii) ICT may be used to develop new business inside the firms.

Previous analysis confirm that ICT play an important role in enabling business innovation, e.g. Brynjolfsson and Hitt, 2000; Gago and Rubalcaba, 2007; Crespi et al., 2007; Spiezia, 2011; Eurostat, 2008; Van Leeuwen, 2008; Polder et al., 2009. These studies, however, differ as regards they do not focus on the link between ICT and organizational innovation. Rare studies made on level and kind of ICT enabling the organizational innovation (see Spiezia, 2011). Sapprasert and Clausen's (2012) empirical examination of the role of organizational innovation analyzes a data set of Norwegian firms based on two waves of the Community Innovation Survey(CIS) undertaken around 1999 and 2004, respectively, which contains information on firm's participation in organizational innovation. The analysis covered both manufacturing and services, showed that although technological innovation is more common, organizational innovation is also widespread, particularly in services.

Organizational innovation is found to be characterized by relatively high persistence over time, and such persistence is conducive to superior firm performance. Consistent with evidence from historical analyses and case studies, the authors find that organizational and technological innovation balances one another (Fegerberg, 2012). Similarly, a large scale quantitative study of German manufacturing and service sectors by Schmidt and Rammer (2005) found that technological and non-technological innovation were often

linked to each other, and had similar determinants, suggesting that the decision to innovate was driven by similar factors. They also found that firms that combined product and process innovations with marketing and organizational innovations performed better in terms of innovation sales and process innovation driven cost reductions (conditional upon the adoption of both organizational and marketing innovations).

Hypothesis

Level of the ICT

H1: (Level) of ICT relatedness with the organizational innovation.

Rapid advancements in the ICT require up-to-date studies to classify it according to its usage. In this study, it would be necessary to classify ICT into different levels and further study it for its relatedness with the organizational innovation. Few of the previous studies are discussed here.

In a Communication published in September 2009, the European Commission introduced a focus on "key enabling technologies" (KETs), i.e. technologies that will be of crucial importance for the development of new products and services over the next five to ten years. ICT is relevant for all of these KETs in almost all high-tech applications. The EC identified five KETs: nanotechnology, microand nanoelectronics (including semiconductors), photonics, advanced materials, and biotechnology"(EC, ICT for Competitiveness and Innovation, 2010).

Table 1.

Main ICT Categories	Technologies - Systems
Enterprise Systems	Enterprise Resource Planning – ERP & ERP II or XRP Customer Relationship Management - CRM Supply Chain Management - SCM
Information Systems	Transaction Processing Systems - TPS Management Information Systems - MIS Decision-Support Systems - DSS Executive Support Systems - ESS
Digital Technologies	E-Commerce (refers to electronic transactions such as procurement and sales over the Internet) – B2B, B2C, B2G E-Business (refers to automated business processes (both intra-and inter-firm) over computer mediated networks – Intranet, Extranet
Telecommunication Systems	Internet, e-mail, voice over IP Local Area Networks Wide Area Networks Virtual Private Networks
Identification and Data Capture Technologies & Telematics Technologies	Portable Data Collection, Hand Held Readers, Magnetic & Smart Card Readers, RFID and so forth.

Source: Papastathopoulos, Anastassopoulos, Beneki (2009)

Table 2. The Three Varieties of Work-changing Information Technology (IT; McAfee, 2006, p. 145).

Category	Definition	Characteristics	Examples
Function IT	IT that assists with the execution of discrete tasks	Can be adopted without complements Impact increases when complements are in place	Simulators, spreadsheets, computer-aided design, and statistical software
Network IT	IT that facilitates interactions without specifying their parameters	Does not impose complements but lets them emerge over time Does not specify tasks or sequences Accepts data in many formats Use is optional	E-mail, instant messaging, wikis, blogs, and mash-ups
Enterprise IT	IT that specifies business processes	Imposes complements throughout the organization Defines tasks and sequences Mandates data formats Use is mandatory	Software for enterprise resource planning, customer resource management, and supply chain management

Organizational Structure and the ICT

H2: The new organizational structure (form, model, method, etc) relates with the frequency of the ICT use.

H3: The new organizational structure (form, model, method, etc) relates with the volume of the ICT.

Porter pointed out that ICT has the potential to change the structure of existing industries and to create new ones. His Value Chain model positioned IT in the context of the overall organization (Porter, 1980, 1985). Fulk and DeSanctis summarize major changes that are taking place in electronic communication technologies and the evolution in organizational form. They suggest that five features of ICTs have important advancements and consequences for organizations and their form: dramatic increase in the speed of communications, reductions in costs of communication, rise in bandwidth, vastly expanded connectivity, and integration of communication with computing technologies enabling communal capabilities in communication (Barrett, 2005). ICT have the potential to support new organizational forms with communication cultures to enhancing learning and innovation (Reich, 1991). Business model innovators look at the market and see something different than others see, they see possibilities that others have overlooked, and they transform those possibilities into competitive advantages, and profits (Morris, 2013).

Mintzberg (1979) analyzed four types of contingency factors, the organization itself and its members, the distribution of power, the environment and the technical system that affect the organizational designs of positions, superstructure, lateral linkages and decision-making systems. In result five configurations of structures are simple structure, machine

bureaucracy, professional bureaucracy, divisionalized form, and adhocracy (Lam, 2004).

The postmodern organization may be define as that comprising a networked set of diverse, self-managed, self-controlled teams with poly-centers [many centers] of coordination that fold and unfold according to the requirements of the tasks. Likewise, these teams are organized in flat design, employees are highly empowered and involved in the job, information is fluid and continuous improvement is emphasized throughout (Boje and Dennehy, 2000). Modern organization theories suggest both inner efficiency and market efficiency, and both can be gained by appropriate use of ICT(Lin,2013). Orlikowski(1992) mentioned the duality of IT, where business strategy determines the adoption of IT and also the application of IT influences the organizational structure.

H4: Increased integration of ICT with job tasks increases the organizational innovation.

Decision-Making and ICT

H5: Decision-making fastens with the use of ICT

The relationships between ICTs and organizations' decision-making and communication capacities have been extensively documented in the literature (Daft and Weick 1984; Daft and Lengel 1986; Orlikowski and Robey 1991; Orlikowski 1992; Zack and McKenney 1995; Pickering and King 1995; Dewett and Jones 2001). The introduction of ICTs within an organization offers the possibility for the actors to collaborate and communicate and it can produce redeployments of missions or powers, changes of the current balances ,

leading positive or negative effects (Clermont et al, 2010).

The decision is often a complex activity for which ICTs may have different effects. If we consider, for example, the decision making process defined by Simon (Simon 1960), ICTs can help: to search information on the problem to be solved, to design possible solutions, to evaluate different solutions and to choose among them, to control the implemented decision.

ICTs can affect all organizational levels and change the environment of decision makers and actors by: an enrichment and improvement of information, skills and expertise, an expansion of action zones, and the feasibility of remote work (Clermont et al, 2010).

Discussion

ICT's effectiveness encompasses all aspects of business like marketing, organization & management, finance, human resource management etc. Consecutive studies are required to cover those areas as organizations are subject to rapid changes due to advancements in the ICT and their respective adoption. The organizations are subject to swift changes in their nature, structure, arrangement, practices, beliefs, rules or norms due to ICT. This study is an attempt to propose an exploration into the ICT management's role to achieve the organizational innovation.

The study will not just only help to understand the organizational innovation brought up by the ICT, but it will also help to

form innovative organizational structures, models and all other practices within the organization by the mean of ICT.

The importance and influence of the ICT to achieve organizational innovation is evident from the previous studies as discussed in the literature review. On the other hand, rare literature exists to explain the inter-relation between ICT and organizational innovation. The plan of this study is to perform research to have complete understanding of the ICT management by elaborating its nature of use within the organization and finding its linkage with the organizational innovation.

Furthermore, to propose elaboration of the concept of organizational innovation into categorical form. The ICT's wide-ranging effect on the structure, arrangement, practices, beliefs, rules of the organizations will likely to help to do so. The proposals/hypothesizes in this study are meant to perform detailed research and determine such relations and effort to express them in the literature. In the beginning, the focus is on finding the inter-relation between ICT and few of the aspects of the organizations like decision-making and organization structure. However, in the later part, the plan is to broaden the scope of research and encompass all other aspects of the organizational innovation.

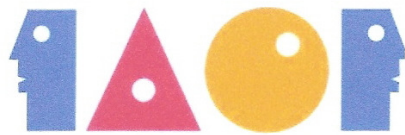
The aim of the study is to disclose the area of research that has a key importance within the literature but not explored yet. Therefore, it will be challenging, appealing for this study, and highly motivating for other researchers to contribute.

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THE ANTECEDENCE OF ENTREPRENEURIAL ACHIEVEMENT

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Abstract

Someone's accomplishment is determined by his ability and by the strength of his strive to achieve success, strive to get success is determined by the individual's personality in facing the situation around him.

This research was aimed to know (1) individual characteristic that consists of ability, locus of control & learning goal orientation had significant effect to self efficacy, (2) self efficacy had significant effect to achievement motivation, (3) achievement motivation had significant effect to entrepreneurship achievement, (4) ability had significant effect to entrepreneurship achievement.

The subject of this research included students Airlangga University. Sampling technique used was Census technique. Students participated as research sample had been getting entrepreneur grand. Statistical method used was linear regression analysis technique, supported by SPSS 10.00 program.

Result of this research revealed that individual variabel characteristic that significantly effect self efficacy and entrepreneurship achievement was ability, while learning goal orientation and locus of control had no significant effect to self efficacy. Self efficacy also have significant effect to achievement motivation & achievement motivation have significant effect to entrepreneurship

achievement.

Key words: Ability, Learning Goal Orientation, Self Efficacy, Locus of Control, Achievement Motivation, Entrepreneurship Achievement.

Introduction

The Department of Cooperative and Small Enterprise Development had changed the term 'private working to be 'private entrepreneurship'. Private entrepreneurs means the people who have the entrepreneurial natures among others daring to take a risk, priority, creativity and giving examples in handling the business/company by relying on self-drive and ability. The successful private entrepreneurs can be measured from their ability in completing the process and creativity, then producing the innovation, up to the stage when his or her application can be spread out and penetrate the markets (local, regional, international) with a certain level of profit (Nugraha: 2007).

Private Entrepreneurs are decision makers who help establish the free economic system of a company. Carrier of Private Entrepreneur can support the welfare of community and produce the actual financial income. Private entrepreneurs in various industries help the economy by providing job opportunity and producing goods and services for consumers either domestics or overseas. Although big companies attract attentions of many people, such small businesses and the entrepreneurial activities at least give actual portion to the social life and to the world economy (Susanti and Herawati: 2009).

The earning in private entrepreneurship is really attractive, but there is also costs related to the ownership of such business. To start and operate our own business, hard-working would be the requirement, consuming a lot of time and requiring the emotional

strength. The possibility to be fail in business is a threat always available for all private entrepreneurs, no success ensured all the time.

Private entrepreneurs have a wide range of risks associated with business failure. The challenges are in the forms of hard work, emotional pressure, and the risk for asking a certain level of commitment and sacrifice if we expect to get the repayment (Susanti and Herawati: 2009).

Attitude and behaviour are strongly influenced by someone's nature and characteristics. Good nature and behaviour are progress oriented and positive constituting the nature and characteristics required by private entrepreneurs in order to be successful and make progress. According to Miner (1996), the type of personality of private entrepreneurs can determine the field of business able to lead them to be successful. Based on his research, he finds out that a private entrepreneur will be successful if he or she follows a certain achieving route pursuant to the type of his or her personality, in which such types of personality of private entrepreneur are classified into 4 (four) categories, they are: Personal Achiever, Super Salesperson, Real Manager, and The Expert Idea Generator.

University as the place to establish competent human resources must be capable enough in establishing teaching – learning process that helps stimulate motivation of the students in digging more of their curiosity up and also creating a conducive learning atmosphere related to entrepreneurship. According to Robbins (2003), the work performance, in this case, is the successful achievement in

private entrepreneurship of a student determined by his or her ability, motivation and the opportunity. The ability itself does not guarantee that a student is able to make achievement as a private entrepreneur. He or she needs a support for self-motivation, if it is studied more deeply. A success of someone is determined by how strong the self-drive of an individual to reach the success in private entrepreneurship.

Motivation to create an achievement is determined by the characteristics of the individual himself or herself. The individual characteristic is the internal condition attached to individual. The first individual characteristic covers academic ability, namely the achievement possessed by an individual when he or she enrolls to a university when it is seen from the scores of his/her UNAS (State National Examination from the Senior High School, locus of internal control named the confidence in individual that he or she is capable to control the events occurring in his or her life and the belief that individual success is strongly determined by the struggling power of the individual himself or herself. The other individual characteristic is the faith through the good learning process, his or her ability can be developed so that the individual is able to reach an achievement. The confidence to be able to get an achievement should be supported by a motivation to get achievements so that it can obtain a good private entrepreneurship achievement.

This research tries to integrate the variables of individual characteristics consisting of ability, locus of control, self-efficacy, and achievement motivation as the framework to explain and predict the private entrepreneurship achievement of a student. This research is expected to be able to provide empirical evidences from the variable testing that will be influencing the private entrepreneurship achievement of the

student successful in obtaining the grand in managing his or her business.

Formulation Of Problem

Problem formulations presented in this research are as follows:

1. Do the variables of individual characteristics consisting of ability, locus of control, and orientation of goal have significant positive influences on the self-efficacy?
2. Does self-efficacy have a significant positive influence on motivation to make achievements?
3. Does achievement motivation have a significant positive influence on the entrepreneurship achievement?
4. Does the ability have a significant positive influence on entrepreneurship achievement?

Purposes

The main purposes of the study are to find out:

- A. Whether the variables of characteristics of individual ability, locus of control, and learning goal orientation have significant positive influences on self-efficacy
- B. Whether self-efficacy has significant positive influence on achievement motivation
- C. Whether achievement motivation has significant positive influence on entrepreneurial achievement
- D. Whether the ability has significant positive influence on entrepreneurship achievement

Benefits Of Research

The benefits of research are as follows:

.....Giving contribution of some thoughts about the good cognitive ability of a student without accompanied by strong motivation to make achievement will not produce any good entrepreneurship's achievement. This is the reason that the university should develop the process of innovative learning related to the entrepreneur-ship capable of stimulating the internal motivation of students to make achievement.

.....Providing an insight to students that the institution only facilitating the formation and motivation to make the achievement is highly dependent on their own to respond creatively during the process of running a business.

Review Of Literature

Theoretical Basis

Ability.

Robbins (2003) states that the ability is an individual's capacity to perform various tasks in a job that consists of intellectual ability and physical ability. Performance is a function of ability, willingness and opportunity. Individuals who have good ability and willingness or high motivation supported by the opportuni- ties will generate a higher performance. Bempechat et al., in Button, Scott B. et al. (1996) suggest that ATP is a comprised of a series of skills and dimensions that can be expanded through effort and experience.

A number of skills and capabilities of this dimension can be improved through individual efforts and experiences. Level of ability can be used to predict performance. Individuals who have a high skill level are

predicted to complete the task faced by both. Also, individuals who have high potentials will be able to achieve higher performance. Research by Earley & Lituchiy (1990), states that the Ability can affect self-efficacy. Individuals with high ability levels will have confidence in completing certain tasks.

Locus of Control.

Locus of control is understanding the degree of individual's beliefs dealing with the source of determinant of behaviour or events happening in their life, divided based on internal locus of control and external locus of control (Robbins, 2003). Of individuals' belief that they are able to carry out and complete the task properly because of their own business, it can be said the people have an internal locus of control. Individual thought that the successes and failures are due to the surrounding environment, it can be said that those people have the external locus of control. This is because individuals having internal locus of control perceive themselves to have excellent ability and high optimism in achieving the tasks. In other words, individuals with an internal locus of control tend to have high self-efficacy.

Learning Goal Orientation.

It can predict the performance goal orientation on environmental education (Dweck, in Johnson et.al, 2000). The orientation of individual learning goals focuses on developing strategies and complex task. Strategy development and complicated task will provide high confidence (self- efficacy) on their ability to complete the tasks. Elliot and Dwek (1988) in the Button, Scott B. et al. (1996) suggest:

"A learning goal orientation promotes" Mastery oriented "responses. The Mastery oriented pattern response involves seeking

challenging tasks and maintaining effective striving under difficult conditions. When these individuals are faced to failure, they want to behave as they want to have received through useful feedback. They respond with "solution-oriented self-instructions, as well as sustained or increased positive effects, and sustained or improved performance."

Derived from the construct of goal orientation in the field of education, it suggests that individuals have a learning orientation or performance orientation in completing the task (Dweck, 1986). Both orientations are theorized as the properties (traits), although they can be manipulated by situation (Dweck, 1989; Duda & Nicholls, 1992).

Achievement Motivation.

Motivation is the internal conditions of a specific and direct behaviour to a destination (Robbins, 2003). McClelland's (Gordon, 2002) explains that there are three types of needs, they are:

1. Need for achievement (N-ach). It reflects an individual's desire to accomplish goals and demonstrate competence or Mastery. People having high this kind of need focus on their energies on getting a job to be well done and quickly.
2. Need for affiliation (N-aff). It resembles Maslow's belongingness needs and Alderfer's related need. It describes the need for social interaction, love, and affection.
3. Need for power (N-pow). It reflects the need for control over a person's own work or the work of others. Ruling monarchs, political leaders, and some executives in large corporations typically have a need for power.

Self-Efficacy.

Self-efficacy is a belief in someone that he or she can run a task on a certain level. Kreitner and Kinicki (1992: 89) have defined it as follows "Self-efficacy is a Person's belief about his or her chances of successfully accomplishing a specific task." Self-efficacy can be regarded as personal factors distinguishing each individual. Self-efficacy changes may cause changes in behaviour, especially in accomplishing tasks and goals (Philip & Gully, 1997). Consequently, it is directed at the changes done by individual goal setting. For example, confidence in the ability to accomplish a higher purpose because parents encouragement then the self-efficacy is also high.

Bandura (1989:729) divides the high and low confidence. It indicates high confidence if certain individuals can do something charging him while low self-confidence shows on untrustworthy of someone to complete a job. High confidence is shown by the following behaviours:

Being active selecting best opportunity
 Managing the situation,
 Avoiding or neutralizing obstacles
 Setting goals,
 Establishing standards Plan,
 Preparing,
 Practicing
 Trying hard,
 Persevere
 Creatively solving problems
 Learning from setbacks
 Visualizing success
 Limiting stress.

While the behaviour patterns of low self-confidence are as follows:

Be passive: In contrast to the active, passive and they are often put off work or have no initiative to do something work.

Avoid difficult task: always tried to avoid the tasks that he thought it difficult or be difficult for him.

Develops weak low aspirations and commitment: having low aspirations, tend to always went along with it and low commitment.

Focus on personal deficiencies: always focused on the lack of self, feeling like a man of many faults.

Do not even try make a weak effort: rarely ever want to try something.

Become discouraged when you see their past experiences himself or others.

Blame setback on lack of Ability or bad luck: the past feel bad happened because I was not lucky or because of his inability.

Experiences worries, stress, changed from depressed: often worried, often experiencing stress and can become depressed.

Failing think of excuses for: always looking for excuses when failing to do something.

Pearlin et al., Bradley, and James (2004) reveal that Self-Efficacy can be measured by four items, they are:

I can do anything I really set my mind to do. Sometimes I feel that I'm being pushed around in life.

There is really no way I can solve some of the problems I have.

I have little control over the things happening to me.

Entrepreneurship and Entrepreneurial Performance

As quoted by Neck (1999), entrepreneurship has been conceptualized and defined in many different ways (e.g. Cooper and Dunkelberg, 1986; Schollhammer, 1982). According to several scholars, however, the underlying key concept to entrepreneurship is new entry by the firm and the act of launching a new venture (Lumpkin and Dess, 1996). These scholars also suggest that there is a difference between entrepreneurship and entrepreneurial orientation (EO). While the former refers to the act of “new entry”, the later refers to “the processes, practices, and decision-making activities leading to new entry”, (Lumpkin and Dess, 1996, 136). Building upon this distinction, we utilize this “firm” level concept as we define “individual” entrepreneurial performance as a behavioural construct as opposed to an outcome construct. In other words, rather than defining entrepreneurship performance by outcomes achieved (e.g. sales growth, market share, profitability), we operationalize performance as specific behaviours or “processes” displayed by an entrepreneur. In this view, we define entrepreneurial performance from a “process-perspective” (rather than a content perspective), that is, the focus will be on the methods, practices, and decision-making activities that lead to entrepreneurship (new entry into established or new markets (see Lumpkin and Dess, 1996 for more extensive discussion of this process/content issue).

A summary of these processes posited by Lumpkin and Dess (1996) follows. Autonomy refers to the independent action of an individual or a team in bringing forth an idea or a vision and carrying it to completion. In general terms, it means “the ability and will be self-directed in the pursuit of opportunities” (1996, p. 140). Innovativeness implies the tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes. Risk

taking involves one's proclivity to engage in risky projects as opposed to engaging in projects from which expected returns are certain. Proactiveness means acting in anticipation of future problems, needs or changes; and the initiating of activities. Finally, Competitive aggressiveness refers to the propensity to directly and intensely challenge its competitors to achieve entry or improve position. Entrepreneurial performance is thus conceptualized as the degree to which the entrepreneur exhibits any or all of these methods, practices, and activities that lead to new entry, that is the degree to which the entrepreneur exhibits these key entrepreneurial processes. It is important to highlight, however, that Lumpkin and Dess's (1996) work focusing on the firm level whereas our arguments here focus on the individual level of analysis. A question that should be highlighted is "do each of these five entrepreneurial orientation dimensions apply with equal force to an individual entrepreneur?". We feel that the application of these organizational level variables to an individual vantage is appropriate given by Lumpkin and Dess's (1996) admission that while entrepreneurial orientation is a firm level based concept, it also "involves the intentions and actions of key players functioning in a

dynamic generative process aimed at new venture creation" (pp. 136-7). Thus, the argument proposed here is that all five entrepreneurial orientation firm-level dimensions are to varying degrees appropriate for describing entrepreneurial behaviour of the individual. Indeed, research does provide support for the benefits associated with the "individual level" processes of autonomy (e.g. Levine and Tyson, 1990; Hackman, 1986; Manz, 1986; March, 1955; Morse and Reimer, 1956), and innovativeness (e.g. Woodman et al., 1993; Shalley, 1995). In terms of the former (autonomy), Wainer and Rubin's (1969) study of entrepreneurs who had started their own company find that their strong achievement need is one primary factor associated with their companies' success. Also, another study concludes that to maximize success and satisfaction, the need for autonomy should be strong among business entrepreneurs, moderate among tenured professors, and weak among bureaucrats (Harrell and Alpert, 1979). Regarding the later (innovativeness), Collins et al. (1970) study suggests that entrepreneurial champions (entrepreneurs who are committed, persistent, and courageous in advocating innovation) are required for the success of new business ventures.

Conceptual Framework

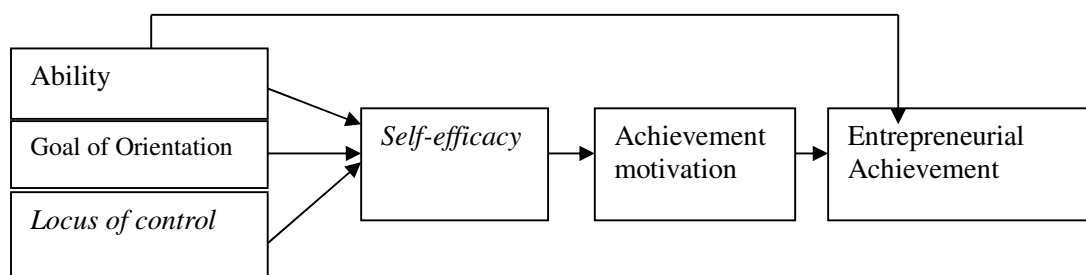


Figure 1.

Conceptual Framework Scheme

Research Hypotheses

1. *That the variables of ability, locus of control, and learning goal orientation have positive and significant impact on self-efficacy.*
2. *That self-efficacy has significant positive effect on achievement motivation.*
3. *That achievement motivation has significant positive effect on entrepreneurship achievement.*
4. *That ability has significant positive effect on entrepreneurship achievement.*

Research Method

Research Approach

The approach used in this research was descriptive explanatory. Descriptive explanatory is an approach that describes variables of the study and explains the relationship between these variables.

Identification Of Variables

The variables used in this study consisted of independent and dependent variables, namely:

The dependent variable was self-efficacy (Y_1), achievement motivation (Y_2) and entrepreneurial performance (Y_3).

The independent variable was ability (X_1), learning goal orientation (X_2), locus of control (X_3).

Operational Definitions

Ability (X_1) - It is defined as the capacity level of respondents in completing tasks and

goals. The measurement was by grade point average and extracurricular activities that described interpersonal skills in social and community environment.

Locus of control (X_2) - It is the degree of individual beliefs about the source of the determinant of behavior or events happening in his or her life, which is divided based on internal locus of control and external locus of control (Robbins, 2003). Locus of control measurement instruments used in this study was the instrument developed by Paul E. Spector (1988). Those instruments measured the locus of control using a four point Likert scale (1-4). In this research, the statement items measured internal and external locus of control. Each of them consisted of 10 statements, so in total there were 20 statements. Questionnaire was designed to measure the average propensity to external locus of control a person had. Therefore, the first revelation of the ten items on the internal locus of control was a statement of the inverted (reversed score). The average value of the answer was 20 items of statement from high of respondents who indicated that the respondents were likely to have an external locus of control.

Learning goal orientation (X_3) - It is the individual response-oriented expertise including searching for a challenging task and maintaining effective tough business conditions.

Self-Efficacy (Y_1) - Self-efficacy is a belief in someone that he can run a task on a certain level. Instruments of measurement instruments used were developed by Pearlin et al. cited by Bradley, Don E. and James A. Robert (2004).

Achievement motivation (Y_2) - It is the driving force that causes an individual willing and ready to deploy the ability to do activities becoming his or her responsibility.

Performance / Achievement Entrepreneurial (Y3) - It describes what have been accomplished by individuals, or in other words, actual results have been achieved. When setting goals are made, and individuals strive to achieve it, the results of what have been done will be obtained and viewed.

Sampling Technique

The study population consisted of students who obtained a grand Airlangga University grants for their operations. The sampling technique used was the census, i.e. all students who received a grant as their capital. The total population was 33 groups.

Source And Data Collection Procedures

The data from this study was originated from two sources, namely by the primary data, i.e. data obtained directly from respondents through questionnaires and interviews and secondary data, i.e. data obtained through library and data from the organization that became the subject of research. Distribution of questionnaires was carried out directly to students by interview and they were guided in filling out the questionnaire. Filling the questionnaire was conducted on the spot and the results were immediately submitted.

Research Procedure

Implementation of this study involved two steps, namely: Preparation phase included a review of research literature and the preparation of questionnaires to be used as a means of collecting the data.

Implementation Research

After the correction of the respondent's answer from the data collected, it was then tested the validity and reliability of each

instrument prior to data processing.

Data Analysis Techniques

In this study, there were several stages of data analysis:

The first phase is causality test data. It was performed by testing the validity using Person correlation coefficient of each statement with a total value obtained. Then the correlation coefficient obtained from each of these statements was compared to the critical number r existing at the critical tables in accordance with the product moment r degrees of freedom and the level of significance. If the correlation coefficient is greater than the number of critical value r , then a declaration is considered valid (Santosa, 2000:277). Reliability test was done by comparing the coefficient alpha with a critical number r , if larger then it was reliable means of measurement items. Analyzing the effect of ability, learning goal orientation and locus of control on entrepreneurial achievement with the intervening variables locus of control and achievement motivation. Test equipment used was regression analysis technique with the help of the program SPSS 10:00.

Model Research

Conversion diagram into mathematical models, are as follows:

$$Y_1 = a_1X_1 + a_2X_2 + a_3X_3 + e_1$$

$$Y_1 + Y_2 = d_1 e_{2.7}$$

$$Y_3 = Y_2 + d_2 e_{3.4}$$

$$Y_3 = X_1 + a_4 + e_{3.1} c_1 Y_2$$

Where:

1. Self-efficacy (Y_1), achievement motivation (Y_2), entrepreneurial achievement (Y_3) as independent variables, while the dependent variable is the ability (X_1), the

orientation of the learning objectives (X_2), locus of control (X_3).

Path coefficients are standardized regression coefficients.

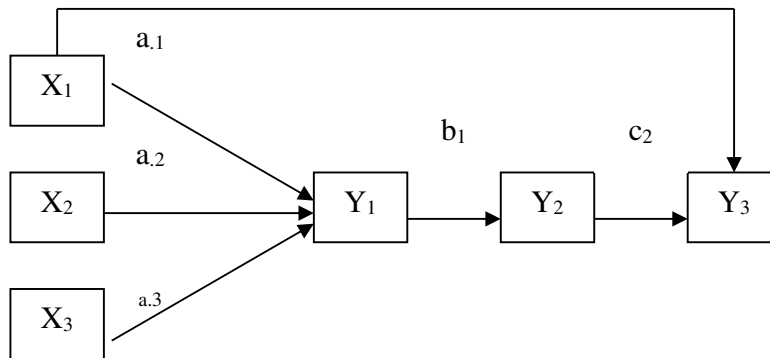


Figure 2. Research Model

Discussion

Results Of Validity And Reliability Tests

Validity means how far the preciseness and accuracy of measuring device in performing its measuring function. A test or measuring instrument can be stated as having high validity if the aforesaid instrument runs its measuring function, or providing the measuring outputs in conformance with the aim or objective of such measuring. A test producing data not relevant to the objective of measuring is said to be a test having low validity (Azwar, 200:5-6). Further, the validation process is actually not intended to carry out the validity test, but to carry out validation to the data interpretation obtained by a certain procedure (Cronbach, 1871, in Azwar, 2000:44).

Measuring validity under this research was carried out by correlating each item to the total scores, using the Spearman Correlation Technique. This technique was aimed to test

whether each item or part of statements was really capable of describing the factors to be measured or to know the internal consistency of each item of measuring instrument in measuring certain factor. This research had a limitation in testing the validity of the measuring instrument; therefore the thing to do was to measure the validity of the item.

Table 1. shows that the average variable of ability is 3.86, indicating that the students' ability when being measured is above the average. The average variable of Orientation of Learning Objective is 36.22, indicating that the students have a very good orientation on the learning objective. The average variable of locus of control is 28.56, indicating the tendency of external locus of control. The *self-efficacy* variable indicates the low average of 8.79. The variable of achievement motivation indicates the value above the average of 18.63. The variable of entrepreneurship success indicates a very good average of 5.66.

Table 1.
Descriptive Statistics

Variables	Mean	Standard Deviation
Ability (X ₁)	3.86	0.86
Orientation of Learning Objective(X ₂)	36.22	1.69
Locus Of Control (X ₃)	28.56	2.78
Self-Efficacy (Y ₁)	8.79	2.65
Achievement Motivation(Y ₂)	18.63	2.68
Entrepreneurial Performance(Y ₃)	5.66	0.99

Source: Processed Data

Hypotheses Testing

In order to know the relation patterns of research variables, 4 (four) hypotheses were be tested. These hypotheses were analyzed by seeing the magnitude of probability by using (5%.)

Hypothesis-1a: From the results of data processing, it is found out that the probability of $0.001 < 0.005$, then it can be stated that the influence between the ability variable and that of self-efficacy is significant. So, the hypothesis is proven.

Hypothesis-1b: From the results of data processing, it is found out that the probability of $0.241 > 0.005$, then it can be stated that the influence between the orientation of the learning objective and that of self-efficacy is not significant. So, the hypothesis is not proven.

Hypothesis-1c: From the results of data processing, it is found out that the probability of $0.467 > 0.005$, then it can be stated that the influence between the locus of control and that of self-efficacy is not significant. So, the hypothesis is not proven.

Hypothesis-2: From the results of data processing, it is found out that the probability of $0.003 < 0.005$, then it can be stated that the influence between the self-efficacy and that of achievement motivation is significant. So, the hypothesis is proven.

Hypothesis-3: From the results of data processing, it is found out that the probability of $0.002 < 0.005$, then it can be stated that the influence between the achievement motivation and that of entrepreneurship performance is significant. So, the hypothesis is proven.

Hypothesis-4: From the results of data processing, it is found out that the probability of $0.000 < 0.005$, then it can be stated that the influence between the capability and that of entrepreneurship performance is significant. So, the hypothesis is proven.

The magnitude of ability variable influence on self-efficacy is at the sum of 0.372, and the influence of variable of orientation of learning objective on self-efficacy is 0.234 whereas the influence of variable of locus of control on self-efficacy is 0.023. The ability variable has the biggest influence on the self-efficacy and significant. The variable of orientation on learning objective has the influence of 0.167, whereas variable of locus of control has negative and insignificant influence. The ability variable has the influence of 0.602 on the performance of entrepreneurship and significant. Variable of motivation to make achievement has the influence on the entrepreneurship performance at the sum of 0.118.

Relevance & Results

This study examines the success of students in Indonesia in conducting entrepreneurship. This research is an evaluation of both entrepreneurship programs implemented by the DIKTI (Higher Education Directorate in Indonesia) to be given an entrepreneurship programs in college students at Universities in Indonesia at semester two to six. The students are given the opportunity to develop the entrepreneurial talent by providing supporting funds for students receiving funding for their proposal. On the other hand, not all students obtaining the opportunity are successful in carrying out their business opportunities.

The results of this research reveal that individual variable characteristic that significantly affects self-efficacy and entrepren-

eurship achievement is ability, while learning goal orientation and locus of control have no significant effect on self-efficacy. Self-efficacy also has significant effect on achievement motivation & achievement motivation has significant effect on entrepreneurship achievement.

Conclusions

After analyzing the results of research and testing of such hypotheses that have been described previously, this section will describe the conclusions of the analysis and testing hypotheses.

1. Hypothesis Ia - That the variables of ability, locus of control influence the learning goal orientation and provide significant impact on self-efficacy. The hypothesis is proven.
2. Hypothesis Ib - In the data processing it is known that the probability is $> .005$, we can conclude that the influence of variables of learning goal orientation and self-efficacy is not significant. The hypothesis is not proven.
3. Hypothesis Ic - In the data processing the probability is > 0.005 , we can conclude that the influence of variables of locus of control and self-efficacy are not significant. The hypothesis is not proven.
4. Hypothesis 2 - That self-efficacy significantly influences achievement motivation, it can be said that the influence of variables of self-efficacy and achievement motivation are significant. The hypothesis is proven.
5. Hypothesis 4 - Achievement motivation significantly influences entrepreneurial achievement, we can conclude that entrepreneurial performance and

achievement motivation are significant. The hypothesis is proven.

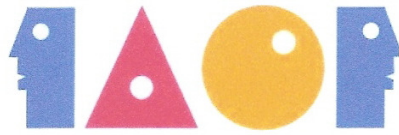
6. Hypothesis 5 - That the ability significantly affects the entrepreneurial achievement. In the data processing it is known that the probability of $0.000 < 0.005$, then it can be said that influences significantly the ability of the entrepreneurial performance. The hypothesis is proven.

Suggestions

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ENTREPRENEURIAL ORIENTATION AND ORGANIZATIONAL LEARNING ON SMES' INNOVATION

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Abstract

Entrepreneurial orientation (EO) is a driver of firms' innovation. The phenomenon of EO as a prerequisite for innovation has become a central focus of corporate entrepreneurship literature. Despite an abundance of research suggesting that innovation capability contributes to SMEs' performance, little is known how dimensions of EO specifically influence SMEs' innovation. Furthermore, although prior research has examined various factors that influence the EO–innovation relationship, few studies have address views how organizational learning influences the EO-innovation relationship in the SMEs context. Based on the literature review, our study attempts to fill this gap by postulating that entrepreneurial innovativeness, proactiveness and risk-taking are related to SMEs' innovation and that organizational learning positively moderates the EO–innovation relationships.

Keywords: Entrepreneurial orientation, organizational learning, innovation, SMEs

Introduction

Due to the vital role which SMEs play in economies and technological development, issues of SMEs' innovation are increasingly explored in the SME literature (Mueller et al., 2013). The dimensions of entrepreneurial orientation include innovativeness, risktaking and proactiveness behaviors. These key elements represent a directional approach for a firm's inclination to connect entrepreneurial actions with its growth. SMEs generally face with the significant resource constraint.

Unlike large companies, the relatively smaller size of SME's allows them to react to market changes expeditiously through innovative initiatives. SMEs have the potential to be able to facilitate innovative activities with proper strategies (Prajogo & McDermott 2014; Tang & Hull, 2012). To survive in today's competitive business environment, enterprises need to initiate new products and services; and sustain their competitiveness through innovation (Kreiser et al., 2010). Constrained by limited firm resources, SMEs' growth depends on their ability to adopt right strategies for

innovation (Mbizi et al., 2013; Mazzarol et al., 2014). Despite an abundance of research suggesting that innovation contributes to SMEs' performance, little is known regarding the extent to which salient dimensions of EO may influence SMEs' innovation outcomes.

Entrepreneurship is best studied through the understanding of its key elements such as originality, proactiveness and daring attitudes. Organizational learning strengthens the impact of the entrepreneurial orientation on firms' positive forces of growth, especially on SMEs innovation. Strategic management of SMEs through organizational learning can lead to improved and mobilized intellectual resources for effective innovation.

Prior research suggests that organizational learning influences firms' innovation performance (Alegre & Chiva, 2013). Innovation can be seen as the result of an organizational learning process which directs firms toward effectiveness, efficiency or breakthrough outcomes. Organizational learning is a dynamic process which enables firms to adapt quickly to the environment with advanced technologies and knowledge reflecting marketing changes. This process includes the application of new knowledge and skills with innovative approaches. However, few studies have expressly examined how organizational learning influences the EO-innovation relationship in the SMEs context. This study attempts to fill these research gaps by postulating that entrepreneurial innovativeness, entrepreneurial proactiveness and entrepreneurial risk-taking are positively related SMEs' innovation. Organizational learning, in turn, positively moderates EO-innovation relationship. This paper proceeds by first elaborating theoretical arguments and developing hypotheses. We then proceed with a discussion of the implication and conclusion.

Literature Review and Development of Proposition

Entrepreneurial Innovativeness and SMEs' Innovation

With respect to entrepreneurial orientation, innovativeness is defined as the capabilities and intention to initiate new products and services. Mbizi et al. (2013) define innovativeness of firms and individual employees as their capability to harness creativity and to execute that creativity in the face of challenges during the course of improving processes, procedures and products. As outlined in the definition, innovativeness is crucial for a firm for upgrading or radical changes on existing products and services. For some researchers, upgrading and innovativeness are different aspects of business development. For example, Kaplinsky and Morris (2003) consider innovation as the process through which a firm ensures that the product and processes in use are subjected to continuous improvement. Upgrading can also be equated as innovation only when it is present in a relevant context. Giuliani et al. (2003) alternatively describe upgrading as a function of innovativeness that is used to increase value to the firm or brand, often achieved by entering new markets, sectors and niches and generating new product/service functions.

Our study argues that decision to go for innovation is often based on entrepreneurial innovativeness of SMEs, although these firms often calculate factors that bring about the variation in products, services and processes. Four different directions those are available to firms to follow for innovativeness, including process, product, chain or functional upgrading (Kaplinsky & Morris, 2003). Humphrey and Schmitz (2003) argue that these categories are important contributions to the international debate over on innovativeness

and have gained recognition in the international sphere rapidly. Researchers have believed that technological innovation is equivalent to up-gradation within a firm. In this context, Habaradas (2008), for example, suggests that technological innovativeness in a firm consists of many steps, such as technological, scientific and commercial steps. SMEs with high entrepreneurial innovativeness will invest with organizational and financial resources in each of these steps leading the firm to being innovative. The most important activities involved in these steps are critical for actual delivery on research and development, training of staff, setting up of tooling, sales and marketing which eventually contribute to innovation in SMEs.

Innovation can be described as creative application of traits held suitable in action to business development (Lyons et al., 2007). It would therefore be safe to say that innovativeness is the process of generating original concepts by using methodologies that are generally used to place creative ideas in action. Roberts (1999) proves a direct correlation between innovation and profitability (Lyons et al., 2007). It has been demonstrated that the early and fast introduction of innovation in the enterprise brings in highest possible market returns since the firm becomes the first one to introduce a product or good into the market (Hitt et al., 2001).

Innovation is important for SMEs to earn monopoly profit, although it is for a short term duration and is valid only till a competitor arrives in the scene. Competitive advantage is a direct outcome of innovation between competitor brands and hence, innovativeness is close to being the lifeline of a firm's strategy and therefore, an integral part of entrepreneurial orientation (Hamel, 2000). SMEs with high entrepreneurial innovativeness can hit the jackpot if their

entrepreneurial orientation is driven by a thrust to innovate at each and every step of the work. It has positive effect on not only the market performance but also on the brand's long term reputation helping firms to retain customers after the initial product breakthrough. Out of this discussion the following proposition emerges:

Proposition 1: Entrepreneurial Innovativeness is positively related to SMEs' Innovation.

Entrepreneurial Risk-taking and SMEs' Innovation

Entrepreneurial risk taking is another key dimension of entrepreneurial orientation which is embedded on SMEs' operational activities substantially. Risk taking is a combination of bold intension and activities that a firm takes to improve its business returns and effectively increase the growth. These operations include venturing into unknown markets, investments in ventures that have uncertain outcomes and borrowing large quantities from the market (Baker & Sinkula, 2009). Risk taking can be defined as management's willingness to obligate significant resources to seek out opportunities that have both a chance of failure and the opportunity for success (Eggers et al., 2013; Nasution et al, 2011; Ireland et al, 2006).

Generally firms in the market which are built on EO are often classified or characterized by their risk taking potential or strategies. These would include taking on large debts or making large commitments of resources towards projects that secure high market returns by making the most of opportunities in the marketplace. In short, risk taking is a measure of the firm's ability to venture into the unknown and break away from the conventional path. Hughes & Morgan (2007) suggest that EO encompasses the

undertaking of risks necessary to secure sustainable growth in the ongoing competitive markets. McGrath (2001) elaborates this view through his study and argues that following conventional paths leads to high mean performance while risk taking has variable outcomes for businesses and have potential for long term profitability. Dess et al. (2011) and Tang et al. (2014) note that entrepreneurial risk taking has a positive influence on organization and business growth. Risk taking and innovation are relatable aspects of EO as they have a positive impact on the growth of a business by virtue of improved brand awareness in the market and introduction of competition in the processes. Crucial factors in innovation that receive a boost through risk taking are product and services innovation which according to Hoonsopon and Ruenrom (2012) have a positive impact on the competitive advantage of SMEs. SMEs with high entrepreneurial risk-taking can create opportunities to contribute to innovative outcomes and provide benefits to their customers as well as enhance their cost advantage over competitors by offering new services and products at low costs in suitable markets (Zhou et al., 2005; Hoonsopon & Ruenrom, 2012). The following proposition then emerges:

Proposition 2: Entrepreneurial Risk-taking is positively related to SMEs' Innovation.

Entrepreneurial Proactiveness and SMEs' Innovation

The level of entrepreneurial proactiveness in a firm often decides the extent to which it will survive in a changing market, especially for SMEs which have limited resources and R&D capability to sustainably compete with large companies. Proactiveness is often defined as opportunity seeking and exploitation of resources that can be a source

of innovation, competitive advantage and first-mover benefits in the marketplace (Eggers et al., 2013; Ireland et al., 2006). A forward looking approach and a positive mindset can help the firm use existing techniques or adopt advanced knowledge to overcome impending change in the market place.

However, a firm has maximum chances of enjoying first mover benefits. However for a firm to maximize its chance of enjoying first mover benefit, it needs to combine proactiveness with innovativeness and come up with a novel solution that is brand new to the market place and therefore, accepted as a breakthrough. Entrepreneurial orientation rests on the capability of a firm to use its existing resources to introduce new products or services in the marketplace or redefine its investments and develop processes and products that are completely new to the marketplace. Proactiveness has the capacity to not just project the firm into the future market but also shape the environment in the market and give new edge to existing competitive capabilities. Capitalizing in emerging markets is the main requisite of the spirit of proactiveness (Tang & Hull, 2012). Proactiveness is expected to be significant in securing superior firm performance (Baker & Sinkula, 2009). It is easier for them to target premium markets and extract first entrant advantages like skimming the market much ahead of their competitors (Tang & Hull, 2012; Lumpkin & Dess, 2001).

Conventionally, innovations are classified as radical or incremental, depending upon the degree of novelty in their applications (Nieto et al., 2013). Studies on innovation management and the amount of proactiveness show that firms which succeed in balancing their existing expertise to create improved incremental innovations by using proactiveness are more prone to experiencing

market success, while they are required to simultaneously develop new technologies to bring about major breakthroughs (Chang et al., 2011). Needless to say that in order to fulfil this requisite, a firm must be able to balance internal dilemmas between innovation pathways against challenges related to demands of contradictory nature on the firm by the external market environment that creates external pressure on the firm (Jansen et al., 2006). A firm therefore is able to learn the art of striking the balance between radical and incremental innovative actions to accomplish superior sustainable performances. A firm that is unable to strike this balance will end up becoming mediocre and uncompetitive in the market (Chang et al., 2011).

Entrepreneurial proactiveness can be a drive for innovativeness since SMEs with this orientation tend to start innovation protocols to meet the emerging customers or market needs (Nieto et al., 2013). The approach utilizes original designs, new markets creation, and new channels of distribution which are developed through due diligence and proactiveness. Alternatively, incremental innovations can be derived by exploiting current capabilities alongside seeking continuous upgradations as a result of incremental innovation that generate consistent and positive returns (Nieto et al., 2013). The firms expand on skills and the knowledge which exists currently. They also enhance the recognised designs and expand on the existing products and associated services, which increase the efficiency of existing distribution channels (Chang & Hughes, 2012). Hence, it is only natural that incremental innovations build on existing knowledge and organization learning frameworks and bring into focus existing skills, structures and processes (Jansen et al., 2006).

It is important to note here that product and service innovations are normally cate-

gorised by closeness to novel or existing technologies, functions and product features; customers, market segments and the market routes (Chang & Hughes, 2012). Enhancing product and service innovations therefore must be focused upon original and emerging customer needs in new, creative or rising markets through the use of novel technologies, features and functions which are significantly separate from existing processes and products. Likewise, incremental innovations of both products and services meet current market needs and those of customers with enhancements in modern technologies.

Innovations completely rely on using an inventive and proactive approach that is considered through prototyping, tests, research and discovery. SMEs with high entrepreneurial proactiveness tend to proactively bring in a change in the way of operating to entry into unknown markets and introduce new services and products by applying new technologies and information in order to improve the total performance of the firm (Nieto et al., 2013). As a result, such SMEs are potentially able to generate more innovation for the market than those lacking proactiveness. Based on the foregoing, we thus hypothesize:

Proposition 3: Entrepreneurial Proactiveness is positively related to SMEs' Innovation.

Organizational Learning and SMEs' Innovation

Prior studies suggest that organizational learning is an integrated combination of a number of organizational activities including knowledge acquisition and information sharing that consciously influence firms' innovation performance (Sakiet al., 2013). Firms' innovation relies on a steady stream of organizational learning in the firm that is

inspired by entrepreneurial orientation. Organizational learning allows the firm to make strategic moves by facilitating innovative activities and creation (Sakiet al., 2013). Organizational learning and entrepreneurial orientation have a close relationship because organizational learning sits at the roots of firms' innovation and entrepreneurial ventures. Organizational learning has a positive impact on innovation by preventing repetition of existing protocols (Renko et al., 2009 Avolonitis & Salavou, 2007). It is thus important to note that future profit streams in entrepreneurial firms from existing operations are uncertain and therefore businesses need to use organizational learning to maintain a search for new opportunities because of the ever shortening life cycle of products in today's fiercely competitive environments (Hamel, 2000). Empirical studies undertaken in this regard support the view that organizational learning has a positive impact on entrepreneurial firms and performance (Zahra, 2012; Eggers et al., 2013).

Organizational learning also has a positive impact on the quality of performance (Tang & Hull, 2012). The intensification of pioneering entrepreneurship is a significant purpose for any new enterprise. This increases its receptiveness to a global and varying market settings. Today's firms cannot survive fast change and novelty which they are compelled to experience if they fail to uphold entrepreneur's skill (Eggers et al., 2013). SMEs invariably lack the competence, market control and resources of other big firms. To a great extent, their success depends on their innovative behavior and the ability to formulate competitive strategies, implement them and respond to the market challenges posed by the changes (Mbizi et al., 2013).

Organizational learning form SMEs is pretty direct and impactful requisition since there may be less focus on innovation and

more focus on expansion and enhancement of services in these firms. From SMEs' perspective, internationalization is an entrepreneurial activity and entering new geographic markets on a large scale is to be regarded as equivalent to adopting new practices, up-gradations and implementing organizational learning (Johnson Jr. et al., 2013). Prior research suggests that SMEs differ from larger enterprises because of differences in their leadership styles, internal operations, organizational structures, existing assets, and environmental reaction (Mbizi et al., 2013). SMEs often understand and try to emphasize innovation to achieve high growth with exciting variances in a given period of time. However, failure rate can be high in the innovation phase due to high uncertainty, risk taking and chaotic factors if organizational learning is not integrated in the process (Mueller et al., 2013). Appropriate organizational learning cultivates essential firm capabilities for innovation (Chiva et al., 2013) and it increases SMEs' ability to sense new opportunities in products and services of innovation (Maes & Sels, 2013).

Oke et al. (2007) suggest that SMEs are more engaged in creating product and service innovations based upon important lessons derived from organizational learning and previous innovation drives (Saki et al., 2013). As is well known, innovations are aimed at the creation and commercialization of improved products and services, in a way so as to meet demands of current customers and markets (Mueller et al., 2013). Such innovations have successful outcomes which are known to customers and firm builders and therefore have a low risk capability.

Organizational learning is known to travel on a trajectory. Organizational strategists build upon previous experience, core competencies, organizational learning, with effective linkages to the market and field

knowledge (Kollmann & Stöckmann, 2014). There is no doubt that in SMEs' operating today, economies of scale and scope increase the firm's profit margins greatly, and directly affect operational efficiency and profitability. SMEs are known to hold the gift of experience over new entrepreneurs and as they apply their knowledge and new ways of learning in order produce extensions from present product lines. SMEs must keep in mind that effectiveness of innovation might be influenced by organizational learning curve. In addition, innovations are presumed to enhance the life cycle of the SME's offerings as too many resources are not required and profit gains are observed within a very short duration of time (Mueller et al., 2013). Out of this discussion the following proposition emerges:

Proposition 4: Organizational learning positively moderates the relationship between Entrepreneurial Innovativeness and SMEs' Innovation.

Proposition 5: Organizational learning positively moderates the relationship between Entrepreneurial Proactiveness and SMEs' Innovation.

Proposition 6: Organizational learning positively moderates the relationship between Entrepreneurial Risk-taking and SMEs' Innovation.

Figure 1 illustrates the expected relationships that form the basis of the propositions and reviews the extant literature on the construct in relation to the conceptual framework.

Discussion

Entrepreneurial orientation acts as the fundamental poise of a firm which many SMEs have actually been able to adopt. Our

study contributes to the literature of SME strategy management with analysis of the strategic effect of entrepreneurial orientation on firm innovation. SMEs' strategic development of entrepreneurial orientation can effectively increase their innovation capabilities. We address the unexplored issues in the literature vis-a-vis the three dimensions of the entrepreneurial orientation essential for SMEs in terms of innovation.

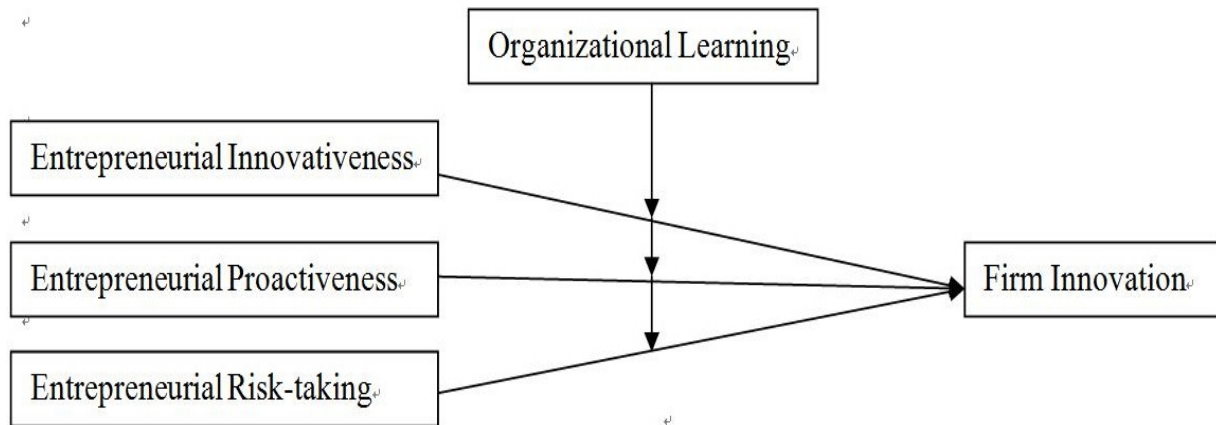
Entrepreneurial risk-taking orientation is applied to explore opportunities associated with innovation for the business expansion. SMEs' initiative for testing and introducing the innovative products or service to new markets requires a critical step of strategic risk-taking. The dynamic strategy based on the entrepreneurial proactiveness is a significant drive of SME innovation. With entrepreneurial innovativeness embedded in the entrepreneurial process, SMEs' focus will be on entrepreneurial course of action for actual innovation. Although the entrepreneurial orientation is common to all ventures, SMEs adopting the approaches by linking three aspects of EO with innovation are able to create unique opportunities for their survival and growth. The extent to which entrepreneurs and SMEs utilize innovation determines the extent to which they will succeed or even fail.

Our study also contributes to the literature of SME innovation by exploring the moderating effect of organizational learning in the relationships between innovation and entrepreneurial orientation of SMEs, which is rarely addressed by previous studies. The SMEs intending to embrace innovation and raise their productivity and survival odds must be able to be ahead of the changing markets by learning advanced technologies and knowledge, combining and utilizing both external and internal resources. SMEs should be open to new information, advanced

technologies and knowledge in order to be able to indulge in innovation and sustain their competitive advantage in the market. Their

survival and growth critically depend on their effective organizational learning to overcome their limited resources for innovation.

Figure 1. The proposed framework for Entrepreneurial Orientation and SMEs' Innovation



Organizational learning plays a propelling role in an organization forward to achieve SMEs' goals of creativity and innovation. As one may say survival of the fittest applies even in case of entrepreneurial orientation and SME innovation, which is particularly applicable in a competitive market. Product differentiation and market penetration are two key elements of competitive advantage. Constant learning for innovation is the only way-out. Organizational learning allows SMEs to identify the new trend of customer demands and take a new perspective to business development and the process of innovative entrepreneurship. To add to this mix, the role of SMEs in innovation and economic development has grown.

economic behavior. The entrepreneurial strategy conducted by entrepreneurship is a combination of internal and external factors that are influencing the business at a certain point of time. External factors that affect companies and influence their individual entrepreneurship strategies include competition, technological turbulence and demand uncertainty. Due to these changing external factors, firms must constantly react to the dynamic challenges emanating from the markets, build competitive advantages and sustain their business for the future through organizational learning, and rely on new patterns experienced in the business development of SME entrepreneurship.

Conclusion

Entrepreneurial orientation is a process that results in destruction of old business practices and leads to the establishment of new, innovative, risk-taking patterns of business development that secures a firm's

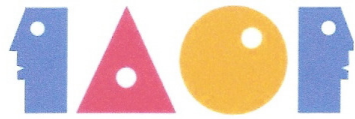
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An Editorial Notice: This article replaces an article previously published in Volume 7 No.3, pp 65-75, in which there are errors in Figure 1, occurring in the publication process of the journal. We apologize for any inconvenience.



A STUDY OF THE APPLICATION OF COMPETITIVE DYNAMICS THEORY
INTEGRATED WITH AHP - A CASE STUDY OF
TAIWAN'S LISTED AUTOMAKERS

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Abstract

This study constructed the Competitive Dynamics AHP Model (CDAHPM), and integrated multiple resources to measure resource similarity, as to facilitate the inter-organizational competition analysis. This study integrated different resources and incorporating them into the CDAHPM resource similarity computation according to their priorities to facilitate the objective resource analysis. By applying the Analytic Hierarchy Process (AHP), the CDAHPM constructs different resources and criteria before measuring the priority sequence and weights of the resources and criteria. In the empirical study of Taiwan's listed automakers, three different resources were integrated to develop the resource similarity, which was analyzed by CDAHPM. Moreover, strategic suggestions for various companies were proposed. Regarding the construction of CDAHPM, for single or comprehensive resource analysis, there are differences in competitor perceptions, predicted actions or responses with traditional competitive dynamics. No past studies have integrated multiple resources to conduct the competitive dynamics analysis. This study proposed a new model for the computation of resource similarity in the competitive dynamics analysis.

Keywords: Competitive Dynamics, AHP, CDAHPM

Introduction

Strategic planning is very important for enterprises in a competitive environment, and it requires subtle and correct perception and analysis of the competitors. Many studies have proposed different aspects of corporate resources. As the data evaluation in different resource aspects can produce different strategic judgments, the establishment and analysis of an integrated resource similarity to determine the right strategy is a research priority.

Past studies have suggested that resources can be presented in different forms, such as human resources (Schuler and Jackson, 1987), strategic assets (Amit and Schoemaker, 1993), knowledge-based capabilities (Teece et al., 1994), and discussed the impact of different resources on the company from five dimensions including ability, knowledge assets, organizational assets, goodwill assets, tangible assets and a variety of resource items (Jeremy, 2005). These studies have enhanced the importance of the impact of the corporate resources on its strategy and marketability with the same meaning, and explained the variety of aspects of resources. The single resource aspect evaluation and analysis can produce different competitors, thereby affecting strategy formulation.

Based on literature review, this study finds that the distribution of various resources of the company can be known by current assets and fixed assets (Hall's, 1992; Jeremy, 2005). The current assets and fixed assets are company resources (John and David, 2012). In the generation of different resources and rules, the application of AHP method can systematize the complex problems of decision-making with multiple evaluation rules by decomposing them at different levels and quantifying the results for integrated

evaluation. Hence, the appropriate options can be provided for the decision-makers. By applying the AHP, the CDAHPM constructs different resources and criteria before measuring the priority sequence and weight of the resources and criteria, in order to summarize different data of resource similarity for analysis and comparison.

Differ from the competitive dynamics analysis model of the market commonality and resource similarity, different resources may be not the same importance. This study calculates the resource similarity of different resource aspects, and applies the CDAHPM integrated with current assets, fixed assets, and sales locations. Finally, regarding the case study, this study uses Taiwan's four listed automakers as examples, and applies the CDAHPM to establish the different criteria of resource, and calculated the resource and criteria weights for the four automakers. The measurement and analysis of resource similarity are also conducted. Based on resource similarity, different weights affect the resource heterogeneity, strategic consideration, and priority sequence. Competitor images are established for evaluating and predicting the competitors' the market, resources and weights. According to the analysis results, in the resources of current assets, fixed assets, and sales locations differ from the basic competitive dynamics theory the single resource evaluation that will generate different major competitors, the CDAHPM can consider the strategic formulation by integrating different resources.

Cheng (1996) argued that the consideration of using resource similarity measured by competitive dynamics has potential problems, and thus other resources may be taken into consideration. This is the focus of the present study. The proposed CDAHPM integrates different resources in the description of the competitor images. When

analyzing the competitors, besides understanding the market and resource, it can bring an understanding to the weights of different resources.

The remainder of this paper is organized as follows. Section 2 summarizes the studies on competitive dynamics, Resource-based theory (RBT), AHP theory, and different resources. Section 3 describes the research methodology, constructs different resources and criteria architecture, and proposes the CDAHMPM. Section 4 uses Taiwan's automobile industry as an example, and applies the CDAHMPM on data analysis and the description of the locations of competitors of the cases, in order to illustrate the analysis of competitors. Section 5 offers conclusions and suggestions, and highlights the contributions of this study on solving the problem of similarity of multiple resources by using the CDAHMPM.

Literature Review

Regarding the evaluation of the market commonality and resource similarity proposed by the competitive dynamics theory, past studies often adopt the multiple competition in the analysis of competitors (Karnani and Wernerfelt, 1985; Gimeno, 1994; Smith and Wilson, 1995) in order to emphasize the importance of market share in the evaluation of corporate strategies. Some studies apply the RBT (Barney, 1991; Peteraf, 1993; Conner, 1994) to distinguish the enterprises by strategy or resource. However, these studies mostly focus on market or internal operations of the enterprises for evaluation. Some scholars (Amit and Schoemaker, 1993; Poter, 1991) underlined the evaluation balancing the external market and the internal resources. The competitive dynamics theory (Chen, 1996, 2007) is to evaluate the objective competitors by the perceptions of the focus manufacturer. The theory is confirmed by the

perception, competitor image analysis, attack and response in the case of airlines in the U.S. Similarly, in the study on similarity characteristics (Tversky, 1977), Tversky suggested that commonly accepted symmetry axiom underlying the metric distance function is not valid in capturing the concept of similarity, i.e., $d(a,b) \neq d(b,a)$. Statements of similarity are directional and depend on which element of the comparison is the "subject" and which the "referent". To illustrate this concept, Tversky further pointed out that "A is like B" is not the same as "B is like A". This echoes that the focus manufacturer explained by the competitive dynamics can evaluate its competitors according to market commonality and resource similarity.

RBT

The core concept of RBT is to follow "distinctive competence" proposed by the "heterogeneous resource" proposed by strategic management scholars (Selznick, 1997; Chandler, 1962, 1977; Ansoff, 1965; Barnard, 1970; Andrew, 1971). According to (Hoskisson, 1999), Barnard discussed in the book entitled *The Functions of the Executive* the company organization and operational mechanism by the management function and process based viewpoints to open the door to the research on strategic management.

The research on the strategic management of resource-based concepts includes the company aspect viewpoint of inside-out strategic analysis (Penrose, 1959; Wernerfelt, 1984; Rumelt, 1984; Barney, 1986b, 1991). The "industrial aspect" viewpoint of outside strategic consideration is discussed by (Porter, 1980, 1985, 1991). It is clear that many scholars have different views and ideas about the inside and outside environment concerning research topics on resources. However, the ultimate purpose of the studies is to discuss how the enterprises maximize their profits.

Therefore, in summary of the above RBT viewpoints from inside the company, the discussion on how the company maintains and improves competitive advantages differs from the viewpoint of industrial organizational economics; instead, it focuses on external environment.

Penrose (1959) mentioned in the book entitled *The Theory of the Growth of the Firm* that enterprises should have excellent resources and the distinctive competence to make effective use of these resources. Penrose is a pioneer of RBT (Montgomery, 1996). By extending the viewpoint of Penrose, (Wernerfelt, 1984) proposed the term of resource-based view (RBV) and the replacement of “product view” by “resource view” in his article concerning enterprise RBV. He argued that enterprise should make proper use of resources and strengthen resource efficiency in management, in order to build resource advantages that other competitors do not have for sustainable competitiveness. (Grant, 1991) was the first scholar to replace RBV with resource-based theory (RBT) and highlighted the significance of the theory in academic study. (Barney, 1986a) extended the viewpoint proposed by Wernerfelt, arguing that business performance does not come from the product market competition only but can be attributed to resources of different business backgrounds as the future values of different enterprises generated from different strategic resources are varied. Hence, when selecting strategy, enterprises should analyze the unique resources including technology and capability.

Regarding the definition and categorization of business resources, scholars have proposed different views. (Penrose, 1959) was the first scholar who regarded resource as the key factor affecting business behaviors. He considered the enterprise as the system of resource combinations and the enterprises

pursue business growth through effective use of internal resources. (Coyne, 1986) used the two categories of abilities of “having” and “doing” to describe the organizational resources. The “having” ability means that the enterprise has competitive advantages and defensive position in terms of the results of previous actions.

Legally speaking, it includes the ownership rights of the legal entity such as the intellectual property rights. The “doing” ability means that the ability in function including knowledge, technology, employee experience and other business related personnel (e.g., supplier, distributor). (Hamel and Prahalad, 1994) pointed out from the core expertise perspective that the core expertise in the long term comes from the current product price and performance. However, in the long term, it comes from the ability to launch products of lower cost in a more rapid way than the competitors. The future of the enterprises is the competition of core expertise, and thus, the enterprises should focus on the development, acquisition and layout of its core expertise, and also accumulate and concentrate the expertise on strategic key points. (Grant, 1991) argued that “resource” is the basis of corporate profitability and is the major source of organizational “abilities”.

RBT concerns about how to identify, clarify, cultivate and protect the core and unique resources of the organization. (Hill and Jones, 1992) pointed out that companies should promote the extraordinary ability to achieve better efficiency, quality, innovation and customer response for the application in the differentiation and cost-based strategy in order to complete value creation. The extraordinary ability mainly comes from organizational resources and the potential for using the resources. To summarize, resource is the basis to keep the competitiveness of the enterprises. These core resources allow the

enterprise to have better value creation activities and profits.

As mentioned above, many studies have argued that resources should be distinguished into tangible and intangible resources (Jeremy, 2005; Hall, 1992, 1993). The tangible resources include financial assets (Grant, 1991), physical assets (Grant, 1991), and public financial reports (Wyatt, 2002; Jeremy, 2005). In the same resource dimension, current assets and fixed assets are presentations of the tangible resources of the company. The current assets are studied in the study of company resource (Rauscher and Wheeler, 2012; Dong, Liu, Klein, 2012). The fixed assets is used to illustrate and analyze the resources of the company (Deepankar and Ramaa, 2013; Sheila and Javier, 2012; Allen and Lamont, 2011; Hu and Fang, 2010; Karen, 2009).

Competitive Dynamics.

The competitive dynamics is to measure and analyze competitors utilizing the market commonality and resource similarity by observing the competitors in two dimensions, including the market and resource, in order to understand the competition motivation, and compares their abilities and performance. Then, pre-judgment of the competition behavior and response are made to return to the competition analytic architecture for cycles. The competitor image uses the comparator to compare the market commonality, and resource similarity of the companies, indicating the locations of competitors in the twodimensional graphs. The locations in the graph also illustrate the corresponding relationships with the competitors to explore and predict the possibility of mutual competition strategy. Regarding the comparison of market and resource, market commonality is the stronger and more beneficial prediction in the prediction of competition behaviors and

response (Cheng, 1996, 2007).

Market commonality.

$$M_{ab} = \sum_{i=1}^{2000} [(P_{ai}/P_a) \times (P_{bi}/P_i)] \quad (1)$$

- M_{ab} = Market commonality that airline b has with the focal airline a;
- P_{ai} = Number of passengers served by a in route i;
- P_a = Number of passengers the served by a across all routes;
- P_{bi} = Number of passengers served by b on route i;
- P_i = Number of passengers served by all airlines in route i;
- i = A rout, among the top 2,000 routes, served by both a and b.

Eq. (1) measures the market commonality, which indicates the degree of commonality in the product market of the focus manufacturer and its competitors. A high degree of market commonality suggests that the two companies are more likely to be competitors. When the possibility of competition behavior is low, the competition response is more like to take place (Chen, 1996, 2007).

Resource significance.

$$T_{ij} = \sum_{m=1}^n [(A_{im}/A_i) \times (A_{jm}/A_m)] \quad (2)$$

- T_{ij} = Resource significance between airline i and j;
- A_{im} = the total number of m type aircraft operated by airline i;
- A_i = the total number of aircraft operated by airline i;
- A_{jm} = the total number of m type aircraft operated by airline j;
- A_m = the total number of m type aircraft operated by all airlines;

m = Types of aircraft operated by both airline i and airline j

Eq. (2) measures the resource similarity. The comparison of the available resources of the focus manufacturer and its competitors indicates the differences in resources and competition strategy. At a higher degree of resource similarity, the possibility of competition is low and the possibility of competition response is high (Chen, 1996, 2007). In brief, competitive dynamics measures the competitors in the market and resource, and illustrates the market commonality and resource similarity. The competition behaviors and responses may belong to the following situations (Chen, 1996):

Proposition 1a: The greater B's market commonality with A, the less likely A is to initiate an attack against B, or else being equal.

Proposition 1b: The greater A's market commonality with B, the more likely B is to respond to A's attack, or else being equal.

Proposition 2a: The greater B's resource similarity with A, the less likely A is to initiate an attack against B, or else being equal.

Proposition 2b: The greater A's resource similarity with B, the more likely B is to respond to A's attack, or else being equal.

AHP

The AHP, proposed by Saaty (1971), is a systematic analysis tool for applications in uncertainties and decision-making problems that involve multiple assessment criteria. The four major steps of AHP are as follows:

Step 1. Define the problem: regarding the problem under discussion, make further analysis and define the problem range.

Step 2. Establish a hierarchical architecture: hierarchical evaluation architecture is the main part to explore the interactions between various criteria. The hierarchical architecture can be developed from the topmost abstract indicators to clearer indicators through the detailed list.

Step 3. Compute the relative weight between criteria: establish the pairwise comparison matrix, compute the maximum eigenvalue, and obtain the maximum eigenvector to determine the relative weight of the various criteria through the standardized procedure.

Step 4. Consistency verification: to ensure the credibility of the computation results of Step 3 (i.e., the pairwise comparison matrix transitivity). The consistency index (C.I.) of the matrix is shown in Eq. (3).

$$C.I. = \lambda_{\max} - n / n - 1 \quad (3)$$

The computation of consistency ratio (C.R.) is as shown in Eq. (4). R.I value refers to Random index (R.I), which can be obtained from the table. If the C.R. value is smaller than 1, it means that the result is credible; otherwise, it means there is no consistency.

$$C.R = C.I / R.I \quad (4)$$

Method

The first step of this study is to conclude that the organizational resources can be presented in multiple dimensions as literature review suggests. With Taiwan's listed automakers as an example, three resources are selected: current assets (Rauscher and Wheeler, 2012; Dong, Liu, Klein, 2012), fixed assets (Deepankar and Ramaa, 2013;

Sheila and Javier, 2012; Allen and Lamont, 2011; Hu and Fang, 2010; Karen, 2009), and sales locations (Mondey et al., 1987; Taneja,

1989; Chen, 1996) to measure the CDAHMPM as shown in Figure 1.

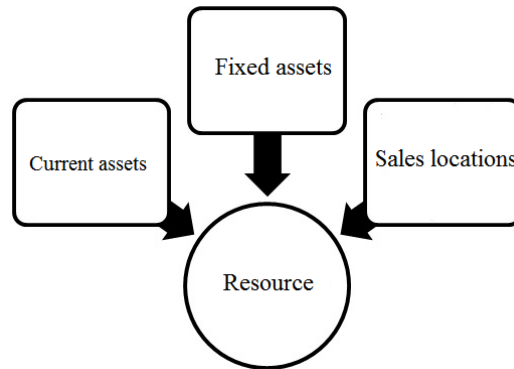


Figure 1. Resource similarity in different resources

The second step is to analyze the criteria of the resources. With four Taiwan's listed automobile industry as an example, the three resources (i.e., current assets, fixed assets, sales locations) are categorized into 10 criteria. The AHP is applied in the computation of the weight of the resources as shown in Figure 2.

The third step is to use the CDAHMPM to summarize different resource similarity. Eq. (5) combines different resources before the discussion of the competitors. The CDAHMPM resource similarity computation equation is as shown below:

$$S_{ij} = \sum_{k=1}^n W_k \times S_{ij}^k \quad (5)$$

S_{ij} = CDAHMPM resource similarity between company i and j;
 W_k = the weight of k^{th} resource;

S_{ij}^k = the similarity between k resource of i company with j company.

Differences from the traditional competitive dynamics theory; the CDAHMPM integrates different resources to obtain the resource similarity integrating multiple resources as shown in Figure 3. CDAHMPM.

The four automakers are in the business of automobile assembly and sales. The relevant data of the listed automakers in 2012 were used in this study. Based on previous literature, this study summarized the three resources and 10 criteria. Then, the

CDAHMPM was used to measure the resource similarity and establish the competitor images for competitor analysis, as well as the competition action and response pre-judgment.

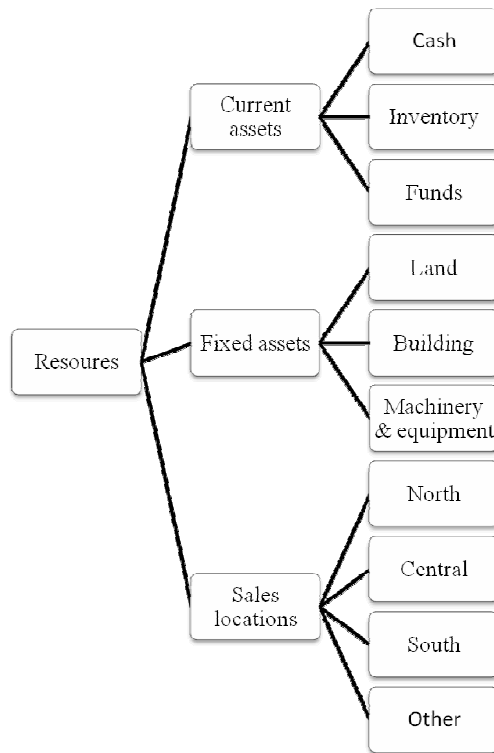


Figure 2. AHP resources and criteria of Taiwan’s listed automakers

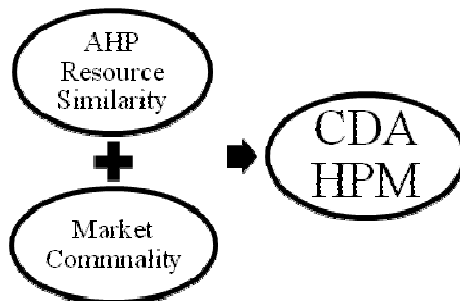


Figure 3. CDAHPM

Example

Competitive Dynamics

In the first step of the empirical study that method using Competitive Dynamics, regarding the listed automakers’ market commonality, this study referred to the definition of the market commonality proposed by

(Karnani and Wernerfelt, 1985; Gimeno,1994; Chen, 1996), and categorized the products into four types by the automobile license tax in Taiwan (emissions cc.) by (Pei and Ho, 2011). The market commonality calculated by applying Eq. (1) is as shown in Table 1. If Yulon Motor is regarded as the focus manufacturer: regarding market commonality data, Yulon Motor and Hotai Motor

Table 1. Market commonality

	2201 Yulon Motor	2204 China Motor	2206 Sanyang Industry	2207 Hotai Motor
2201 Yulon Motor		0.1324	0.0952	0.4776
2204 China Motor	0.3078		0.1175	0.4193
2206 Sanyang Industry	0.2966	0.1574		0.4169
2207 Hotai Motor	0.2574	0.0972	0.0721	

market commonality is 0.4776, followed by the market commonality of Yulon Motor and China Motor at 0.1324. The market commonality between Yulon Motor and Sanyang Industry is the lowest at 0.0952. In resource similarity, this study referred to the definition of (Mondey et al. 1987; Taneja, 1989; Chen, 1996), and used the differences in the number of sales locations to measure the listed auto-makers by four regions including north, central, south, and other. The sales location resource similarity computed by using Eq. (2) is as shown in Table 2. If Yulon Motor is regarded as the focus manufacturer, in terms of sales resource similarity, Yulon Motor and China Motor are highly similar as the resource similarity is 0.3489. The similarity

between Yulon Motor and Hotai Motor is 0.2582, and the similarity between Yulon Motor and Sanyang Industry is 0.1721, suggesting that the two are different in sales resource.

Eq. (1) is used to compute the market commonality as shown in Table 1, and the resource similarity as shown in Table 2. The competitor image is as described in Figure 4. The competitor image of the focus manufacturer Yulon Motor is on the top left, the competitor image of Sanyang Industry is on the bottom left. The competitor image of China Motor is on the top right and the competitor image of Hotai Motor is on the bottom right.

Table 2. Sales locations resource similarity

	2201 Yulon Motor	2204 China Motor	2206 Sanyang Industry	2207 Hotai Motor
2201 Yulon Motor		0.3489	0.1721	0.2582
2204 China Motor	0.2191		0.1734	0.2571
2206 Sanyang Industry	0.2178	0.3496		0.2575
2207 Hotai Motor	0.2178	0.3455	0.1717	

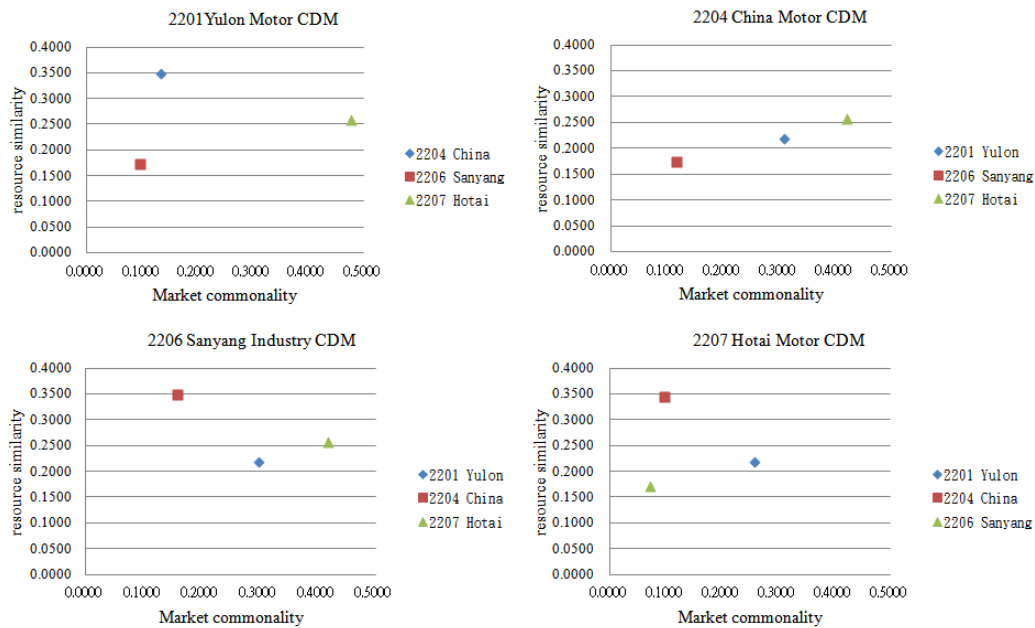


Figure 4. Competitor image

Take Yulon Motor competitor image in Figure 4 as an example, Yulon Motor and Hotai Motor have high product market commonality while the resource similarity between Yulon Motor and China Motor is high. Yulon Motor and Sanyang Industry are relatively different in market and resource, and their major competitor is Hotai Motor as perceived. Regarding competition attack and response, when the market commonality with the competitor is greater and the response is higher, the possibility of competition action is lower. When the resource similarity with the competitor is higher, the possibility of competition is lower and the response will be higher.

As suggested by (Cheng, 1996, 2007), since the airline fleet consists of types and number of aircrafts, each airline has different resource heterogeneity and endowment for resource similarity comparison. The traditional competitive dynamics theories usually compares in the single resource. When

applying the RBT, different resource may display different competitors' situations.

CDAHPM

For this research, develop the AHP is applied to three resources (i.e., current assets, fixed assets and sales locations) and 10 criteria to design the questionnaire. The questionnaires were distributed to 15 respondents in the listed automakers, and retrieved 14 samples. After eliminating two invalid samples with C.I. below 0.25, the results of the 12 samples are described as follows: dimension C.I. =0.0017, C.R. =0.0029, dimension criteria C.I. =0.027, 0.001, 0.065; C.R. =0.047, 0.001, 0.073, suggesting the consistency. The most important dimension is Current assets, followed by sales locations, and then fixed assets. By criteria, cash is the most important item of company's resources followed by sales location of Taiwan's north. The weights are as shown in Table 3.

By the computation of Eq. (5), the resource similarities are summarized as shown in Table 4.

The resource similarity of CDAHMPM is calculated based on Eq. (5). As shown in Table 4. The competitor images established by CDAHMPM are as shown in Figure 5 By combining Table 1 and Table 4.

According to Figure 5, Yulon Motor as the focus company, we can conclude to the results as follow:

(1) Originally, in the sales location resource

as shown in Table 2, the most similar competitor is China Motor. However, as shown in Figure 5 the most similar competitor is Hotai Motor, suggesting that major competitors differ in resources.

(2) Regarding the perception of the competitors, the CDAHMPM integrated with different resource similarity can display more explicit and accurate judgment.

(3) Sanyang Industry is the least market commonality and resource similarity, as shown in Figure 4. and Figure 5.

Table 3. CDAHMPM AHP analysis summary

Dimension	Criteria	Sequence	Sequence
	Weight	Weight	Weight
Current assets	Cash	0.6929	1
	Inventory	0.2125	2
	Funds	0.0945	3
Fixed assets	Land	0.6685	1
	Building	0.1516	3
	Machinery & equipment	0.1799	2
Sales locations	North	0.5190	1
	Central	0.2759	2
	South	0.1323	3
	Other	0.0728	4

Table 4. CDAHMPM resource similarity

	2201 Yulon Motor	2204 China Motor	2206 Sanyang Industry	2207 Hotai Motor
2201 Yulon Motor		0.2202	0.1395	0.3335
2204 China Motor	0.2890		0.1491	0.3113
2206 Sanyang Industry	0.2897	0.2342		0.3168
2207 Hotai Motor	0.2974	0.2168	0.1349	

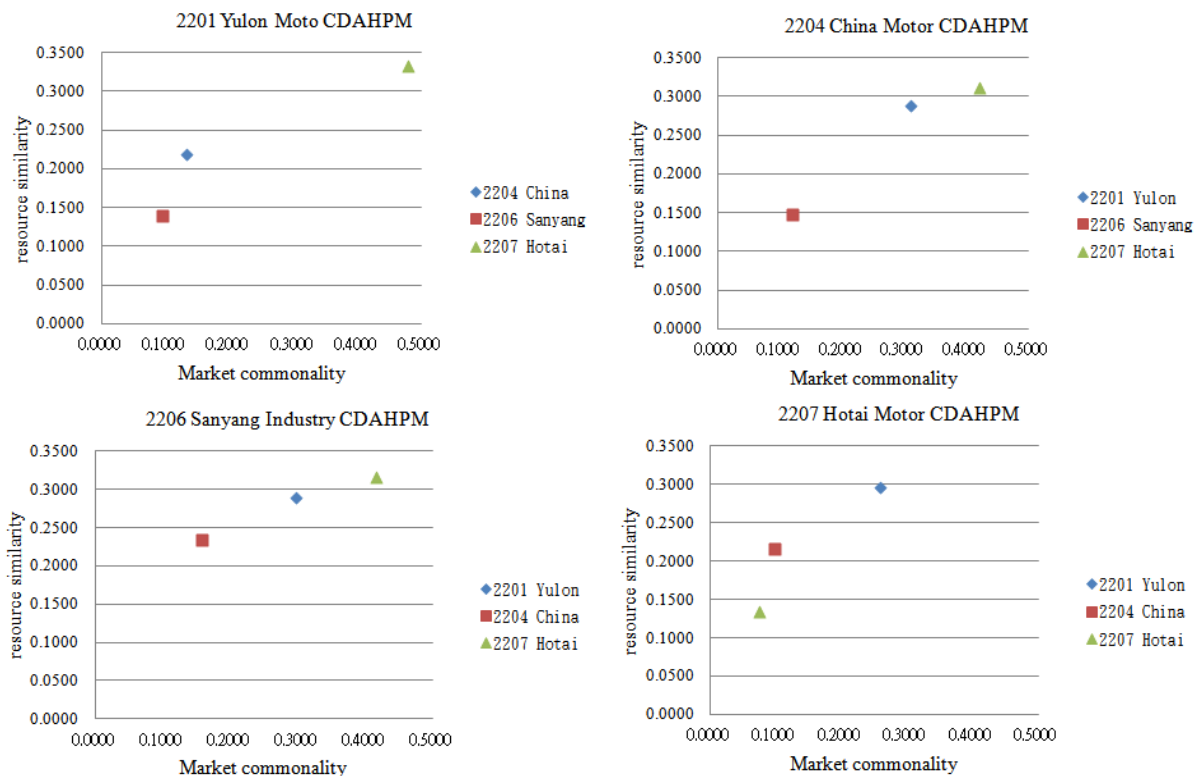


Figure 5. CDAHMPM competitor image

Discussion and Conclusion

In the two dimensions of market commonality and resource similarity, the competitive dynamics can analyze the competitor appearance and location through competitor image, and further illustrate and analyze the market commonality and resource similarity between the focus manufacturer and competitor. It can explain the competition behaviors and predict the response of the competitors in such an analysis framework.

Many studies have argued that resource has different dimensions. The integration of multiple resources in the study results in

relative relationships between competing companies. Therefore, the CDAHMPM integrates different resources to establish the competitor image. By considering market commonality, and different resources, the relative action or response strategy of competitors can be established in the prediction of competition behaviors and response.

This study displayed resources in different ways. Differ from traditional competitive dynamics theory; the CDAHMPM is a method that combines and summarizes multiple resources with considerations, including market commonality and resource similarity in strategic analysis.

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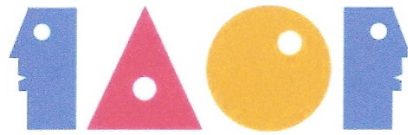
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INTEGRATED MARKETING COMMUNICATION, COLLABORATIVE MARKETING, AND GLOBAL BRAND BUILDING IN TAIWAN

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Abstract

This study proposes a model to examine the relationships among integrated marketing communication (IMC), collaborative marketing, and global brand building. We adopted a quantitative investigation. It delivered the questionnaire to top 50 brand value of corporations in Taiwan and then analyzes the questionnaire with multiple regression analysis. From the results, the major findings of this study are as the following: Firstly, integrated marketing communication and collaborative marketing have significantly impact on the global brand building. Secondly, collaborative marketing has a positive effect on global brand building. Thus, the findings provide criteria to managers for collaborative marketing and global brands building for Taiwanese corporations.

Keywords: integrated marketing communication (IMC), collaborative marketing, and global brand building.

Introduction

More and more Taiwanese corporations focus on building brand. For these firms, developing and building corporate identity or corporate branding has become highly urgent and desired. However, a multinational or global firms' characteristic and image have become the biggest factors affecting consumer choice between its products and services and other competitors (Melewar and Saunders, 2000). Moreover, enterprises measure a brand's strength partly from its intangible associations, supporting the consumer goods-derived theory on brand equity (Michell et al., 2001). In terms of the value of the brand, or brand equity, should be reflected in the market value of the firm and thus influence shareholder value (De Mortanges and Riel, 2003). Enterprises must increasingly focus on the relationships among consumers, customers, and stakeholders.

In Taiwan, firms have only few experiences in building global brand but also delay to build brand in the global market. Therefore, how to break the deadlocked situation is the most urgent issue to Taiwanese firms. For Taiwanese firms, the marketing communication decision has become far more complicated, because they essentially function in manufacture. Hence, in order to escape this quandary, several firms, including acer, Asus, and BenQ, began to recognize the importance of their own brands and switched their investments and endeavors toward high value-added activities such as research and development, product innovation, and brand building. Those firms that switched their business focus thus needed to engage in different marketing communications than they had used in the past. Therefore, Taiwanese firms should collaborate to develop unified images and cooperative strategy by integrated marketing communication.

According to academic literature, collaboration in IMC with corporations from similar or competing product sectors may offer significant advantages. IMC advocates the alignment of communications to deliver a flow of consistent messages about a product or service to meet a common set of communication objectives or support a single positioning (Pickton & Broderick, 2001). More consumers are becoming interested in the brands that firms make and market. Besides, the corporate brand should be the basis of the communication program and all other forms of communication should be integrated with this. However, Lin (2000) has presented the IMC model which provides a framework to review, operate, and evaluate the process and effectiveness of IMC. Moreover, Kitchen and Schultz (2001) have proposed the corporate umbrella to integrate business units for creating customer value, interactivity, and corporate brand. The primary mission of any enterprise is to sell its products or service. This means the purpose often achieved by collaborating with other enterprises. Therefore, firms can no longer be seen in isolation; they must be seen in the context of the total business and the associated key linkages of the business.

From the mentioned above, there is an important issue appeared. That is how to identify the appropriate approaches to build a successful global brand through IMC executed in the strategic alliance organization established from Taiwanese firms. This study takes 50 leading companies as an example to apply the conceptual framework. The case companies are selected because the brand value of these companies is the top 50 in Taiwan. Besides, these companies do not only participate in a lot of cross-functional projects in its business group, but try to establish individual brand, and so on.

Based on the background, the investigations of the research are: (1) to examine how the strategic alliance collaborative marketing through IMC and how collaborative marketing and IMC can help Taiwanese firms to build global brand; (2) to develop a framework which explore the relationships among the three dimensions of IMC, global brand building, and collaboration marketing. However, the research is ultimate to provide Taiwanese enterprises with the direction and criteria to implement IMC, collaborative marketing and global brand building strategies by a strategic alliance organization allied from Taiwanese firms.

Literature Review And Development Of Hypotheses

Integrated Marketing Communication

Integrated marketing communication (IMC) is defined as “a cross-functional process for creating and nourishing profitable relationships with customers and other stakeholders by strategically controlling or influencing all messages sent to these groups and encouraging data-driven, purposeful dialogue with them” (Duncan, 2002). Peltier, Schibrowsky and Schultz (2003) also propose IMC is a concept of marketing communication planning that recognizes the added value of using a comprehensive plan to evaluate the strategic roles of a variety of communication disciplines. It combines these principles to provide clear, consistent, and maximum communication impact (Schultz et al., 1993). Research on a national scale, and increasingly in the global domain, has shown that IMC is becoming more widespread within all types of marketing and advertising organizations.

Moreover, the age of internet explosion change agency-advertiser relationships and blur their functions (Bush and Bush 2000). IMC also can help companies to improve

communication quality to reach ISO 9000 standard. Therefore, IMC involves integration both horizontal (across various methods of communications) and vertical (from the marketer down through the marketing channel) (Bearden, 2001). Hence, global competition has increased the necessity for more integrated communication strategies (Lindberg-Repo and Gronroos, 2004). Pursuing this stream, the emergence of IMC supports the need for new holistic communication process models that show the company and the consumer perspectives as integral parts of a marketing communication (Lindberg-Repo, 2001). Furthermore, Lin (2000) proposed a new IMC model which includes six dimensions as below: 1. Awareness integration, 2. Unified image, 3. Data base integration, 4. Customer-based integration, 5. Stakeholder-based integration, 6. Evaluation integration. And with it, the model proposed by Lin (2000) helps tackle the three main issues of integrated communications, as follows: 1. organizations setting up effective communications; 2. organizations identifying their specific stakeholders; 3. organizations evaluating the effectiveness of their communications with their specific stakeholders.

Global Brand Building

Global brands are ones that have the following characteristics: (a) Extensive geographic reach: available in all major markets and most minor ones. (b) Perceived by consumers as global: awareness among consumers that the brand is sold throughout the world. (c) Uniform positioning and image worldwide: brands such as, INTEL, Nike, IBM, Gucci, McDonalds, Mercedes-Benz, Microsoft, Sony and so on (Craig and Douglas, 2000). In Taiwan, how to build a successful global brand is an urgent issue to solve for firms. But the Taiwanese firms almost are lack of experience on building global brand. TAITRA (Taiwan External

Trade Development Council) indicated that the major advantages of Taiwanese firms are advanced R&D technology and mature production system with complete supply-chain management. But the disadvantages are lack of international marketing human resource, funds and retail partners. The international marketing human resource is related to set up the abroad market and the funds are related to advertising promotion. Both affect whether building a successful global brand or not. Consequently and briefly, to build a global brand represented Taiwan is essential and urgent for Taiwanese corporations. Namely, alliances for brand building can be thought of as cooperative marketing activities involving short-term and or long-term combinations of two or more individual brands (Rao and Ruekert, 1994; Rao et al., 1999).

Moreover, Kitchen and Schultz (2001) proposed that integrated brands are measured on power, quality, price, and loyalty these four dimensions. Furthermore, enterprises not only collaborate on internal and external resource such as customers, partners, employees, channels...etc, to integrate brand building, but also on the value of the brand which the enterprises deliver to customers and stakeholders. In terms of the value of integrated brands should influence the market value of the enterprise and shareholder value (De Mortanges and Riel, 2003). It means that integrated branding is led by IMC and involves well planned and executed communication programs among all stakeholders (Schultz and Kitchen, 2000). Henderson et al. (2003) have argued that integrated brand building can create positive quality perceptions, clear meaning, and true recognition. The corporate umbrella concept is seen as a protective nurturing device sheltering the strategic business units and individual brands within its portfolio (Kitchen and Schultz, 2001). Moreover, they proposed an umbrella content with eight-section as follows:

interactivity, processes, global, intangible, customer value, alliances and affiliations, leading with communications, and corporate brand. Briefly, the strategic alliance should integrate the resources and benefits of each corporation to create a deep impression with customers because it communicates a mass of values to customers and stakeholders. Enterprises will realize it difficult to survive in competitive market without integration and a brand. However, to build a successful global brand means that the enterprises must collaborate to do marketing. Hence, this research extends the concept of corporate umbrella to establish the questionnaire base on the eight factors.

Since Vargo and Lusch (2004) argued in a recent paper that marketing is evolving toward a dynamic and evolutionary process—one that is based on a service-centered view. In keeping with this evolution, Vargo and Lusch (2004) suggest that (a) IMC should replace diverse, limited-focus promotional tools, and (b) brand management should be used for initiating and maintaining a continuing dialogue with the customers and for enhancing relationships. Similarly, the principle focus of IMC is the strategic coordination of the diverse communications activities employed by firms trying to develop strong brands (e.g. Schultz, 1993; Hutton, 1996). Therefore, IMC can help firms to build a unique and consistent brand to maintain the long-term relationship with customers. Hence, this research proposes a hypothesis according to relevant literatures of IMC and global brand building.

H1: The dimension of IMC will significantly impact on the dimension of global brand building.

Collaborative Marketing

Collaborative marketing is a popular

strategy for firms to share risks and exchange resources, access new markets, achieve economies of scale and obtain collaborative and competitive advantages (Dacin et al., 1997). The collaborative marketing may also serve as an exchange arrangement for partners to learn and obtain the technologies, skills and knowledge from each others that are not available within their own organizations. The relevant researches on collaborative marketing indicate these linkages between firms which provide technologies, entrepreneurial and managerial know-how and market access, to aid an export-oriented development strategy. However, it's very difficult to establish a successful and strong brand. To do branding will spend huge enterprise resource such as money, human resource and so on. In these circumstances, extended enterprise collaboration is a solution for individual companies, in association with other companies, academia, and government, to increase the success rate of transition to environmental fit through collaboration with other companies (Kogut, 1988). Therefore, the NGM team identified the groupings of strategic enablers for extended enterprise collaboration as follows: collaborative relationships, business systems, customer focus, core competencies, and legal and financial facilitators.

Base on concept and literatures above, the collaborative marketing operated by Taiwanese firms may provide opportunities for Taiwanese firms to build global brands. On this basis it is hypothesized that:

H2: The dimension of collaborative marketing will significantly impact on the dimension of global brand building.

In addition, the goal of collaborative marketing is to reach a closer integration and a better management of business relationships among parties including internal personnel,

business partners, and customers (Turban and King, 2002). Base on the principle of corporate umbrella, the collaborative marketing not only integrates the Taiwanese firms but also help build a brand represented Taiwan through integration marketing communication. Under this purpose of collaborative marketing, Bucklin and Sengupta (1993) have proposed that a co-marketing alliance is a lateral relationship among firms intended to amplify or build user awareness of the benefits that they offer. The motivation to form collaborative marketing often arises out of demand side considerations such as favorable consumer preferences for the products or service that come out of these alliances (Bucklin and Sengupta, 1993). Such collaboration also helps marketers expand into new markets by tapping their partners (Sherman, 1992).

Gebrekidan and Awuah (2002) have argued that collaboration involves inter-organizational cooperative strategies that require integrating skills and resources by the alliance partners to reach goals linked to the strategic objectives of the cooperating firms. In addition, collaboration involves sharing risks, exchanging resources, accessing new markets, achieving economies of scale and generating synergy and competitive advantages (Dacin et al., 1997). Collaboration, as well as optimizing the combined competencies of the partners to reach their goals, should also provide solutions to meet customer and stakeholder needs.

Caywood et al. (1991) generated a conceptual debate concerning integrated approaches to marketing communications. Michell et al. (2001) examined whether one hybrid form can successfully link elements of the marketing mix (price, quality, and advertising). Namely, the marketing strategies of collaboration, which are marketing communication, advertising, unified image and so on, involve building brand loyalty, lowering

customer price elasticity, and in general reducing competition. According to Williams (2001), the different departments must cooperate in all stages of strategy for IMC success. Then, useful cross-functional design is essential for IMC implementation (Petegrew, 2000). More and more enterprises emphasize these results on mutual interaction with key stakeholders and partners, with that; strategic alliance needs to integrate resources and its contact points. This typically lowers associated costs and investments, and facilitates communication and coordination (Lichtenthal and Eliaz, 2003). The advantages of marketing communications will disappear without the fine operation of strategic alliance. As well the brand represented Taiwan will not be built successfully. Concisely, integrated marketing communications and global brand building are important missions of strategic alliance. On this basis it is hypothesized that:

H3: The dimension of collaborative marketing will significantly impact on the dimension of integrated marketing communications.

Methodology

Sampling

We deliver questionnaires to top 50 Taiwanese corporations. The ranking of Taiwanese is evaluated by brand value. The target populations are aimed at level of manager such as CEO, chairman, general manager, vice general manager, director and chief of marketing, public relation and sales department. Hence, the target populations are the high and middle level managers including executives, strategic staff, employees and department of marketing, public relation and sales of these fifty corporations. Finally, there are total 215 copies of questionnaire delivered to the populations.

Measuring Tools

The measurement instrument was designed based on various previous studies. All the questionnaire items were measured on a five point scale. Respondents were asked to indicate their level of agreement toward each statement, from 1 (strongly disagree) to 5 (strongly agree).

Integrated Marketing Communication. This research designed eighteen items on six factors of integrated marketing communication proposed from Lin (2000) advice. All the factor loading of each factor as awareness integration, image integration, database integration, customer-based integration, stakeholder-based integration and evaluation integration are greater than 0.5 respectively but there are only ten items with high significant factor loading. With regarding to the reliability analysis, the original scale used in the research has high reliabilities (range from 0.91 to 0.93) for all these dimensions. It also presents the internal consistency for the factors and items of integrated marketing communication.

Collaborative Marketing. There are five factors proposed by the NGM Team in this dimension. Internal consistency (Cronbach's alpha) in this study was shown to be high (Cronbach's $\alpha > 0.9$). It also show the high reliability of factors and items.

Global Brand Building. In this dimension, this research measured fifty four items for global brand building based on Kitchen and Schultz (2000). Internal consistency (Cronbach's alpha) of the scale used in this study was high in prior study (Cronbach's $\alpha = 0.94$).

Purification and Reliability of Measurement Variables

To purify the measurement scales and

to identify their dimensionality, principal components reliability test with varimax rotation was applied to condense the collected data into certain factors. After reliability test, we used item-to-total correlation and internal consistency analysis (Cronbach's alpha) to confirm the reliability of each research factor. According to Robinson and Shaver (1973) if α is greater than .7, the variable has high reliability, and if α is smaller than .3, it implies that there is low reliability. The reliability of four latent variables was investigated by calculating Cronbach's alpha. The range of the values was between .81 and .89, which indicated all measures were quite reliable.

Structural Equation Model

In order to find out the relationship in the whole research model in this study, a structure equation model (SEM) was used. The criteria of Chi-square, GFI, AGFI, CFI, RMR, and RSEMA were used to evaluate the overall goodness of fit of the model. According to Hair et al. (2010), the value of overall fit of a hypothesized model can be regarded as appropriately significant when each criteria Chi-square is small (p value $>.05$), and fit indices such as the ratio of Chi-square to degrees of freedom ($\text{Chi-square}/\text{d.f.} \leq 2$); goodness of fit index ($\text{GFI} >.9$), and adjusted goodness of fit index ($\text{AGFI} >.9$); root mean square residual ($\text{RMR} <.1$), and root mean square error of approximation ($\text{RMSEA} <.08$) are all fulfilled. The result of confirmatory factor analysis (CFA) produced evidence of an acceptable fit of the model ($\text{Chi-square} = 416.64$; $\text{df} = 224$; $p = .00$; $\text{Chi-square}/\text{df} = 1.86$; $\text{RMR} = .04$; $\text{GFI} = .91$; $\text{AGFI} = .92$; $\text{RMSEA} = .05$). Parameter estimates of the final model were inspected and no problematic occasions were found.

Results

Quantitative Data Analysis

Returned valid questionnaires are female (67.4%) and male (32.6%), mostly range from 41 to 50 years old (35.2%), next are 51 to 60 years old (27.8%). Next, the education of most subjects is graduate (58.8%) but it just show the few gap between post-graduate (41.2%). In the other hand, the descriptive statistics for multiple responses are also described. Base on the percentage of case, the highest frequency of item of communication media selection is magazine (83.7%) then is portal site (76.2). In terms of issue as core capability selection of Taiwanese brand, highest and second are items of innovation and high quality. Last, the ranking of stakeholder of strategic alliance are memberships of strategic organization (78.3%) and supplier (69.5%).

Assumption Tests

The hypotheses in this study were tested by using Structural Equation Modeling. The resulting measurement model has Chi-square /df equal to 1.86 and all values in the model reflect acceptable fit of the data. For finalized model, standardized path coefficients and significance are as below: First, we find support for H1. The results of structural equation model analysis support this hypothesis, showing IMC has a positive effect on global brand building ($\beta = 0.36$, $p < 0.01$). Secondly, we find support for H2. The results of structural equation model analysis show that collaborative marketing has a significant effect on global brand building ($\gamma = 0.27$, $p < 0.01$). Finally, we find support for H3. The results of structural equation model analysis show that collaborative marketing has a significant effect on IMC ($\gamma = 0.33$, $p < 0.01$).

Conclusion And Future Research

In this section, this research attempts to propose and to provide suggestions and direction for building a global brand. First, in

order to integrate awareness, image, database, stakeholder, customer and evaluation approaches at the stage of allying a strategic alliance by Taiwanese corporations, the members of strategic alliance must solve the issues of legal-financial facilitator and core capability to implement collaborative marketing for increase the performance of IMC base on verified results of H3. Furthermore, this research summarize that in order to achieve the goal as building a successful global brand, the companies must collaborate for marketing by way of method of IMC toward systems theory. Hence, base on a comprehensive understanding, this research suggests Taiwanese corporations should focus

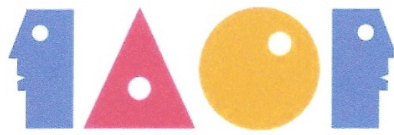
on three aspects as organization culture, organization design and organization process for coordinating and reaching the objective of building a global brand.

This study also has several limitations. In statistics, larger sample size represents actual situation more than smaller sample size and therefore the future research can focus on increasing the sample size. Moreover, the criterion of sampling is brand value. Similarly, the further research can adopt different criteria such as marketing budgets, income after taxes and so on to separate and to compare the different group for constructing more accurate framework.

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EXPLORING THE RELATIONSHIP BETWEEN ORGANIZATIONAL
COMMITMENT & SEXUAL SATISFACTION – AN EMPIRICAL STUDY OF
TAIWAN’S COAST GUARD

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Abstract

This paper examines the relationships between organizational commitment and sexual satisfaction bases in public sectors, using Taiwan’s Coast Guard Officers as an example. A total of 500 coast guard officers participate in this survey. Significant influences are found between sharing one’s commitment with one’s college and group cohesion as well as sexual satisfaction.

Key Words: Organizational Commitment, Sexual Satisfaction, Group Cohesion

Introduction

Taiwan’s Coast Guard Administration (CGA), established on February 1, 2000, is responsible for the safety and security of Taiwan's coastline and waters. Research on coast guard officers has grown rapidly during the last 13 years or so. Hence, a quick search in Google Scholar of the key words “coast guard officer” produces over 3880 entries, with most of them appearing since the mid 2011s.

Most of the studies in the literature noted

above stressed on the role of organizational change in the public sector of an organization as the key distinguishing feature separating CGA form other organizational forms. This paper therefore explores the evidence with the empirical study.

A number of studies have reported the associations between sexual satisfaction and gender (Carpenter, Nathanson, & Kim, 2009; Štulhofer, Zelenbrz, Landripet, Kuti, Gregurović, & Tiljak, 2004). Sexual satisfaction also appears to be affected by a variety of micro-level and macro level phenomena from

anxiety and avoidance (Butzer & Campbell, 2008) to female assertiveness (Whitley & Poulsen, 1975), as well as broader cultural factors (Ah Song, Bergen, & Schumm, 1995; Carpenter et al., 2009).

Organizational commitment has been researched by identifying antecedents, or determinants of this attitude in large amount of literatures. Angle (1983) and Mottaz (1986) grouped these factors into two main categories, individual characteristics and organizational characteristics. Thus, individual characteristics consisted of demographic, such as tenure, age, education and gender as well as personality factors such as work values, expectations, and the like.

Organizational characteristics are related to work experiences and included the factors such as task characteristics, pay, promotional opportunities, social involvement, etc. This study takes an exploratory step to examine the relationships between organizational commitment and sexual satisfaction.

Theoretical Framework

Factors in the Organizational Commitment

Organizational Commitment can be defined as the relative strength of individual identification with and involvement in a particular organization. According to Porter et al. (1974), organizational commitment was characterized by three factors of (a) a strong belief in and acceptance of the organization's goal and values, (b) a willingness to exert considerable efforts on behalf of the organization, and (c) a strong desire to maintain the membership in the organization.

Demographic variables and Organizational Commitment

Mason (1995) pointed out that it was the degree to which employees believed in and accepted organizational goals and desired to remain with the organization. Cooley and Gjesvold (2003) affirmed that men and women did not differ on organizational commitment and both were equally satisfied with the company policies. Nonetheless, as men and women experienced different socio-psychological realities at the workplace, they were likely to differ significantly in their organizational commitment.

Sommer et al. (1996) found that position, job tenure, and age were significantly related to organizational commitment for Korean subjects. Especially, those with higher positions, who had been in the same job longer, and who were older had greater levels of organizational commitment (Chen, Zhan Xiong and Marie Francesco, Marie, 2000).

Several studies indicated that organizational commitment varied directly with educational level (Lee, 1971; Steer S. & Spencer, 1997). Hence, Mottaz (1986) concluded that higher work values associated with increasing education. Based on this reason, the following hypotheses are proposed.

Hypothesis 1: In Taiwan's Coast Guard Officers, demographic variables will significantly influence organizational commitment.

Hypothesis 1 – a: Age will significantly influence organizational commitment.

Hypothesis 1 – b: Position will significantly influence organizational commitment.

Hypothesis 1 – c: Tenure will significantly influence organizational commitment.

Hypothesis 1 – d: Education will significantly influence organizational commitment.

Hypothesis 1 – e: Marital status will significantly influence organizational commitment.

Factors in Sexual Satisfaction

Physically sexual satisfaction was also influenced by other social factors and was a relevant object for a sociological study. (Haavie Mannila and Kontula, 1997). Sprecher and Cate (2004) defined it as “the degree to which an individual is satisfied or happy with the sexual aspect of his or her relationship.”

Based on Hudson’s 5 dimension conceptual model, Stulhofer and colleagues (2010) developed Bicultural Validation of New Sexual Satisfaction Scale which classified the potential determinants or components of sexual health and, consequently, sexual satisfaction. The five dimensions were identified as (a) sexual sensations, (b) sexual presence and awareness, (c) sexual exchange, (d), emotional connection and closeness and (e) sexual activity. Based on this reason, the following hypotheses are proposed.

Hypothesis 2: In Taiwan’s Coast Guard Officers, sexual satisfaction will significantly influence organizational commitment.

Hypothesis 2 – a: Emotional closeness and sexual activity & performance will significantly influence harmony.

Hypothesis 2 – b: Sexual sensations and emotional closeness will significantly influence group coherence.

Hypothesis: 2 – c: Sexual exchange and sexual awareness will significantly

influence loyalty.

Demographic variables and sexual satisfaction:

Hypothesis 3: In Taiwan’s Coast Guard Officers, demographic variables will significantly relate to sexual satisfaction.

Hypothesis 3 – a: Gender and age will significantly influence sexual satisfaction.

Hypothesis 3 – b: Education will significantly influence sexual satisfaction.

Hypothesis 3 –c: Marital status will significantly influence sexual satisfaction.

Method

Participants and Procedure

The questionnaires, enclosed in envelopes for delivering to the coast guard officers, were distributed to 500 officers with various ages and education levels.

Measures

Organization Commitment: The construct of Organization Commitment was measured by 9 items extracted from the 17-item Organization Commitment Scale that was developed by Buchanan (1974). Reliability and validity of this scale were both soundly verified. The Cronbach’s alphas of the three dimensions were identification 0.827, loyalty 0.831, and involvement 0.791. Sample items for the three dimensions were “I am quite proud to be able to tell people who I work for” (Identification), “Even if the firm is not doing too well financially, I would be reluctant to change to another employer.” (Loyalty), and “In my work, I like to feel I am making some efforts, not just for myself but for the organization as well” (Involvement).

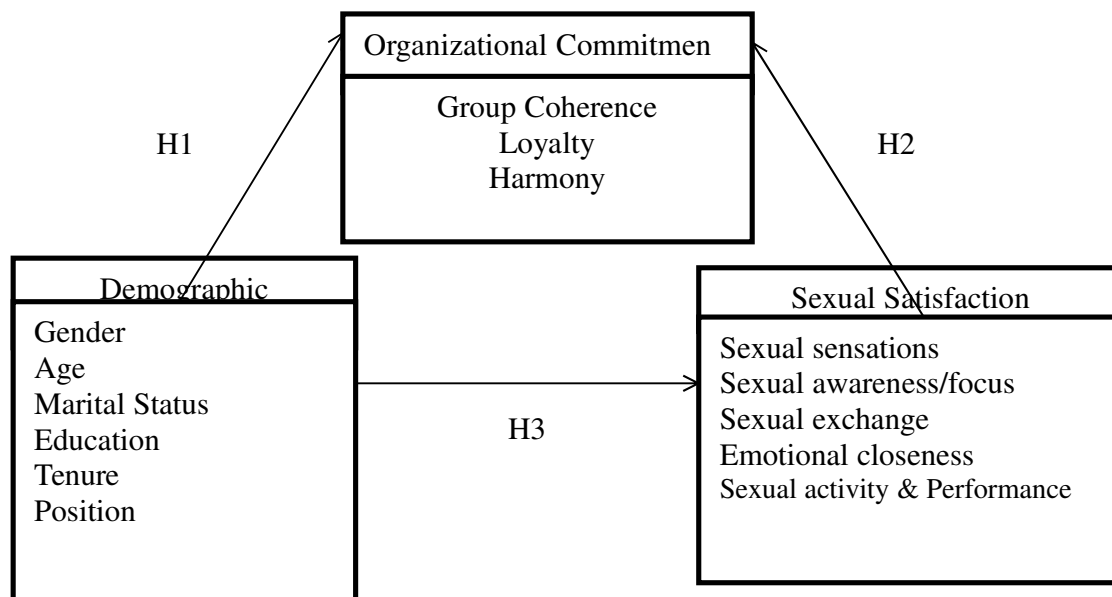


Figure 2. The research model and hypothesis

Harmony: For the measurement of Harmony with three dimensions of working atmosphere, trust, and participation, Fiedler's (1967) scale, was used for measuring working atmosphere. The Cronbach's alpha was 0.902. For trust from Cook and Wall's (1980) scale, there were 4 items. The Cronbach's alpha was 0.831. To observe participation, Vroom's (1960) scale, with 3 items, was used. The Cronbach's alpha was 0.812.

The Group Cohesion Variable.

The Group cohesion measure is a 3-item scale based on Beehr's (1976) 3 items. The Cronbach's alpha was 0.870.

Demographic variables

Six demographic attributes were measured and used as the control variables in the regression analysis. Gender was coded 1 designating male and 2 designating female. Age, education and organizational tenure were measured by numbers of years. Marital status was coded 1= married, 2= single, 3=

divorce, 4= separation, 5= widower/ widow, 6= other. Position was coded 1 for office duty, 2 for field duty, 3 for the basic level supervisor, 4 for the mid-level supervisor and 5 for the high-level supervisor.

Sexual Satisfaction.

Hudson and colleagues' (1981) Index of Sexual Satisfaction (ISS) was developed to measure the degree of sexual dissatisfaction in a relationship and monitor and assess the progress in treatment for sexual satisfaction (Mark et al., 2013). The development of the scale was based on a 5-dimension conceptual model that emphasized the importance of multiple domains of sexual behaviors including sexual sensations, sexual awareness/ focus, sexual exchange, emotional closeness, and sexual activity. The Cronbach's alpha of the scale was .47 (N = 4770). The scale proved to have acceptable internal consistency (Cronbach's $\alpha = .47$).

Table 1. Educational Level by Occupational Category Number

Educational Level	Occupational Category					Total
	Office	Field	Basic	Mid	High	
Junior	7	6	1	0	0	14
Senior	79	102	22	1	0	204
College	33	73	37	3	1	147
Bachelor	35	37	17	6	2	97
Master	2	1	3	8	1	15
Doctor	1	0	0	4	3	8
Total	157	219	80	22	7	485

*Office – office duty, *Field – Field duty, *Basic – Basic level supervisor, *Mid – Mid-level supervisor, *High – High level supervisor

Results and Data Analysis

For hypotheses 1 to 3, the relationships between demographic variables and organizational commitment, between demographic variables and sexual satisfaction, and between sexual satisfaction and organizational commitment were tested by ANOVA.

Variance Analysis between Demographic variables and Organizational Commitment

According to Table 2., in the variance analysis between demographic variables and organizational commitment, age and marriage had significant differences.

Regression Analysis between Sexual Satisfaction and Organizational Commitment

In the regression analysis between sexual satisfaction and organizational commitment. The results are summarized as Table 2. From the results displayed in Table 2., hypotheses 1-a and 1-e had parts established and hypotheses 1-b, 1-c and 1-d were not true.

Regression Analysis between Sexual Satisfaction and Group Coherence

As displayed in Table 3., the regression equation reached the significant level (F value = 34.027, $p < 0.000$). Sexual satisfaction had a significant impact on Group Coherence, "sexual sensations," "emotional closeness" and "sexual activity & Performance" in sexual satisfaction had significant positive impact on Group Coherence dimensions, and all three were

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Table 2. Variance Analysis Between Demographic Variables and Organizational Commitment

Variable	O.C.	F Value	P Value	Post-test
Age	Group Coherence	4.689	0.001*	1324>5
	Loyalty	2.684	0.031*	32415
	Harmony	1.848	0.088	
Position	Group Coherence	1.115	0.349	
	Loyalty	1.274	0.279	
	Harmony	0.229	0.922	
Tenure	Group Coherence	0.905	0.502	
	Loyalty	0.370	0.920	
	Harmony	1.370	0.216	
Education	Group Coherence	1.205	0.306	
	Loyalty	0.233	0.948	
	Harmony	0.871	0.500	
Marriage	Group Coherence	2.838	0.015*	5>2>1473
	Loyalty	1.770	0.117	
	Harmony	1.918	0.090	

* $p < 0.05$ significant ($\beta = 0.210$, $p < 0.001$, $\beta = 0.191$, $p < 0.01$, $\beta = 0.347$, $p < 0.001$).

Regression Analysis between Sexual Satisfaction and Loyalty

The regression equation reached the significant level (F value = 16.419, $p < 0.000$). Sexual satisfaction had a significant impact on the Loyalty dimensions, where "sexual awareness / focus" had a significantly positive impact on Loyalty ($\beta = 0.167$, $p < 0.001$).

Multiple Regression Analysis between Sexual Satisfaction and Harmony

The regression equation reached the significant level (F value = 44.075, $p < 0.000$). Sexual satisfaction had a significant impact on the Harmony dimensions, where "sexual sensations," "emotional closeness"

Table 3. Regression Analysis between Sexual Satisfaction and Organizational Commitment

S.S.(independent)	Organizational Commitment (dependent)		
	Group Coherence	Loyalty	Harmony
sexual sensations	0.210***	0.052	0.094*
sexual awareness/focus	0.088	0.167***	0.091
sexual exchange	-0.096	0.019	-0.008
emotional closeness	0.191**	0.007	0.306***
sexual activity & Performance	0.347***	0.013	0.225***
F Value	34.027	16.419	44.075
significance	0.000***	0.000***	0.000***
R2	0.263	0.147	0.316
Adjusted R2	0.056	0.138	0.309
*p < 0.05 **p < 0.01 ***p < 0.001			

and "sexual activity & Performance" had significantly positive effects ($\beta = 0.094$, $p < 0.05$, $\beta = 0.306$, $p < 0.001$, $\beta = 0.225$, $p < 0.001$) on Harmony. Therefore, parts of hypotheses, 2-a, 2-b and 2-c were established.

Variance Analysis between Demographic variables and Sexual Satisfaction

Table 4, displays differences of demographic variables in sexual satisfaction. From the results displayed in Table 3., hypothesis 3-c had partsestablished and hypotheses 3-a and 3-b were not true.

Discussion

The goal of the current study is to examine the aspects of organizational commitment being influenced by sexual satisfaction. Previous research did not suggest that sexual satisfaction influenced organizational commitment. It is expected that changes in organizational management would establish new issues. Specifically, it is predicted that, sexual sensations, sexual awareness/focus and sexual activity & performance would significantly influence Group Coherence, loyalty and harmony.

Table 4. Variance Analysis between Demographic variables and Sexual Satisfaction

Variable	Sexual satisfaction	F Value	P Value	Post Test
Age	sexual sensations	1.604	0.144	
	sexual awareness/focus	1.670	0.127	
	sexual exchange	1.367	0.226	
	emotional closeness	1.862	0.086	
	sexual activity & Performance	1.461	0.190	
Education	sexual sensations	1.155	0.330	
	sexual awareness/focus	0.275	0.927	
	sexual exchange	0.708	0.618	
	emotional closeness	0.296	0.915	
	sexual activity & Performance	0.931	0.461	
Marriage	sexual sensations	1.658	0.143	
	sexual awareness/focus	2.568	0.026	6>215>43
	sexual exchange	1.827	0.106	
	emotional closeness	1.244	0.287	
	sexual activity & Performance	1.921	0.089	

* p<0.05

Demographic variables – organizational commitment

In this paper, the influences on organizational commitment are presented, that is age to loyalty ($p=0.031^*$) and marriage to group coherence ($p=0.015^*$). Considering the influence of marriage on “group coherence” in organizational commitment, one explanation for this is that marital status is an important factor in struggling to maintain stable life. Also, age significantly influences “loyalty” in organizational commitment. It is interpreted that the elder officers would rather stabilize their occupation situations than search new job.

Sexual satisfaction and organizational commitment

In hypothesis 2, the results (see Table 3) obviously show that the factors of sexual satisfaction, sexual sensations, emotional closeness and sexual activity & Performance, significantly influence the factors of organizational commitment, Harmon ($\beta=0.094$, $p<0.05$; $\beta=0.306$, $p<0.001$; $\beta=0.225$, $p<0.001$) and Group Coherence ($\beta=0.210$, $p<0.001$, $\beta=0.191$, $p<0.01$, $\beta=0.347$, $p<0.001$).

These findings lead us to believe that coast guard officers’ organizational commitment is considerably and positively influenced by their sexual satisfaction. Therefore,

the positive concept from healthy sexual activity would improve the organizational group coherence, commitment, loyalty and harmony in public sectors. Since the study involves only in one coast guard department, the results cannot be generalized. Future studies should be alerted to the limitation of this study.

Conclusion

The results demonstrate that, among nearly 500 Coast Guard Officers from the southern department of Taiwan’s Coast Guard, many of these men and women’ organizational commitment is significantly influenced by their sexual satisfaction. This satisfaction is related to both the quality of the emotional closeness and the harmony. This article points out new possibilities for future research.

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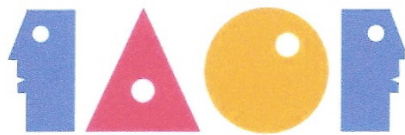
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OPERATION OF FOOD SERVICE CENTERS IN STATE UNIVERSITIES AND COLLEGES IN REGION III, PHILIPPINES: A BASIS FOR A MANUAL ON FOOD SERVICE OPERATION

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Abstract

Educational food services play a significant role in the lives of thousands of student customers. They are ranked directly or indirectly to meet the many needs of students unfortunately, the operation of school food service did not develop as rapidly as that of the commercial food services were quite slow in adapting the trends of improvements of their operations. It is a challenge to educational institutions and food service operators in keeping above average food services for students so as to ensure their safety satisfaction. School food service is most effective when dietitians, school administrators, food managers and allied groups work together to make the food service a nutrition program for all students as part of their learning experiences and contributory to students' mental and physical development.

The basic management of food service center revolves around the managerial undertakings as to planning, organization, command, coordination and control. Various combinations of these functions would contribute to the effective and efficient delivery of services centers of state universities and colleges in Region III, Philippines.

Keywords: Food Service, Operation, Customer Service

Introduction

The history of school food service is inevitably a part of the larger story of the rapid development of public education. As reforms stemming from the Industrial Revolution began to free society from the supposed necessity of child labor, unemployment among children of school age increased and public concern with education soon became evident. To encourage school

attendance, parents and civic-minded townspeople in some European countries banded together to provide low-cost school lunches. It is reported that canteens for school children were established in France in 1849 to 1865, French novelist Victor Hugo started school feeding in England by providing children from a nearby school with hot lunches at his home in exile. At sometime between these dates, school food service began in the United States. The Children's

Aid Society of new York City opened an industrial school in 1853, in an effort to persuade children from the slums to seek “instruction in industry and mental training” and offered food to all who came (Payne-Palacio and Theis, 2000).

Providing meals and rooms for college and university students has been the custom for many years. However, responsibility for the kinds of services offered and the administration of these living situations has changed considerably during the years. It is now a great concern for administrators of universities and colleges to provide and design an effective and efficient food service to their students and other clientele.

Management of college and university food services is usually under the direction of well qualified food service managers employed directly by the university or by a contract food service company. Both plans are found in colleges today. On the other hand, the use of college and university dining facilities as laboratories for food service management classes is a common practice. Undoubtedly, this has helped establish high requirements for food service directors on such campuses. Directing the students’ laboratory experiences and the work of numerous part-time student employees presents unique situation not common in other types of food service organizations.

School food service is most effective when dieticians, school administrators, food managers, and allied groups such as the PTA, recognize its value in the child’s mental and physical development. Then they can work together to make the food service not just a “feeding program” but rather a nutrition program for all students as part of their learning experience.

With the rapid expansion of food

service business specifically in responding to the simultaneous need for a sense of global strategic intent and a sense of localized focus competition that deals with local condition, there is a need for thorough management orientation and training of food service personnel to attain excellent service and fulfill its goals and mission. The force to change seems particularly profound today and it is always with us. Our national institution and customs are floundering due to current recession that signal important shifts to the most applicable and successful way.

The goal of any service institutions in the Philippines and in any part of the world for that matters is the service of quality meals to a satisfied clientele at a reasonable cost. There are many strict rules and regulations in terms of sanitation, meal preparation, even updating the environment image, which at best can ensure provision and satisfactory service.

The type of organization and management found in school food services varies as much as the size and location of schools involved. Small independent schools may have simple on-premise food preparation and service supervised by a cook or manager with one or two employees and/or part-time student helpers. Large city school systems often use a centralized production kitchen and deliver meals for service to individual schools in the system. Centralized management with unit supervisors characterizes this system.

Educational food services play a significant role in the lives of thousands of student customers. They are ranked directly or indirectly to meet the many needs of students unfortunately, the operation of school food service did not develop as rapidly as that of the commercial food services were quite slow in adapting the trends of improvements of their operations. It is for this reason that the

researcher is inquisitive to pursue this study because there is now a growing concern about the safety of students in terms of educational food service. It is a challenge to educational institutions and food service operators in keeping above average food services for students so as to ensure their safety satisfaction. Food services inside colleges and universities play a significant role in nurturing the students, the teachers, staff and the administrators mind and body. The reason for its existence is to provide good food and a balanced meal.

Consequently, food service operators need to understand that they have a big responsibility and influence in the well being of every student inside the campus. The challenge is how to acquire this deal setup for the school administrators to seek different ways of protecting their students from today's increasing dangers of unsanitary food services.

Statement of the Problem

This study was conducted to look into the management and operation of food services centers in State Universities and Colleges in Region III, Philippines.

Specifically, the study attempted to answer the following questions:

How are the food service centers in State Universities and Colleges in Region III be described in terms of:

- Personal Profile
- Training
- Educational Attainment
- Experience
- Technical Know-how
- Operation
- Name of Operation
- Budget to Support Canteen Operation
- Food Safety and Sanitary Practices

How are food services performance evaluated by the patrons in terms of:

- Variety and Quality of food Served;
- Cost;
- Customer Service;
- Hygiene and Sanitation;
- Customer Satisfaction

What problems are met in the operation of food service centers in SUC'S Region III?

What manual on operation could be proposed as a model in State Universities and Colleges in Region III Food Service Center?

Significance of the Study

The findings of the study would serve the following purposes:

First, offer additional and realistic process of food service centers' mode of management and delivery services.

Second, give reference model to address the emerging problems, issues and priorities of food service centers.

Third, call for the initiative in redesigning the management functions of food service centers.

Fourth, suggest appropriate actions for food service centers' administrators and staff to improve the delivery of services so as to meet the needs and demands of the clients.

Fifth, pose a challenge to the school administrators to regenerate support to food service centers in sustaining a quality service to student-clientele.

Last, offer essential data for both DepEd and CHED to set requirements and policies that will help elevate the standard of a school food service on all educational

institutions across all year levels.

Scope and Delimitation of the Study

The study was focused on “Operation of Food Service Centers in State Universities and Colleges in Region III, Philippines.” It looked into the food service centers in terms of personnel profile, training, educational attainment, experience, technical know-how, nature of operation, budget to support canteen operation and school food service sanitation and safety. The performance of food service centers in terms of variety and quality of food served, cost, customer service, food hygiene and sanitation, customer satisfaction were also integrated as well as the problems met in the operation of food service. Thus, manual on operation was proposed as a model in State Universities and Colleges in Region III.

Methodology

The descriptive research analytical method was utilized in this study. This method gave significant aid in analyzing the variable and by critically analyzing the results of the study. Through this method the researcher enabled to present and interpret relevant data needed to the study.

This study was conducted in the seven (7) provinces of Region III among State Universities and Colleges (SUCs), Philippines.

Food service management and performance:

Scale	Verbal Description	Average
5	Outstanding	4.5-5.00
4	Very Satisfactory	3.5-4.49
3	Satisfactory	2.5-3.49
2	Fair	1.5-2.49
1	Poor	1.00-1.49

The respondents of this study were the food service center administrators and staff who directly managed, handled and delivered services of the food services centers among state universities and colleges in region III, Philippines. In sum, there were 63 food service centers managers, 150 services staff, 360 students, and 120 faculty and non-teaching personnel as respondents of the study.

The questionnaire on evaluation of the food service centers were further validated to provide evidence as to the validity of each item in the questionnaire. The try-out validation was done at the Tarlac State University, College of Technology and College of Education which were not included as respondents in the study. Thirty questionnaires were distributed among the faculty/ personnel and students of Tarlac State University. The result provided data which were used for the item analysis, computation of the reliability and validity of the questionnaires.

All significant data gathered were subjected to appropriate statistical treatment to ensure the realization of objectives of the study. To present and evaluate the food service centers status, frequency counts, percentage, ranking and mean with qualitative analyses were employed. The following rating scales with approximations were utilized:

Problems met in the operation of food service centers

Scale	Verbal Description	Average
5	Very serious	4.5-5.00
4	Moderate serious	3.5-4.49
3	Serious	2.5-3.49
2	Less serious	1.5-2.49
1	Not serious	1.00-1.49

Findings

The study revealed the following findings: among the managers of food service centers, majority or a total of 32 or 50.79 % had 1-5 trainings while among the service staff, majority or 97 had no training at all.

Among the 63 managers, majority of them were bachelor's degree holders but not related to food service and few of them pursued graduate studies. Among the food service staff, most of them were 4-year course graduate and others were college under-graduate and high school graduates.

Majority of food service managers had 5-7 years of work experience with a total of 17 or 26.98% same case with the experience of food service staff with 49 or 32.66% as the total. Majority of the respondents obtained "satisfactory" ratings on the different criteria as part of the technical know-how on food preparation.

Eighty-five or 78 percent stated that their food service centers were being leased by private individuals. However, thirteen respondents or 12 percent claimed that the food service centers were being operated by the school cooperative and eleven or 10 percent of the state universities and colleges in region 3 were operated by the school.

The source of budget of food service centers which were owned and operated by

the school was derived from the school fund with a total of 11; personal fund and loans from private banks and lending firms were the source of budget for food centers which were managed by the school cooperative derived from the shares by the school cooperative members.

As to the inquiry on the total amount allocated in the operations, all of them did not identify the exact amount simply because expenses vary every year or depending on the needs and demands of the clients.

Food service centers in Region 3 met the following criteria as indicated by the rating almost always as to: used products that are wholesome and safe, have adequate and quality water supply, provide trash and waste disposal, observe personal hygiene and cleanliness and food handlers have undergone physical health exam as required by DOH and have required health cleanliness.

However, food service centers were found inadequate as proven by the rating of seldom and never in terms of: training of food handlers, analysis on food operation, protocols for observing food borne outbreaks, food hazards, supervision of a knowledgeable person in sanitary food handling, work habits, sanitary washroom, location and ventilation, accessibility to delivery of entrance and exit as well as drinking fountain.

Food services centers that were owned

and managed by the schools are found highly meeting the standard of food safety and sanitary practices with a total of 10. Next in the list was moderately meeting the standard of food safety and sanitary practices with a total of 11 and these food services centers were managed by school cooperative. No food service center was found slightly meeting the standard and lastly; 42 food service centers were found not meeting the food safety and sanitary practices and these were managed and leased by private individuals.

There were 3 indicators which were rated as very satisfactory by both students and faculty/ personnel and these were the following: nutrition, service of hot and cold food and aesthetic appearance. However, there were 3 indicators which were rated as satisfactory with regard to palatability, variety of food served and innovativeness of recipes while 1 indicator obtained a rating of fair on availability of seasonal fresh fruits.

All indicators were rated as very satisfactory by both students and faculty/personnel and these were the following: pricing, affordability, equality of prices to all customers and leftover foods sold at lower prices. There were 3 indicators which were rated as very satisfactory by both students and faculty/ personnel and these were the following: honestly and friendliness, convenience in dining and presence of menu board.

However, there were 4 indicators which were rated as satisfactory with regard to personnel attitude and values, service, courtesy and politeness of personnel and promptness. All indicators were rated as very satisfactory by both students and faculty/ personnel and these were the following: breakfast, A.M. snacks, luncheon P.M. snacks and dinner. Only 1 indicator was rated very satisfactory by both students and faculty/ personnel on self service.

Meanwhile, there were 3 indicators which were rated as satisfactory with regard to counter service, set with tables and delivery service. Only 3 indicators were rated as very satisfactory by both students and faculty/ personnel with regard to lighting and ventilation, properly structured canteen rooms and working area.

However, there were 6 indicators which were rated as satisfactory with regard to storage area; equipment/kitchen wares/ serving paraphernalia, garbage disposal, pest control, provision of nutrition and information board and toilets, urinals and lavatories.

Only 3 indicators were rated as very satisfactory by both students and faculty/ personnel with regard to tables and chairs, comfortability of seats and availability of utensils and equipment.

However, there were 3 indicators which were rated as satisfactory and fair with regard to plates, forks, spoons, glass & cups, functional counter and provision of safe drinking water.

Only 2 indicators were rated very satisfactory by both students and faculty/ personnel with regard to daily bath & cleanliness of server and no nail polish applied.

However, there were 6 indicators which were rated satisfactory and fair with regard to uniform/dress code, strict implementation of wearing hairnet/no mustache, no long nails, wearing of apron, used of hand towels/ dishtowels & potholders and clean shoes & socks.

All indicators were rated as satisfactory by both students and faculty/personnel with regard to food handling and food sanitation.

Consequently, aspects on food handling, purchasing, food storage, leftovers, food preparation, cleaning, dishwashing and water analysis need further improvement as proven by a rating “satisfactory.”

There were 7 indicators which were rated as very satisfactory by both students and faculty/personnel with regard to well defined menus, clarity and payment system, accurate order taking, promptness of giving bills and charge, staff responds to consumer complaints, buss of table after each costumer complaints, buss of the table after each customer and behavior of employees.

However, there were 9 indicators which were rated as satisfactory with regard to quantity of food prepared, opening and closing time, promptness of food served, special orders and request, employees’ knowledge and skills to serve customers, attention given to customers, menu options, specific needs of customer and food service staff.

Furthermore, food service centers experienced the following problems: lack of funds was ranked first, lack of canteen personnel was ranked second, and ranked three point five were the lack of facilities and equipment and inadequate storage of equipments. Next in rank was the manager is not qualified and technically trained in food service management.

Other significant problems were the following: limited space to serve the customers, poor lighting and ventilation, inadequate water supply, lack of time in food preparation, the school administration is not supportive in the management and operation, no reduced teaching load and ambulant vendors inside the campus.

Finally, the manual is intended to guide

food service managers, service staff and school administrators for effective management and operation of food service centers so as to meet the expectations of the clientele and in order to achieve the standard sanitary and safety practices on food preparation and service.

Conclusions

Based on the findings presented, the following conclusions were drawn:

Food service centers managers and staff had no enough technical skills and orientation to handle the ideal element on food preparation and delivery system. Majority of the service staff had no relevant trainings on food preparation because most of the food services centers were managed and operated by private individuals, that is why trainings were not given priority. They were concentrated in earning income and how to increase their sales. Another reason attributed to this situation was that, there was no monitoring scheme in ensuring the technical skills and knowledge of personnel on food preparation and service.

Food service managers were graduates of any four year course, it only shows that they still need formal trainings in food service management as well as applied nutrition.

Respondents had more than five years of experience on food preparation and service which is an indication that they could handle the task properly.

Further improvement and enhancement shall be done as part of the technical know how on food preparation to meet the increasing needs and demands of the clients on food preference and service.

Food service center was not a thrust of

the school since majority of the food service centers were managed and leased by outsiders.

The source of budget was not properly identified since majority of food centers were managed and leased by private individuals and the stability of the budget in the operations was not secured.

The food service centers among the state universities and colleges in Region 3 experienced inadequate observance of the standard safety and sanitary practices. These can be attributed to the inadequate facilities and equipment as encountered by food service centers and most especially due to the insufficient technical know-how among personnel and staff on food preparation to serve the students and other clientele.

Most of the identified food centers which did not meet the standard practices were managed and leased by private individuals. Furthermore, food centers which adhered to the standard practices on food safety and sanitary were owned and managed by the school itself. This is a clear indication that school's active involvement in putting up and controlling food service centers become more effective and adequate in meeting the needs of the clientele as compared when it is managed by outsiders.

Food served by food service centers in region 3 practiced variety and quality for the satisfaction of clientele.

Food served by food service centers in region 3 was adequately studied and related to the buying capacity of clients.

Customer service among food service centers of region 3 was adequately observed to meet the demands of clients though there were identified weaknesses that need certain

degree of consideration and attention.

All types of meals among food service of region 3 were adequately served for the clients.

Food service centers of region 3 served in different ways depending on the needs of clients and the capacity of the food service center in terms of human resources, budget and space.

Food service centers of Region 3 as to physical plant were not properly planned, organized, and implemented. This is an indication that food service centers need re-structuring in terms of its location, dining area, washing area, storage area and the like. Moreover, the food service centers of Region 3 need to adhere with the standard practices or standard operating procedures on physical plant.

Food service centers of Region 3 as to facilities and equipment need further improvement and must be prioritized by SUCs to improve the nutritional requirements and improvements of students. These needed facilities and equipment would lead to provision of continual, sufficient, feasible and acceptable food services.

Food service centers of Region 3 as to hygiene and sanitation observed hygiene and sanitation on other areas but with identified shortcomings on other aspects. A rating of very satisfactory would mean further improvement shall be looked into in order to maintain the real objective of putting up a school canteen of improving the nutrition status of students by making them available to them cheap but nutritious food.

Food service centers personnel had inadequate orientation and training to ensure the safety food needs of the clients especially

the students.

Further improvement shall be done to maintain customer satisfaction. The customer satisfaction can only be achieved if the services offered are well systematized and prioritized.

The problems cited by the food service managers were rooted on the practices caused by limited budget. The school could not buy equipment and have additional personnel and the food service personnel were burdened workloads.

Recommendations

The school should design an evaluation scheme to ensure the effectiveness of food service centers so as to secure the safety of the students.

The school should provide a comprehensive training on food service to include technical know-how, delivery system and food safety and sanitary practices to all food service concessionaires to improve their systems on food services.

The school should conduct a continuing evaluation process to all food service centers especially food centers that are managed and leased by private individuals.

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The school should establish a state of the art facilities and equipment of food service center to cater to the needs of concessionaires thus improve their services and meet the expectations and demands of the clientele.

The school should include food service as one of its thrusts and manage its own food center in order to secure the safety of students with regard to health and food needs. This is also to avoid malpractices on food preparation and service as committed by concessionaires.

Rigid screening of the application for canteen concessionaires should be considered. The administration should not only check the business permit but also the health requirements of the staff as well as their technical know-how in food preparation and service to ensure effective and efficient delivery of canteen services to institutional patrons.

The school administration should allow yearly budget for repair and maintenance, purchase of needed tools and equipment to help improve physical structure.

The manual on food service operation can be used by state universities and colleges in region, provided that they would request for its use from the researcher.

A follow-up or similar study is recommended with another statistical treatment.

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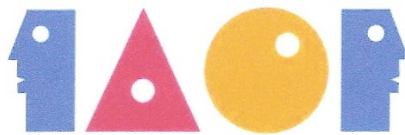
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LISTENING TO YOUTH: AN INTERVENTION

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Abstract

The intervention program entitled “Listening to Youth: An Intervention” was conceptualized and developed based on the case study conducted on selected college absentees from higher education institutions in Tarlac City, Philippines. It hopes to give a remedy to prevent and reduce absenteeism and enlighten absentees’ emotional, mental and behavioral aspects so as to establish comprehensible and acceptable principles, priorities and behaviors. It focuses on three aspects namely: self-understanding and development, career planning and orientation, and value formation and revival.

The data showed that the utilization of the intervention program found effective in preventing and reducing cases on absenteeism in higher education institutions and there was an increase on the subjects’ views and concepts about themselves as expressed in their mean scores in the personality inventory.

Keywords: Listening, Youth, Intervention

Introduction

“Every absence needs a response”.

Non-attendance in school is a problem that extends much further in the future. It affects the students, the family and the community. As such, this problem creates a lot of negative conditions and disadvantages on the part of the students especially in their future career. It would greatly increase the possibility to have a miserable life in the future due to this unacceptable behavior of the students called “absenteeism”. It is often called a gateway crime.

Absenteeism is detrimental to students’ achievement, promotion, graduation, self-esteem and deployment potential. Clearly, students who miss school fall behind their peers in the classroom. This, in turn, leads to low self-esteem and increases the likelihood that at-risk students will drop out of school.

Absenteeism is a period of time when a student does not attend school. Students who do not attend school will generally fall behind their classmates in their academic success. They have fewer opportunities to learn the materials that will help them to succeed. The focus of student absenteeism

ranges from early schooling until adolescent years. Reasons students do not attend school can be influenced by a number of factors ranging from a lack of community support and an unsupportive school environment or family to bad weather, transportation problems and poor health.

One cause of absenteeism is lack of initiative on the part of the parents. It is not uncommon to find children absent from school because their parents did not get them go. Chronic absenteeism is often a family problem. Absenteeism among children is sometimes due to lack of financial support. They usually help their parents find way how they can earn money to support their needs. They are compelled to work to supplement their family's financial resources.

Furthermore, other contributing factors to chronic absenteeism involve parental and school-based responsibility. Absence of parental supervision is only one side of the issue surrounding parental responsibility. Some studies have pointed out that, in many cases, parents actually condone the absences by ignoring or supplying excuses when no valid reason is apparent for their children's absences from school.

With problems resulting from absenteeism, many schools and communities across the country have suggested solutions that place the responsibility on four components of the society: parents, schools, students and communities. Parents who are perceived as contributing to school refusal behavior must receive counseling.

Some schools require counseling and home visits for parents whose children are chronically absent. Stricter adherence to school rules by students is enforced to reduce absenteeism. Schools have a role in taking responsibility for students' absenteeism and

providing sanctions against those who are chronic abusers of attendance policies.

The loss of instruction or poor academic achievement among students with high absenteeism is essential characteristics of students who later drop out from school. Those who drop out from school frequently move on to lives of delinquency and crimes, which has a tremendous impact to society.

Attending school regularly is a critical factor in student success, and poor attendance can have lifelong consequences for students. Students who are regularly absent from school are at risk of dropping out of school early, becoming long-term unemployed, depending on welfare and being involved in the justice system. As such, regular unexcused absence, in particular, is a predictor of undesirable outcomes on adolescence, including academic failure, school drop out, substance abuse and gang and criminal activity.

The needs of today's students are great. Finding solutions to the many problems should be a high priority. Interventions and incentives need to be tailored to individual student's needs and these interventions work best when there is an alliance between the teachers and parents. For student absenteeism, there are a number of interventions that have been implemented within the schools, families, and the community. Within the school setting administrators have implemented interventions and incentive programs with hopes to promote student attachment to school. Peer tutoring has become an intervention in schools which older achieving students are trained to work with younger students who have attendance issues. Teacher or administrative mentors is also an approach at intervening with students with attendance issues. Mentors provide students with opportunities for "prosocial identification." They provide empathic support in helping to

activate self-development, and they also promote experiences that contest students' lowered academic ambitions. The mentor is able to overlook the student's progress and see if there are any ways in which the student can be further helped in getting them to attend school.

In view of this, the intervention program entitled "Listening to Youth: An Intervention" was conceptualized and developed based on the case study conducted on selected college absentees from higher education institutions in Tarlac City, Philippines from 2005 to 2007. As such, it was finalized in 2008.

Statement of the Objective

This study focused on the evaluation and validation of the intervention program on absenteeism entitled "Listening to Youth: An Intervention" in terms of the following indicators:

1. relevance of content and scope
2. suitability and appropriateness of procedures
3. usability and effectiveness in preventing and reducing absenteeism

Research Assumptions

The researcher believed that the intervention program could meet the standard as to the following indicators: relevance of content and scope, suitability and appropriateness of procedures, and usability and effectiveness in preventing and reducing absenteeism. Consequently, the researcher assumed that the intervention program could serve as an additional and alternative instrument in the prevention and reduction of absenteeism cases among students of higher education institutions in Tarlac City,

Philippines.

Significance of the Study

The intervention program hopes to give a remedy to prevent and reduce absenteeism and enlighten absentees' emotional, mental and behavioral aspects so as to establish comprehensible and acceptable principles, priorities and behaviors. Another purpose is to help individuals return to their level of functioning before they committed absenteeism. Functioning may be improved by developing new coping skills and eliminating ineffective ways of coping, such as withdrawal, isolation and vices. Furthermore, the students would be better equipped to cope with future difficulties.

Methodology

To evaluate the effectiveness of the intervention program in terms of relevance of content and scope, suitability and appropriateness of procedures and suitability and effectiveness in preventing and reducing absenteeism, Guidance and Counseling experts were selected as evaluators or validators. They were chosen based on their qualifications, skills and experiences in guidance and counseling services particularly in handling cases on absenteeism.

The study made use of an evaluation instrument to determine the validity of the intervention program and the data gathered by the researcher was statistically analyzed leading to the findings that the Guidance and Counseling experts evaluated the relevance of content and scope, suitability and appropriateness of procedures and suitability and effectiveness in preventing and reducing absenteeism as very good with a grand mean of 3.7. The evaluation result indexes were compared to the following approximations:

Scale	Average	Verbal Description
5	4.5-above	Excellent
4	3.5-4.4	Very Good
3	2.5-3.4	Good
2	1.5-2.4	Fair
1	1.4-below	Poor

To evaluate the effectiveness of using the intervention program in preventing and reducing absenteeism, the one-shot experimental design was used. The mean results were

interpreted using the following rating scales particularly on their performance in personality inventory:

Scale	Average	Verbal Description
4	3.5-4.0	Very Much Developed
3	2.5-3.49	Much Developed
2	1.5-2.49	Moderately Developed
1	1.0-1.49	Slightly Developed

In 2009, the intervention program was utilized with a sample of 5 college absentees. The subjects of the study were tertiary level students from the Tarlac State University, Philippines who incurred absences based on the academic policy of the University. Each student underwent the pretest that determined their entry level. After their exposure to the intervention program, a posttest was administered to see the performance gain among the subjects.

On the aspect of self-understanding and development intervention, knowing oneself is an essential factor to have an enlightened self-concept and better relationship with others. It is believed that absenteeism as presented through the different cases is rooted by the unhealthy self-description and perception. Therefore, it is necessary to provide intervention activities focused on self-understanding, recognition of strengths and weaknesses and skills development. The following are the designed activities:

Moreover, the intervention program was registered in the Copyright Office of the Philippines in July 2009 with the registration number A2009-1731 and was applied in the ISBN National Center Philippines in July 2010 with the ISBN 978-971-796-008-1.

1. *Who Am I*. To be familiar with one's strengths and weaknesses and be able to accept them.
2. *The Core of Me*. To reveal and establish a better understanding of inner self.
3. *My Self, My Symbol*. To demonstrate a clear self-concept and to have a better appreciation of oneself.

Results and Discussion

Content and Scope of the Intervention Program

The intervention program focused on three aspects namely: self-understanding and development, career planning and orientation, and value formation and revival.

On the aspect of career planning and orientation intervention, life is a matter of decision-making. It is necessary that any individual has to take decisions so as to fulfill

his or her dreams in life. As such, one must evaluate to decide. The way one evaluates defines “the person he is to become and the life he is to live.” The different cases presented on absenteeism maybe rooted by insufficient career guidance from authorities and lack of motivation from significant people in their lives. As a result, they suffer and achieve nothing with undirected life. Therefore, it is necessary for them to receive proper help from the people around them especially their families. The following are the designed activities:

1. *My Philosophy in Life*. To establish a clear idea on the importance of having a strong guiding principle in life.
2. *Career Life Planning*. To establish priorities in life and be able to determine one’s own limitations.
3. *Goal-Setting*. To come up with very good decisions in life relative to one’s interests and capabilities. It also aims to make things clearer by establishing two kinds of goals; one kind is called long-term goals and the other is called short-term goals.

On the aspect of value formation and revival intervention, the decisions that we make automatically and consistently reflect the things that really matter to us. Our values can be identified by the priorities that derive our choices and behaviors. We recognize our priorities by the parents which indicate those concerns on which we act repeatedly and consistently. With the cases presented on absenteeism, some of our young people have almost lost some of the important values and discipline. Absenteeism can be considered as one of the manifestations that character and desirability of young people are diminishing nowadays. Therefore, it is necessary to provide a venue for our young people to affirm

and ensure that they are growing in the proper direction, with proper values and inspired by proper priorities. The following are the designed activities:

1. *Value Reflection*. To clarify one’s values and ideals essential to personal formation.
2. *Five Stars*. To determine what the individual values and to establish the proper way of weighing things.
3. *Values Within*. To recognize one’s own personal values necessary to personal growth and development.

Evaluation of the Intervention Program by Experts

As presented in Table 1, the evaluators/validators judged that the relevance of content and scope, suitability and appropriateness of procedures and usability and effectiveness in preventing and reducing absenteeism of the intervention program met the necessary characteristics wherein it was interpreted as very good with a grand mean of 3.7. For this reason, as reflected in the overall evaluation made by experts, they approved that the intervention program is an instrument for guidance and counseling services particularly on the prevention and reduction of absenteeism incidences.

Effectiveness of the Intervention Program on the Prevention and Reduction of Absenteeism

As exhibited in Table 2, cases 1, 2 and 3 obtained a difference of 5, case 4 was 7 while case 5 got 6 as the difference on the number of absences. The data signify that absences were reduced as proven by the overall mean of 5.6 with an equivalent percentage of 82.35. Thus, absenteeism can be prevented and

reduced if proper counseling intervention and adequate services are provided to the students. It is important to note that absenteeism is not brought about by a single factor alone, now it is a mere unilateral concern of the key people

in the school system. It is also true that schools have a role in taking responsibility for students' absenteeism and providing possible solutions for those who are chronic abusers of attendance policies.

Table 1. Results of Evaluation of the Intervention Program by Experts

Criteria/Indicators	General Weighted Mean	Verbal Description
Relevance of content and scope	3.6	Very good
Suitability and appropriateness of procedures	3.75	Very good
Usability and effectiveness in preventing and reducing absenteeism	3.8	Very good
Grand Mean	3.7	Very good

Table 2. Results on the Effectiveness of the Intervention Program as to Number of Absences

Case	Before (Midterm period)	After (Final term period)	Difference	%
1	7	2	5	71.43
2	6	1	5	83.33
3	7	2	5	71.43
4	7	0	7	100
5	7	1	6	85.71
Mean	6.8	1.2	5.6	82.35
SD	0.45	0.84	0.89	11.86

As manifested in Table 3, case 1 obtained mean scores of 1.57 to 2.38, case 2 got 1.14 to 2.10 mean scores, case 3 scored 1.62 to 2.43, case 4 got 2.38 to 3.19 mean scores and mean scores of 2.19 to 2.62 for case 5. In this sense, as to the performance of the subjects for the personality inventory, it was revealed that they garnered a grand mean of 1.78 in their pretest while 2.54 in their posttest with a mean increase of 0.76. The data signify that the subjects' self-concepts were improved

from moderately developed to much developed. Thus, feeling good and positive about oneself could be improved and maintained if there is an adequate support system from the family and other significant people. Moreover, increased self-awareness generally leads to better self-understanding and self-acceptance and recognition of one's qualities leads to rational analysis and healthy relationships with others.

Table 3. Results on the Effectiveness of the Intervention Program as to Performance in the Personality Inventory

Case	Before Intervention		After Intervention	
	Mean Score	Verbal Description	Mean Score	Verbal Description
1	1.57	Moderately Developed	2.38	Moderately Developed
2	1.14	Slightly Developed	2.10	Moderately Developed
3	1.62	Moderately Developed	2.43	Moderately Developed
4	2.38	Much Developed	3.19	Much Developed
5	2.19	Moderately Developed	2.62	Much Developed
Grand Mean	1.78	Moderately Developed	2.54	Much Developed

Conclusions

In general, the data showed that the utilization of the intervention program entitled "Listening to Youth: An Intervention to college absentees found effective in preventing and reducing cases on absenteeism in higher education institutions. Also, there was an increase on how they view and look at themselves as expressed in their mean scores

in the personality inventory.

In addition, a learning institution or school can influence on individual's development and can satisfy the need for awareness, knowledge and values. Hence, the school environment can support the developmental needs and goals of every student towards a better learning, discovery and exploration.

Recommendations

1. The intervention program on absenteeism can be used and adopted by higher education institutions subject to the following conditions and requisites:
 - a. The intervention program must be administered and facilitated by a licensed and registered guidance counselor.
 - b. The guidance counselor must follow the proper procedures as indicated in the intervention program.
 - c. The guidance counselor must adhere with the ethical standards in providing guidance and counseling services to clientele.
2. The results that can be obtained from the intervention program shall be used for educational purposes so as to help students achieve their personal and educational goals.
3. Guidance and counseling services must be enhanced through the adoption of such non-traditional and alternative modes of giving services to students particularly in conducting counseling to college students without losing the real essence of counseling profession.
4. Higher education institutions need to be restructured, improve the quality of courses, intensify interpersonal relationships between students and teachers, and take a comprehensive approach to attendance with activities that involve students, families and the community.
5. Further validation of this intervention program must be done in order to maintain its validity, reliability and integrity.

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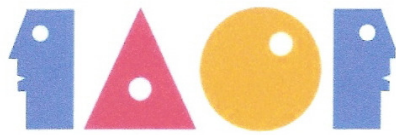
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THE ROLE OF SOCIAL CAPITAL TO IMPROVE CUSTOMER LOYALTY OF ISLAMIC BANKING IN CENTRAL JAVA

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Abstract

Social capital is a strategic asset that could play a role in meeting the needs of the organization and contribute to the reputation of Islamic banking, improve "trust" of Islamic banking community, decline the number of non-performing financing and fund raising for the party which increase in use of variations of Islamic banking products. This study aims to examine the role of social capital, which consists of the dimensions of cognitive, relational and structural toward the loyalty of Islamic banking customers in Central Java. The samples in this study are 80 customers of Islamic banks in Central Java by using purposive sampling technique. Method of data collection is through interviews and questionnaires. Data analysis technique is administered by using partial least square (PLS). Based on the results of data analysis, the cognitive dimension has no significant influence on loyalty. Yet, the relational and the structural dimensions of social capital significantly and positively influence loyalty.

Key Words: Social Capital, Cognitive, Relational, Structural, Loyalty

Introduction

The importance of social capital in improving organizational outcomes has been conducted by several researchers, including the performance of small firms (Stam,

Arzlanian, & Elfring, 2014); organizational innovation (Sanchez-famoso, Maseda, and Iturralde, 2014); commitment and performance (Ellinger, 2013; Leana, 2006). (Ellinger et al., 2013) Some applications of social capital theory have also been implemented at

various level of analysis, including nation (Cote and Healy, 2001; Lin et.al., 2001), community (Putnam, 1995), organization (Nahapiet and Ghoshal, 1998; Watson and Papamarcos, 2008), individuals (Taylor, 2012). Moreover, various definitions of social capital have been defined by many researchers. Baker (1990); Bourdieu and Wacquant (1992); Burt, (1992), define social capital as resources, functions (Coleman, 1988), and results (Fukuyama, 1995; Putnam,1995; Woolcock, 1998). Social capital as a resource is put on social structure consisting of network or assets covering several social aspects (Lin, 1999; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). Several researchers regard social capital as a social resource denoted in relationship such as fellowship and colleague. Social capital is also defined as a result (Fukuyama, 1995; Putnam, 1995; Woolcock, 1998). Putnam (1955) defines social capital as relationships between individuals, social networks and feedback-norms and belief arise from them. Fukuyama (1995) sees social capital as a set of value or norm , such as compassion, altruism,and tolerance among groups that allow relationship among them (Fukuyama, 1995, 1997).

Social capital that has been investigated until today is more focus on the individual within the organization. The dimension of social capital in the form of Structural, relational and cognitive may improve organizational outcomes such as commitment, satisfaction, innovation and performance. In a marketing perspective, social capital can be used by organizations to improve customer loyalty. The dimension of social capital in the form of Structural, relational and cognitive significantly influences behavioral and attitudinal loyalty (Jones & Taylor, 2012). Therefore, this study aims to examine the influence of social capital in the form of relational, structural and cognitive toward customer loyalty.

Literature Review

Customer Loyalty

Loyalty is a strongly held commitment to buy or subscribe to a particular product or service in the future although there is an influence of the situation and potential marketing efforts which cause behavior change (Kotler and Keller, 2007). Loyalty is a condition in which a customer has a positive attitude towards a brand, commits to the brand and intends to continue purchasing in the future. A loyal customer has specific prejudices about what to buy and from whom. A loyalty shows the condition of the duration of time and requires that actions taken are less than two times (Griffin, 2003). A loyalty will result the same purchasing repeatedly form the same product and service. The consistent and repeated purchasing is indicator of loyalty. The consistent and repeated purchasing of the same product overtime is the example of attitudinal loyalty. In attitude approach, loyalty is a personal trait. The different emotions form general customers' loyalty over the product, service or retailer. This emotion figures out personal loyalty.

Affective loyalty is a level of agreement or satisfaction toward product, brand or company. In Conative – behavior loyalty, a customer repurchase the same product as a result of positive emotion over product, brand or company. In action loyalty, customers are ready to purchase in any terms and conditions by ignoring present situation of market and competition. Therefore, customer loyalty is an attitude that motivates behavior to purchases of products/services of a company that includes aspects of feeling in it, especially the regular and repeated purchase with high consistency, by not just buy remanufactured goods and services, but also have a commitment and a positive attitude toward the company that offers those products and

services. Some of the factors influencing customer loyalty are store image (Chang & Corporation, 2005), trust, and service quality (Boohene, 2011).

Social Capital

Several studies have explained social capital such as Nahapiet and Ghoshal (1998); Pastoriza (2009); Coleman (1988); Leana and Van Buren (1999), Bolino (2002), Timberlake (2005), and Abili and Abili (2011). Many empirical studies have been conducted by several researchers associated with such social capital, i.e. Abili and Abili (2012) on social capital management in Iran, Noor et al (2011) on the impact of social capital on job satisfaction of hospital administrative staff in Tehran.

Moreover, the study conducted by Talavera et al.(2012) on social capital and access to bank of financing Chinese businessmen concludes that social capital plays an important role for Chinese entrepreneurs in accessing bank financing. A number of studies have also shown how an organization contributes to the formation of social capital among its employees. One of them is by Leana and Van Buren (1999) who finds that a stable employment relationships and the norms of reciprocity are able to facilitate the formation of social capital among employees. Then, Gittel (2000) argues that human resource practices can be redesigned to form relational coordination among employees involved in the work process. When running consistently on a variety of employment practices, those redesigning shapes lead to produce high-performance work systems. Gittel (2000) shows that the redesigned work practices involving selection, conflict resolution, performance appraisal, job design, and supervision are predicted to be able to increase relational coordination among employees. The statement reiterated by Gittel,

Seidner, and Wimbush (2007), which proposes that the work practices that make up social capital among employees including selection, training, performance appraisal, and compensation based on contribution to the achievement of goals, conflict resolution, as well as mechanisms for coordination and information form a relationship. Furthermore, Gant, Ichniowski and Shaw (2002) reveal that social capital can mediate the relationship between high-performance work practices and outcomes. This form of social capital which has been empirically tested is varied, such as relational coordination (Gittel, 2000), communication networks (Collins & Clark 2003), and collective learning (Lopez et al, 2005).

Social capital is a concept that has been accepted as a valuable asset to protection and public safety, empowerment and civil society organizations (Timberlake, 2005). Social capital plays important roles to determine needs of the organization and contribute to the success and survival in today's competition. Social capital facilitate the sharing of knowledge, the creation of value, competitive advantage, better performance and organizational development (abili and Faraji, 2009). Abili and abili (2011) divides social capital into three levels. The first is at the micro level in which the formation of human relationships exists anywhere. The second is at the secondary level in which the formation of relationship among members in a group is formed. The third is at the macro level whereby social capital exists in the larger social environment and includes formal relationships and structures such as regulation and legal framework.

Various views on different social capital has been raised by many researchers based on theoretical and empirical studies. Social capital is regarded as a possession of a durable network of institutional relationships based on mutual experience (Bourdieu, 1985).

Companies can develop relationships and networking through available resources in improving the performance of organization. Social capital is also viewed as a network, norms and social trust that facilitate coordination and cooperation for the benefit of each part of the organization (Valeria Sodano et al. 2008). Social capital is the capital of which it is owned by an organization in the form of social relationships that can be developed into the form of formal and informal relationships as a result of interaction with other to obtain the expected rewards. A view in social capital is also expressed by Fukuyama (1999); it is set of values and norms possessed together by members that lead to form relationship and cooperation. While, Putnam (2000) defines social capital as a set of social networking features which are created as result of community and virtual activities that lead to the development of norms and social streams to help cooperation. Therefore, it can be concluded that social capital is actual and potential resources which are able to produce networks relationship of mutual respect and interpret, confidence and trust, adherence to social norms, the spirit to grow together by establishing and utilizing information. Thus, social capital is an organizational network that builds on shared norms with the system of values and a shared understanding that can strengthen cooperation and cohesion in the long term (Ferdinand, 2005).

Nahapiet and Ghosal (1998) divide social capital into three-dimensional organization, namely: the structural, relational and cognitive dimension. Structural dimension is a non-personal relationships between individuals or units within the organization, which shows the pattern of relationships and interactions among people within the organization to learn, give and share information, ideas and knowledge. Relational dimension is the inter-personal relationship among individuals within organization that focuses on specific

relationship such as respect and fellowship influencing attitudes and trust among employees, helping each other when needed, being honest and respect each other. Cognitive dimensions determine sources to provide interpretation and concepts shared among individuals within the same social network. Briefly, this shows how much the employees have a clear understanding and perception of the value and purpose of the organization and how much they receive and commit to organization goals.

According to Putnam (2000), social capital has two types, namely internal and external social capital. Internal social capital is a process of internalization of activities within organization that is built internally through a variety of resources owned by the company in the form of human resources, organizational complexity and social capacity growing in a social enterprise. In addition, external social capital is built through the company's ability to develop a variety of social networks and their environments, outside organizational networks, trust building, adherence to norms and social cohesion with the community.

A number of studies has emphasized the importance of social capital on the formation of customer loyalty. Social capital is an organizational network that builds on shared norms with the system of values and a shared understanding that can strengthen cooperation and cohesion in the long term (Ferdinand, 2005). A Structural social capital is more emphasis on non-personal relationships among individuals or units within the organization, which shows the pattern of relationships and interactions among people in the organization to learn, share and give information, ideas and knowledge. In the form of external social capital, the interaction between service providers and customers as well as the sharing and exchange of inform-

ation and knowledge about the product will encourage customers' commitment to repurchase in the long run. The latest research has revealed positive correlation of interaction frequency and loyalty (Palmatier et al., 2006). A double relationship is several links between service provider and customer covering service exchange. Interaction is used to activate the structure of customers' knowledge toward service provider. The high frequent interaction between the customer and the provider will only lead to higher loyalty.

H1: Structural social capital influences customer loyalty

Thus, the relational dimension will form net working between providers and customers so as to strengthen the closeness and commitment among network members (customers) that will lead to a high loyalty to the service providers. Some researchers have found that close relationships like friendships tend to affect the intention to repurchase to customers service (De Wulf et. al., 2001). In addition, there have been numerous studies that have examined the role of commitment to the service provider in determining the intention to repurchase (Bove and Johnson, 2001). Proximity is also found to strengthen the attitude (Gwinner et al., 1998). Furthermore, the presence of customer service lead to the willing to pay more for a reply for a close relationship (Cialdini, 1993), and dedicate all purchases to service providers (Price and Arnould, 1999). Therefore, relational social capital formation will strengthen customer loyalty.

H2: relational social capital influences customer loyalty

Cognitive dimension determine sources providing interpretation and concepts shared among individuals within the same social network. Cialdini (1993) concludes that the

similarity in norms and values tend to increase the development of relationships. This similarity could pursue customers to support the exchange relationship with the service provider (DiMaggio and Louch, 1998). The evidence from the marketing literature to the effect of cognitive social capital on loyalty can be drawn from the results of literature relating to the brand community (Taylor, 2012). Schouten and Alexander (1995) in their study conclude that loyalty is partly happening because of customers communal relationship with other customers. Moreover, Goodwin (1996) also finds that when the service provider is affiliated with similar groups such as customer, the customer may feel obliged to pay a premium price.

H3: cognitive social capital influences customer loyalty.

Research Methods

Sample

The samples in this study are all customers of Islamic banks in Central Java (sharia bank, Bank BNI Syariah, BRI Syariah Muamalat and Bank Mega Syariah) as many as 90 people. Yet, the back and a decent analyzed is about 80 (88.89% response rate). Sampling technique uses purposive sampling method, with the following criteria: once a customer Islamic banks or Islamic business unit of at least 2 years.

Data Collection Techniques

The data is collected by using questionnaires and interviews. Questionnaires are distributed to respondents in the form of close and open questions. The distribution and answering questionnaires are carried out in Islamic banks in research involving surveyors and collected on the spot. Respondents in addition to filling out questionnaires are also

interviewed about their loyalty to the Islamic banks.

Measurement of Variables

The Dimensions of social capital consists of cognitive, relational and structural social capital. The indicators of social capital dimension are developed from Nahapiet and Ghosal (1998) and (abili & abili, 2012). Cognitive social capital consists of five indicators: accomplishing mission and goals whole heartedly, socialization of goals, objectives and values, personal values conformity, approving all important matters of the organization. Relational social capital consists of six indicators: feeling part of the organization's members, the spirit of team-work, mutual respect for the feelings of each other, trust each other, solving problems, having good intention and purpose. Moreover, the structural social capital is composed of: considering the information and ideas in performing job duties, critiquing each other in a healthy and constructive way, exchanging, sharing and giving information. Loyalty variable is measured by using five indicators consisting of: trust, keep doing transaction, increasing the use of variety of products, providing recommendations and advise. All mentioned above is measured by using a Likert scale of 1 to 5 (1=strongly disagree and 5=strongly agree).

Findings And Discussion

Findings

The results of descriptive analysis on Table 1. show that cognitive, relational and structural social capital have high average with a relatively low deviation. High cognitive social capital indicates that the external party service user strongly believes in the mission and goals of the organization to able to understand the socialization goals and objectives of service providers, have compatibility with the personal values of the organization and supports all things by the organization. Thus, the similarity in norms and values tend to increase the development of the relationship between users and service providers. The average value of the high relational social capital indicates that service users feel as part of the organization's members, believe in mutual respect, have confidence, good intentions and objectives to the service provider.

High structural social capital indicates that there is a non-personal relationship between users and service providers to share and give information, ideas and knowledge. High loyalty level indicates that service users have high confidence in the service provider and willing to use the product, giving recommendations and suggestions to the other party.

Table 1. Mean, Standard Deviation

Variables	Mean	Standard Deviation
Cognitive social capital	4.13	0.43
Relational social capital	4.11	0.41
Structural social capital	3.80	0.49
Loyalty	4.01	0.38

Source: Data processed in 2014

Outer Model

Based on the convergent validity test, five indicators of structural, six indicators of relational, and five indicators of loyalty are all valid. Each of them has a value of statistical $T > T$ Table (1.67). However, the indicators of cognitive social capital are invalid.

Composite reliability value is 0.820 for cognitive social capital, 0.882 for relational social capital, 0.839 for structural social capital and 0.787 for loyalty above which are above 0.7, which means that all variables are reliable.

Results of Inner Model

The results of data processing by using Smart PLS software tools obtain output results of the model structure of the construct loading factor that explain the correlation among social capital constructs i.e cognitive, relational, structural and loyalty such as shown in Table 3.

Results of data analysis by using PLS program indicates that cognitive social capital has no effect on customer loyalty, the value of T -statistic = $0.725 < T$ Table 1.67 (H1 is rejected). Relational social capital significantly and positively influences loyalty because the value of T -statistic is $2.140 > 1.67$, it means that the higher the social relational capital is, the higher the loyalty will become (H2 is Accepted). Structural social capital significantly and positively influences loyalty because the value of T -statistic is $1.858 > 1.67$, it means that the higher the structural social capital is, the higher the loyalty will become (H3 is accepted). The value of R -square of loyalty is 0.384. The variation of loyalty can be explained by cognitive, relational and structural social capital is 38.4%.

Discussion

Social capital is essential in improving organizational outcomes, such as commitment and performance (Kaufmann and Carter 2006; Krause et al. 2007). In marketing activities, the ability of the organization to conduct internal and external social capital can increase the customer's trust and commitment which in turn followed by the repurchase of long-term form of loyalty. In line with some previous studies (Nahaphiet & Ghoshal, 1998; Wasko & Faraj, 2005), it is stated that customers who interact over time with others, share the same practices, learn the same skills and knowledge to design norms and practices will gain a common understanding.

Therefore, society or customers who share an understanding and perceptions (ie, cognitive social capital) tend to care about others, obey the common understanding of society. A customer can acknowledge the level of rational capital, have a strong feeling of identification in the community, be liable to get involved in society, and admit and obey norms of cooperation (reciprocal) (Wasko & Faraj, 2005).

The results showed that the relational and structural social capital have a significant effect on customer loyalty. The findings of the study support the findings of Jones and Taylor (2012) stating that the relational and structural social capital significantly influence behavioral loyalty. Cialdini (1993) concludes that the similarity in norms and values tend to improve relations. This similarity could cause customers to support the exchange relationship (DiMaggio and Louch, 1998). Unfortunately, cognitive social capital does not influence loyalty and contradicts with the findings of Jones and Taylor (2012).

Table 2. Result for the outer loading

	Original sample estimate	The mean of subsamples	Standard Deviation	T-Statistic
Cognitive				
CD1	0.719	0.578	0.327	2.196
CD2	0.738	0.681	0.261	2.834
CD3	0.790	0.727	0.273	2.888
CD4	0.669	0.528	0.335	1.996
relational				
RD1	0.782	0.783	0.076	10.227
RD2	0.844	0.841	0.051	16.662
RD3	0.707	0.699	0.095	7.439
RD4	0.826	0.815	0.062	13.261
RD5	0.646	0.615	0.162	3.975
RD6	0.650	0.648	0.119	5.455
structural				
SD1	0.638	0.593	0.176	3.621
SD2	0.750	0.722	0.115	6.531
SD3	0.620	0.587	0.189	3.282
SD4	0.784	0.790	0.081	9.725
SD5	0.773	0.778	0.108	7.165
Loyalty				
LS1	0.713	0.711	0.135	5.267
LS2	0.757	0.760	0.085	8.881
LS3	0.577	0.515	0.162	3.567
LS4	0.652	0.576	0.249	2.621
LS5	0.548	0.588	0.163	3.358

The importance of relational social capital in enhancing customer loyalty occurs when service users who feel they are treated as part of the service provider will feel valued, cared for and involved with the activities of the company. As a result, they will tend to have a high commitment to service providers that have an impact on loyalty. Customer confidence on the spirit of service providers to work with the service user will develop the confidence to make a purchase and would like to recommend to others. Treatment of service

providers to customers in the form of respect, trust will encourage customers to be more respect for companies and, as a result, it will have an impact on fidelity to use the product of providers.

The willingness of service providers to consider the information and ideas on related customer products companies will encourage customers to be more confidence to repurchase the product including variations in products and recommending to other parties.

The willingness of service providers to share information about the company's products voluntarily and exchange of information will increase the commitment of the customer in the purchase of products over and over until the formation of loyalty.

Conclusion

Customer loyalty can be enhanced through a variety of factors, both in marketing

and behavior of individuals, groups and organizations. This study emphasizes the importance of social capital factors in the perspective of the individual in increasing customer loyalty. Companies that are able to carry out the relational and structural social capital will encourage the creation of similarity values, closed relationship with customers which encourage customers to be loyal to the company's products.

Table 3. Result for inner models

	Original sample estimate	The mean of subsamples	Standard Deviation	T-Statistic
Cognitive -> Loyalty	0.090	0.131	0.124	0.725
relational -> Loyalty	0.326	0.327	0.152	2.140
structural -> Loyalty	0.330	0.362	0.178	1.858

Managerial Implications

The relational and structural social capital in improving customer loyalty are very important, so, companies must continually build relationships, interactions, information sharing, foster a relationship of mutual respect, pay attention to ideas and information from customers, be able to build trust, which in turn creates customer loyalty.

Limitations of Research

This research is conducted only in the perspective of individual behavior in

increasing customer loyalty. Thus, it also requires a holistic study involving the factors of marketing. Moreover, the samples taken are only limited to Islamic banks while the ability to do a lot of social capital actually owned by BPR Syariah.

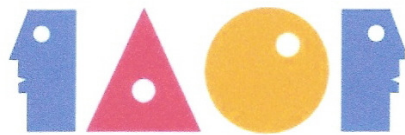
Future Research Agenda

The need for a holistic approach in improving customer loyalty, i.e, by incorporating marketing variables as well as the importance of demographic factors as moderating between social capital and marketing factors is necessary.

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NOSTALGIA OR TASTE? COMPARING CONSUMER COGNITION OF
PINEAPPLE CAKES AND SHOP ATMOSPHERE

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Abstract

With the emergence of experimental marketing in recent years, nostalgia has become an alternative themed experience based on the concept of experiential marketing. Based on the perspective of experiential value, this study investigated whether a nostalgic atmosphere influences consumer purchase intention through various sensory experiences. The results demonstrated that repurchase intention differed considerably among shops with different atmosphere levels. Besides, vision and taste significantly influence experiential value and repurchase intention. In summation, we verified that strong nostalgic stimuli based on sight and taste significantly influences nostalgic emotion. Vision and taste also influenced repurchase intention and experiential value, which produced a mediating effect on the two senses and repurchase intention. Shop owners who wish to operate a nostalgia-themed shop, beyond providing rich and diverse nostalgic stimuli based on the theme, they should focus on providing nostalgic stimuli based on the senses of sight and touch.

Key words: Nostalgia, atmosphere, experiential value, repurchase intention

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Background and Motivation

The global wave of nostalgia that rose at the end of the 20th century continued to spread in the beginning of the 21st century and has become a principal characteristic of contemporary popular culture. When material needs are easily satisfied, consumers subsequently seek spiritual satisfaction. Therefore, the hedonic or emotional experiences involved in the pursuit of spiritual satisfaction are crucial sources of opportunity for businesses to attain competitive advantages.

Although the younger generation of consumers might not have personally experienced the shops or products of the past, such shops or products can trigger nostalgic emotions (Goulding, 2001). Nostalgic products are not life necessities, but they create atmosphere that frequently stimulates consumers' desire to purchase (Lin, Kuo & Chang, 2010). For consumers with various nostalgic mentalities, the products provide a type of experience; in other words, consumers are more concerned with the satisfaction obtained from the product rather than the product itself (Abbott, 1995). Therefore, the varying competitive environment and customer preferences cause customers to become emotional decision makers who

desire to experience pleasant exploration and emotional reactions during the shopping process, and use purchased products in leisure activities (Holbrook, 1993). Consequently, the key marketing demand shifted to creating valuable experiences, and nostalgia was applied in experiential marketing, which resulted in a novel thematic experience for consumers.

Because the five dimensions of the strategy module cannot be conveyed separately, they must be connected with people's lives through experiential media to facilitate the consumers in generating positive product perceptions and strengthen their recognition of experiential values (Schmitt, 1999). Shop owners should provide a valuable customer experience that increases the willingness of customers to pay for these experiences, and shapes customer experiences beyond providing an appropriate shopping environment. These are frequently neglected approaches in traditional marketing (i.e., marketing of lighting, music, and color) (Donovan & Rossiter, 1982). Therefore, companies attempt to integrate all types of experiential media when planning and manipulating experiences, conveying experiences through physical media and forming various experiential levels for customers. Thus, an overall experience is

successfully constructed (Wang, 2003).

According to Taiwan Tourism Bureau statistics, for many years running the top item purchased by foreign tourist visiting Taiwan has been pineapple cakes. The newfound popularity of the pineapple cake has brought an utter change of fortune to this old traditional snack, turning it into a foreign exchange - earning “little gold ingot”. Sales began to burgeon in 2005, growing 16-fold in just five years, from NT\$1.5 billion to NT\$25 billion. The average mainland tourist spends about NT\$1,300 on pineapple cakes. Therefore, pineapple cakes are crucial to the gift markets of both local Taiwanese people and tourists visiting Taiwan. This study used shops selling pineapple cakes as the research background, and, adopting an experiential marketing perspective, conducted experiments to determine the relationship between shop atmosphere and products, and consumers’ emotional perceptions and purchase intentions.

Review of Literature

The relationship between perceptions of nostalgia and experiential value

Nostalgia is a warm feeling of caused by recalling happy memories from the past, full of laughter. Researchers have asserted that this type of joy can create an indulgent atmosphere and uplifting feelings. People

acquire their understandings of the world primarily through sensory experiences. Senses provide connections to memories, which can provoke emotions (Lindstrom, 2005). Value enhancement is achieved and customer expectations are met through the course of interaction (Mathwick, Malhotra & Rigdon, 2001). Studies on the influences of multiple shop environment cues on value perception and repurchase intention have indicated that when consumer perception of shop environment is positive, they perceive greater product value and interpersonal interaction service quality. Additionally, consumers perceive low psychological, time, and effort costs, resulting in high purchase intention (Baker, Parasuraman, Grewal & Voss, 2002).

In a study on supermarket environment (Sirohi, McLaughlin & Wittink, 1998), service quality formed by the service environment directly influenced the perception of product quality and value, as well as loyalty intention towards the supermarket. An atmosphere with a high nostalgia level was defined in this study as the nostalgic stimulus level provided by sensory cues, and the higher the nostalgia level, the stronger the nostalgic stimuli perceived by the senses were. Especially, the environmental factors of vision and taste can evoke experiential value triggered by consumers’ nostalgia. The following hypotheses were subsequently established:

H1: The perception of a nostalgic atmosphere positively influences experiential value.

H1a: Gift shops exhibiting a high nostalgia level elicit higher experiential value than gift shops with low or medium nostalgia levels do.

H1b: The visual perception of a nostalgic atmosphere positively influences experiential value.

H1c: The perception of a nostalgic atmosphere through taste positively influences experiential value.

The relationship between the perception of a nostalgic atmosphere and repurchase intention

The shop atmosphere is a condition factor that influences consumer decision in the service industry. Consumer purchase behaviors exhibited in a shop are directly affected by the atmosphere in the shop, especially in the physical environments of retail sites (Meridian & Rossiter, 1974; Foxall & Goldsmith, 1994). Studies have reported that the atmosphere of shopping centers influence consumer emotions, cognition, and spending. Specifically, the time and amount of money spent on shopping increases in comfortable environments and when consumers feel alert. An enjoyable shop

atmosphere generates positive emotions and enhances purchase intentions (Chebat & Michon, 2003).

Repurchase intention is defined as the possibility of consumers purchasing a product and their actual action intention (Dodds, Monroe & Grewal, 1991). Consumers typically demonstrate purchase behavior characteristics based on previous experiences or ownership (Sen & Johnson, 1997). Repurchase intention is the probability of customers persistently using this product with the same purchase frequency as they did in the past (Davidow, 2003). Consequently, retaining customers and maintaining favorable relationships with customers are long-term competitive advantages for companies.

If shops can develop their own unique atmosphere, consumer decision variations can be stimulated indirectly because shop atmosphere or environment influences consumer moods and their willingness to enter and browse shops (Baker, Grewal & Parasuraman, 2002). Occasionally, shop atmosphere is more influential than the products, and shop atmosphere was more crucial to the nostalgia-themed gift shops that were selected in this study than the products were.

H2: The perception of a nostalgic atmosphere positively influences repurchase intention.

H2a: Gift shops with a high nostalgia level elicit higher repurchase intention than gift shops with low or medium nostalgia levels do.

H2b: The visual perception of a nostalgic atmosphere positively influences repurchase intention.

H2c: The perception of a nostalgic atmosphere through taste positively influences repurchase intention.

The influence of nostalgic atmosphere perceptions on repurchases intention through experiential value

Favorable perceptions of a nostalgic atmosphere in gift shops based on sight and taste strongly elicit emotions that enhance consumers' experiential value, and further enhanced consumer repurchase intention. Consumer perception of experiential value plays a mediating role in the stimulation of nostalgia through sight and taste. In addition, based on an experiential marketing perspective, enhancing consumers' experiential value can increase consumer purchase intention. Therefore, we investigated the sensory triggers of a nostalgic atmosphere, verified repurchase intention, and integrated sensory and emotional experiences in this study to determine the influence of nostalgia-themed experiences on repurchase intention (Schmitt, 1999).

H3: Consumers' experiential value positively influences repurchase intention.

H4: Consumers' perception of a nostalgic atmosphere influences their repurchase intention through their perceived experiential value.

Participants and Design

This study adopted a single-factor, between-subjects field experiment design. To prevent substantial differences in other external conditions among the gift shops, we selected three famous bakeries in Taiwan that sell pineapple cakes and categorized them into high, medium, and low categories based on nostalgic atmosphere level.

The participants in this study were consumers who visited and purchased products from the three selected nostalgic-atmosphere shops in Taiwan. The participants were instructed to complete the questionnaires. A final sample of 180 usable questionnaires was collected, 60 samples for each high, medium, and low categories based on nostalgic atmosphere level. The homogeneity of each category has been tested. To test the hypotheses, measures of each construct were developed using multiple items and 5-point Likert -type scales. The questionnaire on nostalgic atmosphere level (Kolter & Phillip, 1973) was used to measure the consumers' perceptions of the

gift shops based on the five senses. The items included decoration and furnishing, music, aroma, taste of the pineapple cake, and the characteristics of the decoration and furnishing perceived using the sense of touch. The experiential value questionnaire developed by Mathwic et al. (2001) was used to determine consumer preferences that were generated when the consumers interacted with products, services, and experiences. The generated preferences were either further evaluated or decreased the consumption value of the products and services. Based on Aaker (1991), Janes & Sasser (1995) and Kotler (2000), repurchase intention included repeated purchases and word-of-mouth publicity.

Results

Psychometrics properties of the scales Cronbach's α is considered an adequate index of the inter-item consistency of independent and dependent variables. The Cronbach's α value for the dimensions of this study's scales was greater than 0.7, indicating a high reliability (Hair et al., 1998). The Cronbach's α value came to 0.826, 0.897, 0.830, for nostalgic atmosphere, experiential value and repurchase intention respectively.

Hypothesis validation

Gift shops exhibiting a high nostalgia level elicit higher experiential value and repurchase intention than gift shops with low

or medium nostalgia levels do ($F=38.399^{***}$; $F=16.016^{***}$ respectively). Both H1a and H2a were supported fully, as shown in Table 1.

The perception of a nostalgic atmosphere is associated with visual and taste dimensions. The hypothesis H1b and H1c which aimed to test whether experience value is positively influenced by customers' visual perception ($\beta=0.556$; $T=9.394^{***}$) and taste ($\beta=0.300$; $T=5.074^{***}$) are confirmed (Table 2).

As presented in Table 1. The postulated positive influence of customers' visual perception ($\beta=0.449$; $T=6.331^{***}$) and taste ($\beta=0.272$; $T=3.830^{***}$) on the repurchase intention were also significant. The hypothesis H2b and H2c are thus approved, as shown in Table 1. The more the visual perception and taste of a nostalgic atmosphere is positive perceived, the more intention the customer to the repurchase.

This study applied a hierarchical regression analysis to validate Hypotheses 1 to 4. We followed the four steps of hierarchical regression analysis to conduct mediating effect validations (Frazier, Tix & Barron, 2004). Hierarchical regression analysis includes three models. First, the independent variables must produce an effect on the intervening variables. As shown in Table 2, Model M1 simulates the experience

Table 1. Summary of the regression analyses: visual/taste to experience value/repurchase intention

	dependent variable =EV			dependent variable =RI		
	B	Standardized β	T	B	Standardized β	T
constant	1.075		6.361	1.266		6.013
Visual	.432	.556	9.394***	.363	.449	6.331***
Taste	.268	.300	5.074***	.252	.272	3.830***
	justified $R^2=.596$ $F=130.497$ ***			justified $R^2=.413$ $F=63.896$ ***		
EV- experience value RI-repurchase intention						

Table 2. Hierarchical Regression Results

	M1: dependent variable =EV			M2: dependent variable =RI			M3: dependent variable =RI		
	B	Standardized β	T	B	Standardized β	t	B	Standardized β	t
constant	1.060		6.658	1.274		6.421	0.601		3.140
NA	.703	.772	16.195***	0.613	0.647	11.336***	0.167	0.176	2.271*
EV							0.635	0.611	7.882***
EV- experience value NA- nostalgic atmosphere RI- repurchase intention M1: justified $R^2=.593$ ($F=262.285$ ***) M2: justified $R^2=.015$ ($F=1.435$) M3: justified $R^2=.284$ ($F=12.722$ ***) ***Significant at $p<0.001$									

value regression analysis results. The results of adding the independent variable of nostalgic atmosphere into Model M1 show that the independent variable produced a significant positive effect on the intervening variable of experience value ($\beta = 0.772$; $T = 16.195^{***}$), fulfilling the first condition of the mediating effect analysis step and supporting Hypothesis 1. Second, the independent variables must affect the dependent variables. Model M2 illustrates the repurchase intention regression analysis results. The results of adding the nostalgic atmosphere independent variable into M2 show that nostalgic atmosphere has a positive effect ($\beta = 0.647$, $T = 11.336^{***}$) on the dependent variable of repurchase intention, supporting Hypothesis 2. Finally, we added the intervening variable of experience value into M3, where the intervening variable must affect the dependent variable, and the independent variable's effect on the dependent variable decreases. As Model M3 shows, the intervening variable of experience value had a significant positive affect ($\beta = 0.611$; $T = 7.882^{***}$) on the dependent variable of repurchase intention. Therefore, Hypothesis 3 was supported. When validating the mediating effects, nostalgic atmosphere had a significant positive effect on repurchase intention, but weakened the effect of the independent variable of nostalgic atmosphere ($\beta = 0.176$, $T = 2.271^*$) after experience value was added as an intervening variable. Consequently, the condition of Step 3 was obtained, partial supporting Hypothesis 4.

Conclusion and Discussion

With the emergence of experimental marketing in recent years, nostalgia has become an alternative themed experience based on the concept of experiential marketing. Shop owners enhance the marketing level of nostalgia through both products and physical environments. Based on the per-

spective of experiential value, this study investigated whether a nostalgic atmosphere influences consumer purchase intention through various sensory experiences by investigating, comparing, and analyzing the influences of consumer characteristics on several dimensions.

First, regarding the influence of nostalgic atmosphere level on experiential value, shopping in shops with various nostalgic atmosphere levels significantly influenced consumers' experiential values. Thus, the perception of an atmosphere as nostalgic influenced consumers' perception of experiential value, which can be explained with the studies investigating shop atmosphere and experiential value. Regarding the influence of nostalgic atmosphere level on repurchase intention, the results demonstrated that repurchase intention differed considerably among shops with high, medium, and low nostalgic atmosphere levels, which indicated that abundant environmental stimuli enhance consumer repurchase intention.

Regarding the influence of nostalgic stimuli received through sight and taste on experiential value and purchase behavior, we determined that vision and taste significantly influence experiential value and repurchase intention. Visual stimuli can provoke consumer emotions through their memories and taste can enable consumers to experience various flavors. These two types of sensory perceptions elicited the most nostalgic emotions. The perception of experiential value elicited by the nostalgic atmosphere level significantly and positively influenced repurchase intention. Regarding the relationship between the two types of nostalgic sensory perceptions (i.e., vision and taste) and repurchase intention, the influence of taste was inferior to that of vision. Visual nostalgic stimuli provoked stronger repurchase intention and experiential value fully mediated the

relationship between visual nostalgic stimuli and repurchase intention. Thus, the visual perception of nostalgia positively influences repurchase intention through experiential value. However, the hypothesis that the perception of nostalgia based on taste positively influences repurchase intention through experiential value was only partially supported by the statistics. The difference between vision and taste was that other than eliciting emotion, vision prompted consumers to recall memories.

As a type of emotional experience, provoking nostalgia requires external stimuli; therefore, only uncomplicated and high nostalgia levels can truly and efficiently elicit consumers' nostalgic emotions. In summation, we verified that strong nostalgic stimuli based on sight and taste significantly influences nostalgic emotion. Vision and taste also influenced repurchase intention and experiential value, which produced a mediating effect on the two senses and repurchase intention.

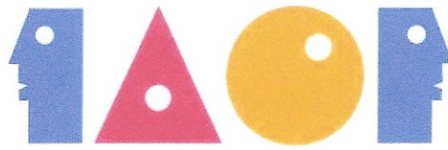
As the use of experiential marketing increases, nostalgic charm is increasingly apparent in the products and atmosphere of shops. Through the design and decoration of the shops, the shop owners simply used objects that appeared historical for decorating the shops to recreate a nostalgic atmosphere, believing that a nostalgic appearance could induce authentic nostalgia. Therefore, only by creating unique and highly nostalgic atmospheres can shop owners provide consumers with a completely nostalgic emotional experience. By using this approach, they can attract the repurchase intentions of consumers. We suggest that shop owners who wish to operate a nostalgia-themed shop, beyond providing rich and diverse nostalgic stimuli based on the theme, they should focus on providing nostalgic stimuli based on the senses of sight and touch. If they can successfully apply this environmental design, then such designs can

be used as an effective tool for operating nostalgia-themed shops.

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HOTEL CHOICE CRITERIA BY BUSINESS AND LEISURE TRAVELERS

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Abstract

This study decomposes factors of attributes considered by two groups of travelers while making hotel choices. Each group's responses were factor analyzed. Five dimensions were determined for both groups: general amenities, convenience, core service, room amenities, and ambiance. However, the order of importance differs by the two groups of travelers. The attribute's order of importance within each dimension is also different by the two groups.

Keywords: motives, business travelers, tourists, hotel

Introduction

With rapid economic growth, the people of Taiwan are placing more emphasis on living quality, as well as increased travel activities. According to the Tourism Bureau of Taiwan, the number of domestic travels reached 152.27 million in 2011, which represents an increase of 23% from the previous year. On the other hand, the number of inbound travels reached 6.09 million in 2011, which represents an increase of 9.34%

from the previous year. Of those inbound travels, 3.63 million (11.95% increase from the previous year) were by tourist travels and 0.98 million (5.02% increase from the previous year) were by business travels. From increased travels, the number of hotels in Taiwan has increased as well, from 6803 in 2010 to 7002 in 2011. With tourism promotion, the entry of large-scale International Hotels is taking place in Taiwan. International Hotels are an important part of tourism which provides a place for lodging, banquets,

business conventions, and recreational activities. They are also the best place to accommodate ambassadors. Data showed that International Hotels' occupancy rate had increased from 76.01% in 2010 to 78.53% in 2011, representing a 2.52% increase.

Due to competitive nature of the tourism industry, it is essential for hoteliers to know what motivates travelers and what travelers want. Hotel customers primarily come from business and leisure travelers. This paper examines how business and leisure travelers choose hotels. Various studies had shown cleanness and location to be the selection criteria for business travelers while leisure travelers consider security, personal relationship, and room price to be their selection criteria (Lewis, 1985; Taninecz, 1990; Marshall, 1993; McCleary et al., 1993; Clow et al., 1994).

Overall, hotels attract travelers by the service they provide. On the other hand, what measures that travelers use as their selection criteria for hotels remain to be the topic of discussion. What are the attributes of factors that business and tourist travelers consider when choosing hotels? From literature review, this paper attempts to understand travelers' needs and motivations when choosing hotels. The study uses questionnaire survey and statistical software to analyze factors and attributes that travelers consider when choosing hotels. The findings may serve as a useful reference for hoteliers.

Literature Review

A number of literatures had studied leisure motivation. For example, travelers' motivation for leisure participation is to satisfy their physiological/psychological needs (Iso-Ahola, 1989; Witt & Wright, 1992). Beard and Ragheb (1983) examined social

and psychological motivations for those who participate in leisure activities and developed four subscales for dealing with intellectual, social, competence-mastery, and stimulus-avoidance dimensions of motivation. Manfredi et al. (1996) concentrated on the states and goals that the practitioners look to achieve when analyzing motivation in leisure activities. Usually, these states and goals emerge from the results of factor analyses. Nonetheless, motivation is usually accepted as an interaction of internal and external factors (Kelly, 1990; Recours et al. 2004).

Internal factors are conscious and unconscious psychological compulsions. External factors are social and familial gratification and recognition. One of the most widely discussed theories of motivation is the famous Maslow's (1943) hierarchy of needs. The five hierarchic classes from basic (lowest) to complex (highest) are: physiology, safety, love/belonging, esteem/recognition, and actualization. Maslow (1987) also believed that motivation is driven by unfulfilled psychological needs and exists hereditary among human characteristics.

In the study of travelers' motivation of hotel selection, Lewis (1985) used multiple-regression analysis to determine the underlying factors hotel guests use but unaware of. It was found that service quality is a determinant factor for business travelers while pleasure travelers prefer quiet. Other attributes for pleasure travelers are: security, room/bath condition, price-value relationship, and service quality. Knutson (1988) found leisure travelers to be more concerned with room rates than business travelers do. It was found that the most salient considerations of hotel choice by both groups of travelers are: clean/comfortable room, convenient location, prompt/courteous service, safety and secure environment, and employees' friendliness. McCleary et al. (1993) studied business

travelers' situational influences of hotel selection. Two factors emerged in the multiple discriminant analysis, banquet (meeting) facilities and convenient location.

Although it is generally believed that the criteria of hotel choice are different among business and leisure travelers, Yavas and Babakus (2005) presented a study of congruence between the two guest groups. Factor of general amenities exhibited congruence (as the most important factor) between the two groups. Core service was the 2nd most important factor for leisure travelers and 3rd most important for business travelers. Yavas and Babakus (2005) recognized the purpose of business trip may affect the importance placed on different underlying factors, which is consistent with the study of McCleary et al. (1993). Likewise, leisure travelers with children may have different expectations than those who travel as couples or singles. On a closing note, Yavas and Babakus (2005) pointed out that their study was based on data from one locality (an U.S. southeast metro area). It was suggested that replications among other samples of respondents in other localities are necessary for conclusive generalizations.

Method

Guests staying at various International Hotels in Hsinchu (Taiwan) were used as the scope of this study. The hotels include Ambassador Hotel, Howard Hotel, Lakeshore Hotel, and Sheraton Hotel. The survey used convenience sampling method in which questionnaires were placed on the desk of each room and collected the following day by the housekeeping staff, with consent from hotel supervisors. Each guest only receives the questionnaire once regardless of the length of stay. The guests were asked to indicate the importance level they attach to attributes on a

5-point Likert scale. Of the 200 distributed questionnaires, there were 121 valid returns out of 129 total returns, an equivalent of 60.5% valid return rate. Of the 121 valid returns, 82 respondents indicated their stay as business while 39 stated their purpose as for pleasure. From the structural equation model (SEM) of Hair et al. (2006), more number of samples does not necessarily render better results, especially when the Maximum Likelihood Estimation (MLE) is used. Thus, the number of samples used in this study is adequate.

The list of attributes travelers use in the selection of hotel was called from literatures (Lewis, 1984; Knutson, 1988; Mc-Cleary et al., 1993; Yavas & Babakus, 2005). The initial questionnaire was reached from opinions of experts and scholars. It should be noted that the initial questionnaire had 18 attributes but was reduced to 12 attributes after the pretest (from 96 valid returns) and its subsequent preliminary analysis. This was done by deleting items of low means and contraction of others. For example, there is little variation among hotels in their offered "room amenities". Little variation was also shown in "room comfort" among hotels. Thus, elimination or contraction was done and in their place is the attribute of "room cleanliness". "Express check in/out" was simply contracted as "promptness of service". Table 1 presents a listing of 12 finalized attributes used for the finalized questionnaire.

Results

Results of the factors analysis are presented in Table 2 (business travelers) and Table 3 (leisure travelers). The analyses rendered five factors for each Table. Factors were named after the attributes that had their highest loadings on that factor. Factors with eigenvalues greater than 1.0 were retained.

Table 1.

List of attributes for the selection of hotels	
A1. Exercise facilities / fitness center	A7. Promptness of service
A2. Recreational facilities	A8. Room rates
A3. Booking operation	A9. Access to computer / internet
A4. Location	A10. Cleanliness of rooms
A5. Security / safety	A11. Attractiveness of interior design
A6. Meeting facilities	A12. Entertainment lounges

Table 2.

Attribute	Factor loadings: business travelers				
	Factor 1: general amenities	Factor 2: convenience	Factor 3: core service	Factor 4: room amenities	Factor 5: ambiance
A2	0.79				
A1	0.64				
A3		0.87			
A4		0.64			
A6			0.82		
A5			0.77		
A8			0.68		
A7			0.62		
A9				0.88	
A10				0.78	
A11					0.73
A12					0.69
Eigenvalue	3.46	3.05	1.78	1.34	1.08
% variance	27.86	25.07	17.25	12.63	11.94

Factor 1, in the business travelers sample of Table 2, reflects an overall “general amenities” dimension, pertaining to the access of exercise facilities, fitness center, and similar others. Factor 2 suggests a “convenience” dimension, attributing to the ease of making reservation, hotel location, express check-in and check-out. From the percentage of variance, it appears that “general amenities” (28%) and “convenience” (25%) are the two most important factors considered by business travelers. Factor 3 suggests a “core service” dimension. The “core service” may include promptness of service, service speed, meeting

facility, security/safety, and room rates. Table 2 shows that business travelers weigh meeting facility as the most important attribute among “core service” dimension. The two obvious indicators of Factor 4 are “access to digital service (internet)” and “room cleanliness”. Finally, the least important factor considered by business travelers is the “ambiance” dimension (Factor 5), representing a variance of less than 12%. The result of Factors 4 and 5 are easily understandable due to the nature of trips by business travelers. Business travelers need internet (fax) during their trip (Factor 4). They only demand clean rooms (Factor 4) for

Table 3.

Factor loadings: leisure travelers					
Attribute	Factor 1: general amenities	Factor 2: core service	Factor 3: convenience	Factor 4: ambiance	Factor 5: room amenities
A1	0.82				
A2	0.76				
A8		0.86			
A5		0.84			
A7		0.71			
A6		0.61			
A3			0.73		
A4			0.53		
A12				0.87	
A11				0.82	
A10					0.79
A9					0.72
Eigenvalue	3.13	1.72	1.38	1.17	1.15
% variance	23.68	15.17	13.25	12.23	11.07

their stay while not caring too much for the luxury of interior designs and entertainment lounges (Factor 5). As shown in Table 3, the same five factors emerged in the case of leisure travelers. Factor 1 (general amenities) is also the most important factor for leisure travelers, accounting 24% of the variance. However, business travelers weigh recreational facilities more than exercise/fitness facilities while leisure travelers value exercise/fitness facilities more than recreational facilities. The order of importance for the other four factors also differs. Unlike the case of business travelers, the second and third most important dimensions are “core service” and “convenience”, accounting 15% and 13% of the variance respectively. Leisure travelers consider room rates above all others in the “core service” dimension. In the “convenience” dimension, both business and leisure travelers weigh booking operation more than hotel location. It must be noted that the sample was taken by guests in their hotel of stay. Consequently, the location of the hotel has already been accepted by the guests who

filled out the questionnaires. Thus, both business and leisure travelers value the convenience of booking operation, express check-ins and check-outs more than hotel location in the “convenience” dimension. Then, as opposed to the case of business travelers, Factor 4 is the “ambiance” dimension for leisure travelers, accounting for a variance of more than 12%. Differ from business travelers, the leisure guests value entertainment lounges more than attractiveness of interior design in the “ambiance” dimension. Finally, the least important factor in the leisure traveler sample is “room amenities”, accounting 11% of the variance. Previously, it was explained that the nature of business travelers demands the accessibility of computer/internet more than interior design in “room amenities”. In the case of leisure travelers, the nature of leisure guests would demand less of computer/internet access.

While the five dimensions are the same for both groups of travelers, the order of importance vary across these two guest

groups. The only exception is the first dimension (general amenities) which is equally important for both guest groups. The attribute's order of importance also exists within each dimension for business and leisure groups. For example, in Factor 1 (general amenities), business travelers weigh A2 (recreational facilities) more than A1 (exercise /fitness facilities) while leisure travelers weigh A1 more than A2.

Conclusions

Similarities and differences exist among preference of hotel choice criteria by the two groups of travelers. For similarities, both guest groups indicated that their top five hotel choice criteria are: general amenities, core service, convenience, room amenities, and ambiance. However, the corresponding importance of both the Factors and the Attributes are mixed. For factors, the order of importance by business travelers is: general amenities, convenience, core service, room amenities, and ambiance. The order of importance by leisure travelers is: general amenities, core service, convenience, ambiance, and room amenities.

For general amenities' attributes, business travelers prefer recreational facilities (A2) over exercise/fitness facilities (A1). On the other hand, leisure travelers prefer exercise/fitness facilities over recreational facilities. For convenience's attributes, the order of

importance is the same for both guest groups, booking operation (A3) over location (A4). For core service's attributes, the order of importance by business travelers is: meeting facilities (A6), security/safety (A5), room rates (A8), and promptness of service (A7). The order of importance by leisure travelers is: room rates (A8), security/safety (A5), promptness of service (A7), and meeting facilities (A6). For room amenities' attributes, business travelers prefer computer /internet access (A9) over room cleanliness (A10) but leisure travelers prefer room cleanliness over computer/internet access. For ambiance's attributes, business travelers prefer attractiveness of interior design (A11) over entertainment lounges (A12) but leisure travelers prefer entertainment lounges over interior design's attractiveness.

The results taken altogether suggest hoteliers need to manage business and leisure travelers with different approaches. Marketing should be directed to each group based on what is important to them. It should also be pointed out that the study was conducted on guests who had already decided on their choice of hotels. Thus, location of the hotel has already been accepted by participants of the survey which may have diluted the importance of location on their response. Extension of this research to examination of response from business and leisure travelers who are staying or not staying at the hotel would be fruitful.

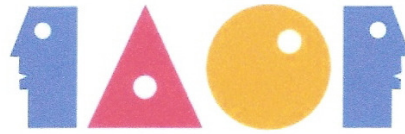
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RAM INJECTION MOLDING MOLD FLOW ANALYSIS AND PROCESS PARAMETER OPTIMIZATION

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Abstract

This study conducted injection molding mold flow analysis on the plastic fitting, namely ram, and controlled the process parameters to improve the amount of warpage. The 3D drawing software Pro/E was used to design the product shape, and Moldflow software was used for mold flow analysis. Six process parameters, including plastic melting temperature, mold temperature, injection time, packing pressure, packing time, and cooling time, were used as initial control factors. The Moldflow software was used for simulation, combined with the Taguchi $L_{25}(5^6)$ orthogonal array, and ANOVA to determine the significant process control factors. The Taguchi method was combined with an artificial neural network to train the function of injection molding input output relationship. A set of corresponding warpage values were obtained by importing the process parameters. The artificial neural network was combined with a genetic algorithm with a global solution to determine the minimum warpage amount process parameter combination. This set of optimum parameters can serve as a reference for the process parameters of future injection molding in order to shorten mold testing time and reduce production costs, and product quality is

stable and bulk production is feasible.

Keywords: injection molding, mold flow analysis, Taguchi experimental design, artificial neural network, genetic algorithm.

Introduction

Under the market competition in recent years, product development cycle has been shortened and quality has been improved to enhance the overall competitive capacity of enterprises. The industrial circle has imported the computer integrated manufacturing systems of CAD (Computer Aided Design), CAM (Computer Aided Manufacturing) and CAE (Computer Aided Engineering). With the development of PC equipment and computer processing speed, CAE has been universally used, especially the plastic injection molding processing technology. The common plastic molding technologies include injection molding, extrusion molding, blow molding, co-injection molding, and gas-assisted injection molding, where injection molding is the most extensive and the most representative. (Chang, Y.Y. 1998)

With the increasing advancements of computers, the CAE technology is used for mold development. However, the major function of CAE mold flow analysis is to import the 3D product design model into a computer for simulation analysis to predict the result without testing injection molding, thus, the cost of injection molding testing is greatly reduced, product development time is

shortened, production efficiency is increased, and bulk production is implemented. As plastic material is a polymer elastic and viscous material, the molten plastic is injected, cooled, and removed from the mold, the molded product will have volume shrinkage and warpage, which influences the dimensional accuracy of a product. Therefore, controlling molding process parameters, predicting dimensional shrinkage, and reducing warpage are very important research subjects.

Literature Review

In 1980, W.L.Krueger and Z.Tadmor (Krueger, W.L., 1980) conducted short shot experiments, adjusted screw positions, and fixed the screws for injection filling, and the result was quite similar to the theoretical prediction. In 1998, K.M.B.Jansen et al. (Jansen, K.M.B., 1998) proposed changing the injection process parameters, including packing pressure, injection filling speed, mold temperature, and melt temperature, in order to measure the shrinkage data of seven different thermoplastics. In 1999, Ko-Ta Chiang (Chiang, Ko-Ta, 1999) used the Taguchi method to optimize the process parameters of a thin shell plastic part. The result showed that packing pressure was the most important factor, and the warpage of plastic parts was

successfully improved. In the same year, Ming-Chih Huang and Ching-Chih Tai (Ming-Chih Huang, 1999) used the Taguchi experimental design to determine the important factors influencing the warpage amount of thin shell molded parts. In 2008, Chen (Chen, B.L., 2008) used the Taguchi Method (L_{25}) orthogonal array to determine the optimum parameter combination influencing the warpage variations of mobile phone shells during the injection process. In 2008, Liu (Liu, Y.C., 2008) researched the effects of rheological, thermophysical, and mechanical properties of LCP on the warpage behavior of the plastic base of a memory card connector, and obtained the optimum process parameter combination.

Research Motives

In recent years, the prices of raw materials increase, the international markets compete in prices, and customers' requirements for product quality and accuracy become increasingly strict. The key factor influencing product quality is the selection of injection process parameters. Therefore, improving process parameters can improve product quality and accuracy, and increase output and yield.

This study used the 3D drawing software Pro/E Wildfire 3.0 to draw the model of a plastic ram, and uses professional mold flow analysis software Moldflow Plastics Insight 6.1 for gate location, runner balance analyses,

and the settings of various process parameters. The Taguchi orthogonal array was combined with ANOVA to determine significant control factors, including plastic melting temperature, injection filling time (injection speed), packing pressure, and packing time. In flow analysis, cool analysis, and warpage analysis, a genetic algorithm with the global optimum was combined with an artificial neural network to obtain the optimum process parameter combination, thus, enabling the optimization of product warpage, field engineers reducing errors in production, and reducing the time and cost of adjusting process parameters for mold testing.

Experimental Design

Taguchi experimental design

Analysis of variance (ANOVA).

ANOVA (Montgomery, 2010), (Genichi Taguchi, 2003) is a statistical test method, which aims to determine significant factors by statistical testing. The procedure of ANOVA is to resolve the total sum of the squares of observed values of a sample to their mean difference (i.e. total variation) of the square sum caused by factors, and then the square sum is divided by DOF to obtain the variance. Therefore, the accuracy of experimental analysis can be increased by importing ANOVA into an experimental design.

Related computing equations are expressed, as follows:

Total sum of squares: □

$$SS_T = \left(\sum_{i=1}^a \sum_{j=1}^n y_{ij}^2 \right) - n \times r \times \bar{y}^2 \quad (1)$$

$$\text{Total DOF: } DOF_{\text{Total}} = n \times r - 1 \quad (2)$$

If a factor has M levels, the DOF of the factor is M-1, and the factorial effect square sum (SS_{Factor}) and factor DOF (DOF_{Factor}) can be expressed as the following equations:

Factorial effect square sum SS_{Factor}

$$\text{tor} = \frac{n \times r}{M} \sum_{k=1}^M (\bar{y}_k - \bar{y})^2 \quad (3)$$

$$\text{Factor DOF } DOF_{\text{Factor}} = M - 1 \quad (4)$$

The error term square sum (SS_{Error}) and error term DOF (DOF_{Error}) can be expressed as:

$$\text{Error term square sum: } SS_{\text{Error}} = SS_{\text{Total}} - SS_{\text{Factor}} \quad (5)$$

$$\text{Error term DOF: } DOF_{\text{Error}} = DOF_{\text{Total}} - DOF_{\text{Factor}} \quad (6)$$

Where:

n×r means there are n groups of experiments, and each group of experiments repeats r times

M is the level number

\bar{y} is the average response value

\bar{y}_k is the response value of the factor at level k

ANOVA is based on (F_{test}) statistics calculation, which tests important influential factors, as analyzed by the Taguchi experiment in statistics. The (F_{test}) value is used to evaluate the importance of factor influence; if the (F_{test}) statistic is greater than confidence level F_α, it means the factor influence is greater than the influence of experimental errors and interaction.

$$F \text{ statistic: } F_{\text{test}} = \frac{Var_i}{Var_{\text{Error}}}, \text{ where } i=A,B,C\dots \quad (7)$$

The variance of the error term is subtracted from the square sum of the various factors,

multiplied by DOF of the factor, and divided by the total sum of squares, thus, the percentage ρ_F of various factors to system variation can be obtained.

$$SS_i = SS - \text{Var}_{\text{Error}} \times (\text{DOF})_i, \text{ where } i=A, B, C, \dots, e, T \quad (8)$$

$$\rho_F = \frac{SS_i}{SS_T} \times 100\% \quad (9)$$

Process of Taguchi experimental design analysis.

1. Select quality characteristics:

This experiment aims to optimize the warpage amount of plastic chair pads; therefore, the warpage amount is selected as quality characteristics.

2. Determine the ideal function of quality characteristics:

The Taguchi experimental design method judges quality and robustness, which can be obtained from the signal to noise ratio, i.e. S/N ratio. Higher S/N ratio represents better quality. The unit is decibel (dB), and appropriate S/N ratios are determined for analysis according to different quality characteristics.

3. Determine experimental control factors, levels, and appropriate orthogonal array:

This experiment selects 6 experimental control factors, which are plastic melting temperature, mold temperature, injection filling time, packing pressure, packing time, and cooling time. This experiment has 6

experimental control factors and 5 experimental levels; therefore, the $L_{25}(5^6)$ orthogonal array is selected.

The orthogonal array symbols are described, as follows:

$$L_a(b^c) \quad (10)$$

L: Orthogonal array (L is the first letter of Latin Square)

a: Number of Taguchi experiments

b: Number of levels that can be configured for experimentation

c: Maximum admissible number of factors

Artificial neural network

The artificial neural network (Yeh, I.C., 2009), (Yeh, I.C., 2004) refers to an information processing system imitating a biological neural network, and is a sort of computing system, which includes software and hardware. It uses numerous simple artificial neurons to imitate the capability of a biological neural network. The artificial neuron is a simple simulation of a biological neuron, which obtains information from the external environment or other artificial neurons, and after very simple calculation, the

result is exported to the external environment or other artificial neurons.

The basic structure of the artificial neural network (Yeh, I.C., 2004) can be divided into two major categories, recurrent network and feed-forward network. The recurrent network is the most representative Hopfield network, while the feed-forward network is a type of hierarchical network, and the back-propagation neural network is the most representative. The architecture of a back-propagation neural network is divided approximately into three layers, input layer, hidden layer, and output layer. The input layer receives external information or variables, which are linearly converted and sent to the hidden layer for processing. The hidden layer uses nonlinear conversion to process the correlation between messages or variables. The hidden layer can be a single-layer or multi-layer according to requirements or design. The output layer exports the hidden layer processed information by linear conversion.

Genetic algorithm

The main advantage of the genetic algorithm is that the extremum search process is relatively unlikely to obtain a local extremum. The parent generation with excellent characteristics among the species is selected, usually calculated in the binary mode. The opera-

tional method is that the parameter values in the parameter search area are randomly selected, and coded as a binary element string, in order to simulate biological chromosomes. Fitness is calculated according to chromosomes, and through selection, crossover, and mutation, the purpose is to select the better chromosomal fitness, as the chromosome with higher fitness has higher opportunity to pass down genes to more excellent offspring. The offspring becomes the next parent generation, and its next offspring is determined by genetic algorithm, this process is repeated till the population size with optimum fitness is determined. With the development of computing power and practical application demands, the genetic algorithm has been extensively used in physical, engineering, and medical fields.

The simulation analysis in this study used CAD Pro/Engineer Wildfire software to draw the ram model, and simulation analysis software Moldflow Plastics Insight 6.1 was used to simulate the filling state, packing distribution, temperature distribution, and cooling efficiency of the melt-front in the actual cavity, which is combined with the Taguchi experimental design method to help analyze the effect of different process parameters of ram on product warpage, and determine the optimum process parameter combination. The process of simulation analysis is as shown in Figure 1.

Experimental Method

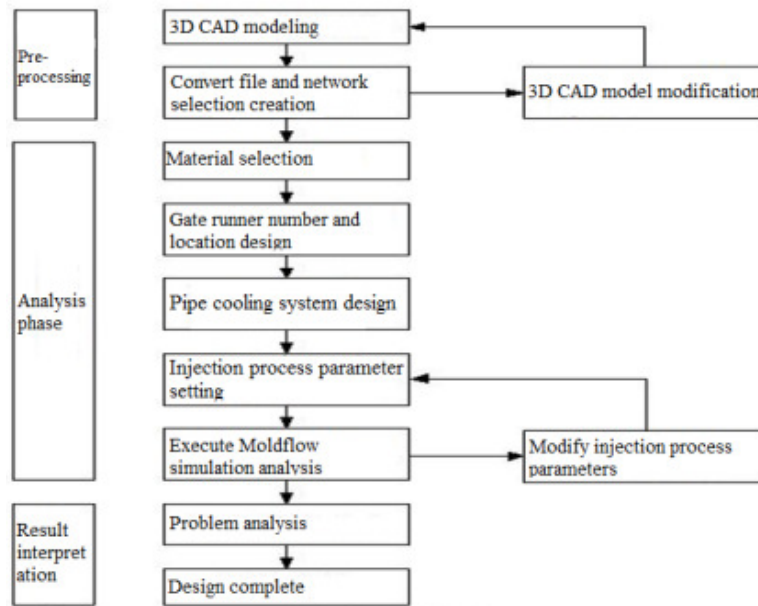


Figure 1 CAE analysis process

Main analytic types of Moldflow

1. Gate analysis

When the model has one or multiple gates, the system automatically analyzes the optimum location of additional gates.

2. Window analysis

Window analysis defines the range of process parameter conditions for producing acceptable products.

3. Fill, Flow, Pack analysis

Fill+pack can help designers determine reasonable numbers and locations of gates and runners, balance the runner system, and evaluate the process parameter conditions in order to obtain the optimal packing stage

settings to provide a sound molding window; predict injection pressure, clamping force, and molten material flow front temperature; determine the probable locations of weld lines and gas cavities, as well as filling time, pressure, and temperature distribution; and determine and correct the potential quality defects of plastic part shrinkage and warpage. Flow analysis can analyze the flow of molten plastic into the mold, and optimize the layout of the cavity and selection of material, as well as the fill and pack process parameters.

4. Runner balance analysis

Runner balance analysis helps judge whether the runner is balanced or not, and gives balance schemes for one or a combination of mold multiple cavities, if the plastic melt can

simultaneously reach and fill the various cavities of a mold, the gating system is balanced.

5. Cool analysis

Cool analysis constructs the models of the mold cooling circuit, insert, grid, and pattern, and analyzes mold cooling system efficiency. The influence of the cooling system on the flow process is analyzed, and the layout and working conditions of cooling water channels are optimized. Cooling is combined with fill+pack, and the dynamic injection process can be completely known.

6. Warpage analysis

Warpage analysis analyzes the warpage of the overall plastic parts, and indicates the first cause of warpage, and its corresponding improvement. There are three factors influencing product warpage, including plastic shrinkage, nonuniform cooling, and molecular orientation. In the warpage analysis of Mold-flow, the effects of the three variables on product warpage amount can be separated, meaning the analyzer can determine problems more efficiently in order to adjust the molding process condition parameters, predict the mold core shift caused by nonuniform pressure distribution, clarify the cause of warpage, and check where warpage has the tendency to occur, thus, mold design, material selection, and process parameters can be optimized to control plastic part deformation before mold creation.

5.2 3D CAD modeling

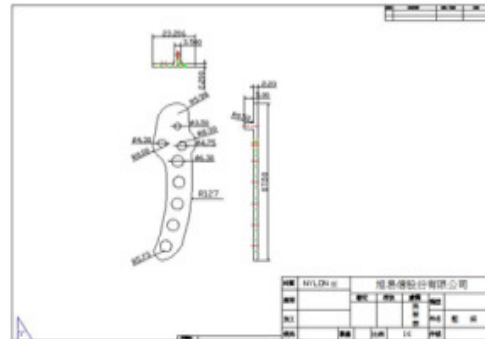


Figure 2 Ram plastic part CAD dimension design drawing

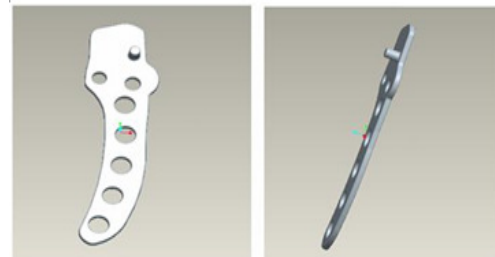


Figure 3 Ram plastic part PEO/E 3D model

The ram plastic part model is designed using 3D drawing software Pro/Engineer Wildfire, and the shape and runner design size are as shown in Figures 2 and 3. The maximum length of the model is 70.94mm, the thickness is 2.2mm, and Pro/Engineer Wildfire can save the drawn graphs as various files. As the analytical software uses fusion mesh, the graphics file must be saved as STL in order to avoid errors when the graphics file is imported into the analytical software to divide the mesh. If the midplane mesh is used, the IGES form is required.

*Mesh selection and healing of defects
Mesh type.*

Moldflow MPI has three mesh types, Midplane, Fusion, and 3D. The mesh type is adopted according to the analytic type.

1. Midplane

The Midplane model is formed of the triangular elements of three nodes, and the mesh is created in the single-layer mesh formed in the middle of the model wall thickness.

2. Fusion

The Fusion model is formed of the triangular elements of three nodes, which is different from Midplane, and is created on the undersurface of the model.

3. 3D

The 3D model is formed of tetrahedral elements, and each tetrahedral element consists of 4 triangular elements of the Midplane model. The 3D mesh can simulate a 3D runner more accurately. (Wang, W.B., 2008) The subject of this research is sheet objects with an average thickness of 2.48 mm, thus, the Fusion mesh is the most appropriate and the analysis result is more accurate.

Mesh division.

Table 1 Match ratio of five meshes

	Mesh edge 2.4	Mesh edge 2.2	Mesh edge 2.0	Mesh edge 1.8	Mesh edge 1.6
Maximum aspect ratio	27.232	15.5657	16.857	15.657	16.611
Match percentage	89.70%	90.70%	91.90%	92.00%	91.80%
Reciprocal percentage	83.80%	86.10%	88.30%	87.30%	88.10%

Mesh division is implemented after the mesh type is selected. The standard mesh division is that the mesh side length shall be over the match ratio of 85%. If the mesh side length is too small, there are too many mesh elements, or the computing time is too long, the fill and pack analyses are generally implemented at >85%, if warpage analysis is >90%. Meshes of different side lengths are created for the model in order to compare and determine the optimum mesh size and mesh quality. Five meshes in side lengths of 2.4mm, 2.2mm, 2.0mm, 1.8mm, and 1.6mm are created, respectively. According to Table 1, the side lengths of 2.0mm and 1.8mm have the best match ratio, and the reciprocal percentages are compared, where the reciprocal percentage of 2.0mm is 88.3%, which is better than the reciprocal percentage of 87.3% of 1.8mm. Therefore, the 2.0mm mesh is used for subsequent analysis.

Mesh defect diagnosis and remediation.

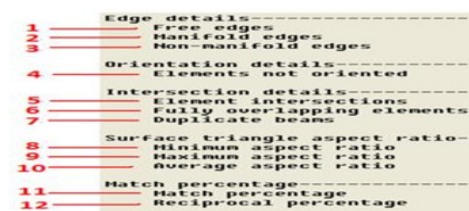


Figure 4 Mesh thickness distribution inspection

Moldflow can automatically divide mesh; however, the mesh still has defects. Therefore, mesh diagnosis (Figure 4) must be used for debugging and modification. In the overall simulation analysis process, repairing the mesh takes time, as mesh defects must be found and remedied one by one. After mesh

diagnosis, the following items must be checked: (Wang, W.B., 2008), (Chen, L.H., 2007)

1. Free Edges: the edge of the finite element is separate from the edges of other elements.

With the exception of the Midplane mesh, the number of free edges of Fusion and Solid 3D must be 0.

2. Manifold edges: the edge of the finite element contacts the edges of other elements.

3. Non-manifold edges: more than two elements have no cross edge. With the exception of the Midplane mesh, the number of free edges of Fusion and Solid 3D must be 0.

4. Elements orientation: the element is directional, the positive normal direction of element is Top, and the reverse direction is Bottom. The Top of a Fusion mesh shall be outward, the Solid 3D mesh is converted from Fusion, the Top is outward at the Fusion stage, and the Midplane mesh shall be consistent. Before analytical calculation of the Moldflow, the top surface of each element in the model shall face towards the external surface. If there is an element with a bottom surface facing towards the external surface, it is regarded as an unoriented element, which must be 0.

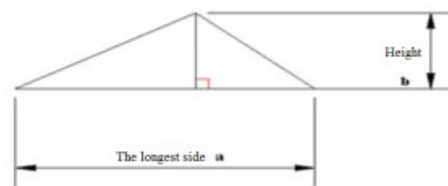
5. Elements intersection: the surface of the finite element intersects the surfaces of other elements. The elements intersection must be

0.

6. Fully overlapping elements: the mesh elements on the same plane are partially or fully overlapped. Fully overlapping elements must be 0.

7. Duplicate beams: beam elements are duplicated. The duplicate beam element must be 0.

8. Minimum aspect ratio: the ratio of the longest edge of the minimum triangular element to the height of the triangle on the edge. The minimum aspect ratio is ≤ 3 .



$$\text{Aspect ratio} = a / b$$

Figure 5 Maximum aspect ratio of triangular element (data source: [13])

9. Maximum aspect ratio: the ratio of the longest edge of the maximum triangular element to the height of the triangle on the edge, as shown in Figure 5.

In a general way, the maximum aspect ratio is the mesh defect that is most likely to occur, and the aspect ratio increases with the complexity of model. The maximum aspect ratio element must ≤ 6 , which can be 20 for special construction.

10. Average aspect ratio: average aspect ratio

of the triangular elements. Average aspect ratio is ≤ 3 .

11. Match ratio: percentage of corresponding elements on both sides of wall thickness must match each other. Fill, pack analysis >85%, warpage analysis >90%.

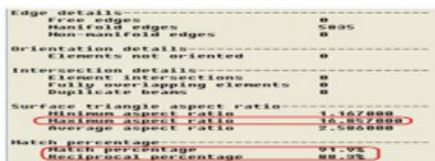


Figure 6 Mesh state before modification

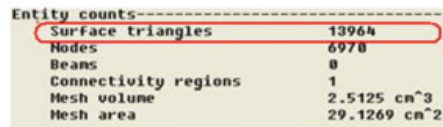


Figure 7 13964 triangular elements

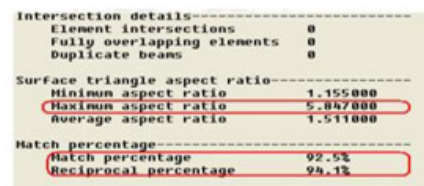


Figure 8 Mesh state after modification

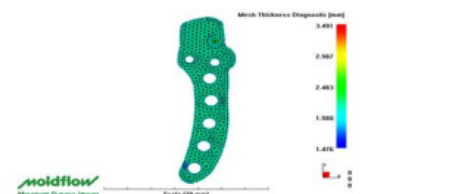


Figure 9 Mesh thickness distribution inspection

are two mesh defects detected, as shown in Figure 6, which are the maximum aspect ratio and reciprocal match ratio. The maximum aspect ratio element must be ≤ 6 , and the reciprocal match ratio warpage analysis must be >90%, in order to avoid errors in analysis. These defects can be modified by redividing the mesh, node combination, deletion, and creating triangular elements. There are 13,964 triangular elements in the modified mesh model, as shown in Figure 7. The maximum aspect ratio decreases to 5.84, the match ratio is 92.5% and the reciprocal match ratio is 94.1%, as shown in Figure 8. The mesh thickness distribution is as shown in Figure 9. A large difference in thickness will result in unstable plastic flow and nonuniform pack, thus, the product is likely to have warpage. Therefore, thickness shall be uniform, as possible. The thickness distribution of the ram model in this study is very uniform, and the average thickness is 2.48mm.

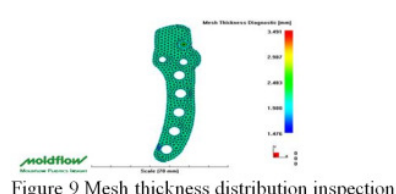


Figure 9 Mesh thickness distribution inspection

12. Reciprocal match ratio: percentage of complete correspondence of matching elements. Fill, pack analysis >85%, warpage analysis >90%.

The mesh diagnostic tool shall be used to detect defects after mesh division. There

5.4 Material selection

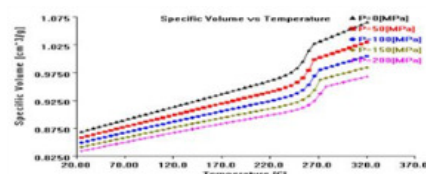


Figure 10 Zytel 330 PVT variation curves

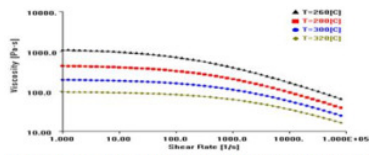


Figure 11 Zytel 330 material viscosity-shear rate curves

PA66 (Nylon 66) plastic is used as the object. The plastic is Zytel 330 plastic made by Du Pont Engineering Polymers. The pressure-specific volume-temperature is very important in the plastic molding process, as variance in pressure-specific volume-temperature (PVT) would cause variance in product quality. Figure 10 shows the variance in the PVT of plastic Zytel 330. At the same temperature, the higher the pressure, the smaller the specific volume, and specific volume increases with temperature under different pressures. The flowability of plastic melt can influence filling speed during injection. According to the viscosity-shear rate relation curve of material, for the Zytel 330 material, the relationship among temperature, shear rate, and viscosity can be obtained from Figure 11. The higher the temperature, the lower the viscosity; the higher the shear rate, the lower the viscosity.

Gate location selection analysis and runner creation

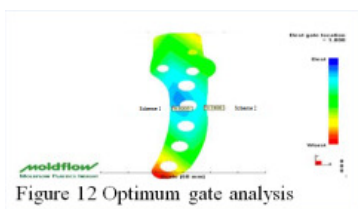


Figure 12 Optimum gate analysis

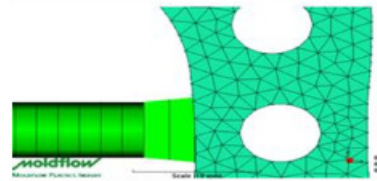


Figure 13 Create fan gate and 6mm runner

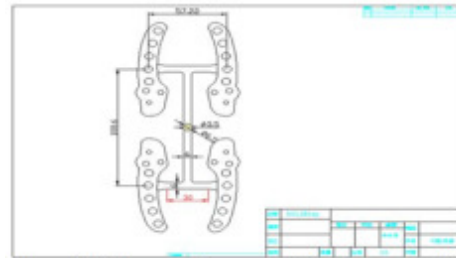


Figure 14 Scheme I H-runner CAD design drawing

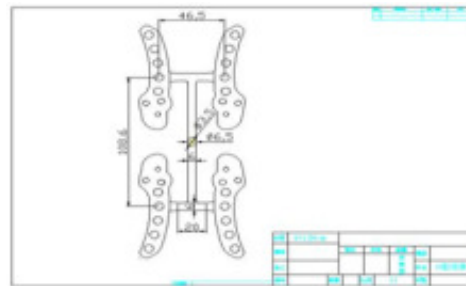


Figure 15 Scheme II H-runner CAD design drawing

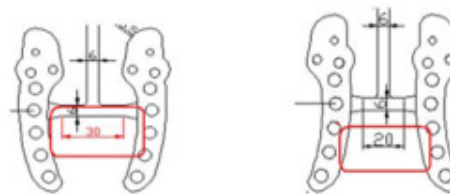


Figure 16 Scheme I runner width 30mm Scheme II runner width 20mm

The optimum gate analysis of Moldflow (Figure 12) is performed to determine two location points that are relatively suitable for setting the entrance gate. The entrance gate and runner are created in Scheme I and Scheme II (Figures 13, 14 and 15) for simulation analysis. Due to the cambered

product shape, the runner of Scheme I is wider than that of Scheme II by 10mm, as shown in Figure 16. Therefore, considering the cost, this study takes Scheme II for subsequent analysis.



Figure 17 Primary runner and sub-runner before and after modification

Table 2 Cool analysis process parameter setting

Mold temperature °C	90 °C
Melting temperature °C	290 °C
Mold open time sec	3 sec
Injection time sec	0.5 sec
Packing time sec	10 sec
Packing pressure %	80%
Cooling time sec	10 sec
Cooling water temperature °C	25 °C



Figure 18 Scheme A 4, Scheme B 6 cooling water pipes arranged in series to create mold boundary

Table 3 Coolant temperature, warpage factor analysis (better values in red)

Item	Loop coolant temperature difference °C	Loop duct temperature difference °C	Maximum temperature of product °C	Mean temperature of product °C	Total warpage amount of all factors mm
Scheme A	0.36	2.23	113.4	90.02	1.028
Scheme B	0.37	1.91	112.7	89.96	1.027

The primary runner pipe diameter is changed from 6mm to 5.61mm; the sub-runner pipe diameter is changed from 6mm to 5.4mm, as shown in Figure 17. The setting and quantity of cooling water pipes are considered according to the external dimen-

sions of product and mold configuration space limitations. There are two schemes, which use 4 and 6 cooling water pipes, respectively. The water pipe diameter is 10mm, the cooling fluid is 25°C water, and the process parameters are as shown in Table 2. Scheme A uses 4 cooling water pipes arranged in series. Scheme B uses 6 cooling water pipes arranged in series (Figure 18), to analyze the coolant temperature and warpage amount of a product. Table 3 shows that the data of Scheme B are better than Scheme A. Therefore, this study will take the 6 cooling pipes of Scheme B for subsequent analysis.

Short shot experiment

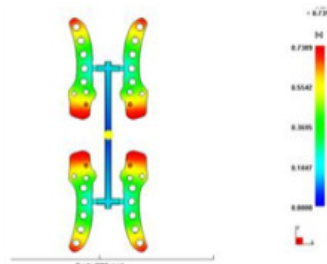


Figure 19 Computer numerical simulation (filling ratio 100%)



Figure 20 Injected object (filling ratio 100%)

According to the short shot matching result, the results of Moldflow simulation calculation, and an actual injection filled

cavity, the Moldflow simulated filling behavior is very close to actual short shot experiment, thus, the purpose of the experiment is attained, as shown in Figures 19 and 20.

Taguchi experimental design parameters and levels

Table 4 Level design for control factors

Level design for control factors					
Control factor	Level 1	Level 2	Level 3	Level 4	Level 5
A(plastic melting temperature) (°C)	270	280	290	300	310
B(mold temperature) (°C)	70	80	90	100	110
C(injection time) (S)	0.4	0.5	0.6	0.7	0.8
D(packing pressure) (%)	70	75	80	85	90
E(packing time) (S)	5	6	7	8	9
F(cooling time) (S)	8	9	10	11	12

Table 5 L₂₅(5⁶) orthogonal array for injection parameter simulation analysis

L ₂₅ (5 ⁶) orthogonal array (injection parameter simulation analysis)						
Orthogonal array group	A	B	C	D	E	F
1	270	70	0.4	70	5	8
2	270	80	0.5	75	6	9
3	270	90	0.6	80	7	10
4	270	100	0.7	85	8	11
5	270	110	0.8	90	9	12
6	280	70	0.5	80	8	12
7	280	80	0.6	85	9	8
8	280	90	0.7	90	5	9
9	280	100	0.8	70	6	10
10	280	110	0.4	75	7	11
11	290	70	0.6	90	6	11
12	290	80	0.7	70	7	12
13	290	90	0.8	75	8	8
14	290	100	0.4	80	9	9
15	290	110	0.5	85	5	10
16	300	70	0.7	75	9	10
17	300	80	0.8	80	5	11
18	300	90	0.4	85	6	12
19	300	100	0.5	90	7	8
20	300	110	0.6	70	8	9
21	310	70	0.8	85	7	9
22	310	80	0.4	90	8	10
23	310	90	0.5	70	9	11
24	310	100	0.6	75	5	12
25	310	110	0.7	80	6	8

The control factors analyzed in this study are plastic melting temperature (A), mold temperature (B), injection filling time (C), packing pressure (D), packing time (E), and cooling time (F), and five levels of control factors are determined, with the level design

as shown in Table 4. As the selected control factors have six parameter factors, the L₂₅(5⁶) orthogonal array is used (Table 5), parameter setting values corresponding to the orthogonal array are substituted in Moldflow for simulation analysis, and the experimental values of warpage are obtained.

Results and Discussion

The results and discussion aim at the following subjects:

L₂₅(5⁶) orthogonal array simulation results

Table 6 Simulation result data

Total warpage variation of simulation groups			
Simulation group	Warpage variation	MSD	S/N (dB)
1	1.079	1.16424	-0.6604
2	1.066	1.13636	-0.5551
3	1.054	1.11092	-0.4568
4	1.043	1.08785	-0.3657
5	1.032	1.06502	-0.2736
6	1.035	1.07123	-0.2988
7	1.032	1.06502	-0.2736
8	1.025	1.05063	-0.2145
9	1.077	1.15993	-0.6443
10	1.047	1.09621	-0.3989
11	1.016	1.03226	-0.1379
12	1.057	1.11725	-0.4815
13	1.051	1.1046	-0.4321
14	1.024	1.04858	-0.206
15	1.019	1.03836	-0.1635
16	1.037	1.07537	-0.3156
17	1.032	1.06502	-0.2736
18	1.006	1.01204	-0.052
19	1.011	1.02212	-0.095
20	1.042	1.08576	-0.3574
21	1.021	1.04244	-0.1805
22	0.9916	0.98327	0.07327
23	1.027	1.05473	-0.2314

Table 7 Taguchi ANOVA of warpage S/N ratio

Taguchi ANOVA of warpage S/N ratio									
Control Factor	Level 1	Level 2	Level 3	Level 4	Level 5	Variance (SS)	DOF	Variance (F ₀)	Contribution (%)
A(plastic melting temperature) (°C)	-0.46233	-0.36603	-0.28418	-0.2187	-0.15691	0.2909808	4	0.07252202	39.04747808
B(mold temperature) (°C)	-0.31864	-0.30211	-0.27734	-0.3068	-0.28326	0.00581789	4	0.001454471	0.78319931
C(injection time)(S)	-0.24881	-0.26877	-0.28972	-0.32	-0.36081	0.0388639	4	0.009715976	5.231298734
D(packing pressure)(%)	-0.475	-0.38493	-0.29163	-0.2071	-0.12954	0.37788196	4	0.094470489	50.86502515
E(packing time)(S)	-0.35699	-0.32245	-0.32256	-0.2761	-0.26003	0.01600578	4	0.004001446	2.154488134
F(cooling time)(S)	-0.33681	-0.3027	-0.30139	-0.2813	-0.26576	0.01423557	4	0.003563992	1.918609982
Total						0.74291118	24		100

Moldflow software is combined with orthogonal array L₂₅(5⁶) for 25 analyses in order to obtain the warpage result (Table 6)

and Taguchi ANOVA of the warpage amount S/N ratio (Table 7).

Network parameter optimization of Taguchi method + artificial neural network

The PCNeuom3.5 program developed by Yeh [Yeh,I.C] is used. It is a complete artificial neural network architecture executed in DOS, where the optimum artificial neural network parameters can be obtained using the Taguchi experimental design method.

Table 8 L₉(3⁴) orthogonal array

	Hidden layer I number of artificial neurons (A)	Number of learning cycles (B)	Learning rate (C)	Momentum factor (D)	Training example E ₂₅₂₅	MSD	SN ratio(db)
1	1	1	1	1	0.01589	0.0003	35.978
2	1	2	2	2	0.01464	0.0002	36.689
3	1	3	3	3	0.01016	0.0001	39.862
4	2	1	2	3	0.01492	0.0002	36.525
5	2	2	3	1	0.01363	0.0002	37.31
6	2	3	1	2	0.01419	0.0002	36.96
7	3	1	3	2	0.01388	0.0002	37.152
8	3	2	1	3	0.01299	0.0002	37.728
9	3	3	2	1	0.01088	0.0001	39.267

Table 9 Network parameter S/N ratio response table

	Hidden layer I number of artificial neurons (A)	Number of learning cycles (B)	Learning rate (C)	Momentum factor (D)
Level 1	37.51	36.551	36.889	37.518
Level 2	36.932	37.242	37.494	36.934
Level 3	38.049	38.697	38.108	38.038
Effect	1.117	2.146	1.219	1.104
Rank	3	1	2	4

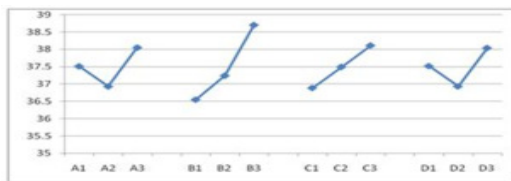


Figure 21 S/N ratio response graph

The average S/N ratio of network parameter levels is calculated by L₉(3⁴) orthogonal array in Table 8, and the parameter effect values are obtained, as shown in Table 9. The maximum average S/N ratio level of network parameters is good, and the influence of

various network parameters on the network ERMS test is judged according to the effects. Figure 21 shows that the optimal result is A3B3C3D3, i.e. optimum artificial neural network parameters are one hidden layer, 10 neutral elements, 30000 learning cycles, learning rate of 10, and momentum factor of 0.8.

Process parameter optimization of artificial neural network + genetic algorithm

Table 10 Optimum parameter combination of various generations and corresponding warpage values

Generati on	Plastic temper ature (°C)	Injectio n time (Sec)	Packin g pressure (%)	Packin g time (Sec)	Modifi on simulat ed warpage value (mm)	Artifici al neural networ k predict ed value (mm)	Error rate (%)
1	309	0.6	90	8	1.008	1.003	0
2	308	0.4	87	6	0.9988	1.001	0.002398
3	308	0.4	87	6	0.9986	1.001	0.002398
4	308	0.4	87	6	0.9986	1.001	0.002398
5	308	0.4	87	6	0.9986	1.001	0.002398
6	308	0.4	87	7	0.9981	0.9999	0.0018
7	308	0.4	87	7	0.9981	0.9999	0.0018
8	307	0.4	87	7	0.9978	0.9994	0.001801
9	307	0.4	87	7	0.9978	0.9994	0.001801
10	307	0.4	87	7	0.9978	0.9994	0.001801
11	308	0.4	87	8	0.9978	0.9992	0.001401
12	308	0.4	87	8	0.9978	0.9992	0.001401
13	308	0.4	87	8	0.9978	0.9992	0.001401
14	308	0.4	87	7	0.9989	0.9987	0.001802
15	308	0.4	87	7	0.9989	0.9987	0.001802
16	308	0.4	87	7	0.9989	0.9987	0.001802
17	308	0.4	90	7	0.995	0.9959	0.000904
18	308	0.4	90	7	0.995	0.9959	0.000904
19	308	0.4	90	7	0.995	0.9959	0.000904
20	308	0.4	90	7	0.995	0.9959	0.000904
21	308	0.4	90	9	0.9935	0.9944	0.000905
22	308	0.4	90	9	0.9935	0.9944	0.000905
23	308	0.4	90	9	0.9935	0.9944	0.000905
24	308	0.4	90	9	0.9935	0.9944	0.000905
25	308	0.4	90	9	0.991	0.9934	0.002416
26	308	0.4	90	9	0.991	0.9934	0.002416
27	308	0.4	90	9	0.991	0.9934	0.002416
28	309	0.4	90	9	0.9907	0.9929	0.002216
29	309	0.4	90	9	0.9907	0.9929	0.002216
30	309	0.4	90	9	0.9907	0.9929	0.002216
31	309	0.4	90	9	0.9907	0.9929	0.002216
32	310	0.4	90	9	0.99	0.9924	0.002418

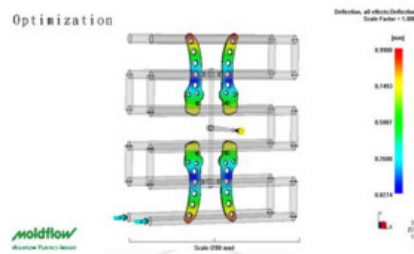


Figure 22 Simulated warpage tendency of optimum process parameter combination

The artificial neural network is combined with a genetic algorithm for process param-

eter optimization. This study uses software package Matlab to modify the genetic algorithm program developed by Chou (Chou, P.C., 2005) and the parent generation gene combination is exported according to the aforesaid genetic algorithm execution steps, and then decoded and imported into the trained back-propagation neural network to predict the warpage amount. The predicted warpage amount is imported into the user-specified fitness function in order to calculate fitness, which is imported into the Matlab genetic algorithm program; and reproduction, crossover, and mutation programs are executed to generate the next offspring gene combination, which is repeated till the optimum process parameters are determined. Table 10 shows optimum parameter combinations of various generations, as well as their corresponding warpage values, where it is observed that the warpage amount decreases as the generation evolves. After 32 generations, the restricted area of process parameters is reached, and calculation is stopped. The corresponding optimum process parameter combination is plastic melting temperature of 310°C, injection time of 0.4 seconds, packing pressure of 90 %, and packing time of 9 seconds. The Moldflow simulation analysis result of the parameters shows that the total warpage amount is 0.99mm, which is better than any parameter simulation combination in the Taguchi L₂₅(5⁶) orthogonal array. Therefore, this group of parameters is the optimum parameter values of this experiment. Figure 22 shows the simulated total warpage ten-

dency of the optimum parameters.

Matching result of measured warpage amount of actual injection product and simulation calculation

Table 11 Initial process parameter conditions

Plastic temperature(°C)	Injection time(Sec)	Packing pressure(%)	Packing time(Sec)	Mold temperature(°C)	Cooling time(Sec)	Moldflow simulated warpage value (mm)
240	0.4	70	5	70	8	1.079

Table 12 Optimum process parameter conditions

Plastic temperature (°C)	Injection time(Sec)	Packing pressure(%)	Packing time(Sec)	Mold temperature(°C)	Cooling time(Sec)	Moldflow simulated warpage value (mm)
310	0.4	90	9	90	12	0.99

Table 13 Measured data of real object warpage values of initial process parameters

Sample	Z1 warpage value	Z2 warpage value	Z3 warpage value	Average
1	1.896	1.91	1.891	1.899
2	1.954	1.935	1.92	1.936
3	1.985	2.005	1.946	1.979
4	1.935	1.915	1.896	1.915
5	1.897	1.912	1.895	1.901
Total average				1.926

Table 14 Measured data of real object warpage values of optimum process parameters

Sample	Z1 warpage value	Z2 warpage value	Z3 warpage value	Average
1	1.415	1.436	1.423	1.425
2	1.445	1.441	1.475	1.454
3	1.416	1.438	1.43	1.428
4	1.425	1.413	1.406	1.415
5	1.398	1.406	1.412	1.405
Total average				1.425

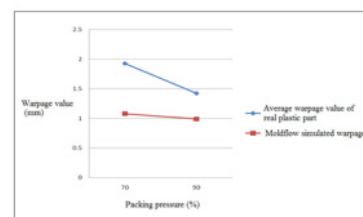


Figure 23 Moldflow calculated and actual injection warpage value trend analysis

The equipment for measuring warpage amount in this experiment is the 3D precision measuring machine, as made by the TESA Group, and the model is Micro-Hite 3D. The measurement accuracy is 0.001mm, the ruby probe on the Z-axis moves within the spatial limits formed by orthogonal X, Y, and Z

directions, is based on the contact measurement and triaxial displacement measurement system (optical scale), the computer system calculates the X, Y, and Z coordinates of the workpiece for accurate measurement, and the dimensional accuracy and geometric accuracy are measured. The contact probe for this measurement is the ruby probe with a diameter of 3.0 mm. The 3D measurement platform is the calibration reference plane, and the measuring points are z1 to z3. The actual object warpage amount is measured in the Z-direction, and the unit is mm. The molding conditions of simulation calculation (Tables 11 and 12) are applied to actual injection experiments, where five plastic parts are randomly sampled. In the 3D measurement result of the actual object warpage amount, the average warpage amounts of the optimum process parameter conditions are 1.926mm and 1.425mm, respectively (Tables 13 and 14). The average warpage amount of the actual injection is greater than the warpage amount calculated by Moldflow, and classified as a measurement error. The warpage values of simulation calculations and actual injections are drawn into the trend analysis (Figure 23). The plastic part warpage amount can be greatly improved by applying the optimum process parameter conditions, as calculated by the genetic algorithm, to the actual injection, and the average warpage amount can be reduced by 0.501mm.

Conclusion

This study used Moldflow software for mold flow analysis, and the Taguchi orthogonal array + ANOVA to select six factors from the factors influencing plastic ram warpage as control factors. The four key factors influencing warpage were determined. The artificial neural network was combined with the genetic algorithm for process parameter optimization. The conclusions of this study are described, as follows:

1. Molded plastic products have weld junction problems, thus, the weld junction should be prevented from occurring in the vulnerable spot of a product. In mold design, Moldflow can be used for mold flow analysis. As the location of the weld junction is predicted in advance, the weld junction can be prevented from occurring in the vulnerable position of a product through the gating system location design, or changing the process parameters, such as increasing the mold temperature. If the vulnerable spot of a product cannot evade a weld junction, it can be equipped with additional heating pipes to improve the quantity and strength of weld junction.

2. In the cooling water pipe arrangement analysis, 4 cooling water pipes are compared with 6 cooling water pipes. The arrangement of 6 cooling water pipes has the best cooling effect and warpage amount. Therefore, the arrangement of 6 cooling water pipes with smaller warpage amount is selected for

simulation analysis.

3. In terms of this study, the factors influencing the warpage in descending order of importance are, as follows: packing pressure > plastic melting temperature > injection filling time > packing time > cooling time > mold temperature. Packing pressure is the most influential factor. The optimum parameters are packing pressure 90%, plastic melting temperature 310°C, injection filling time 0.4 sec, and packing time 9 sec.

4. The plastic part warpage amount can be greatly improved by using the optimum process parameter conditions, as calculated by the genetic algorithm in actual injection, and the average warpage amount can be reduced by 0.501mm.

5. This study proposes a feasible experimental procedure, which provides a reference frame for injection molding engineers to set plastic product parameters in the future.

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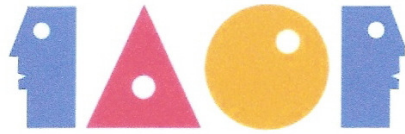
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EXPLORING THE EFFECT OF THE "BECOME ATTRACTIVE MATCH-UP" WITH CELEBRITY ENDORSERS

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Abstract

This research aims to explore whether the "become attractive match-up" is better than the more commonly used and researched "attractiveness match-up". This research further explored whether significant differences between the consumer groups of high and low involvement are found to expand the theoretical framework of the match-up hypothesis. The empirical study found that celebrity endorsers who were recognized as attractive yielded better effectiveness in the "become attractive match-up" than the "attractiveness match-up". No significant differences were found between these two strategies when the celebrity endorser was initially recognized as unattractive. The "becoming attractive match-up" does not show any moderating effect on either high or low involvement consumers, regardless whether the celebrity endorser was recognized as attractive or unattractive.

Key Words: Celebrity Endorser, Physical Attractiveness, Degree of Involvement, Match-Up Hypothesis, Advertising Effectiveness

Introduction

Advertising is one of the main tools used by the businesses to communicate with the consumers, with attempts to raise consumers' awareness of perceived quality, enhance consumer willingness-to-pay, and make the best purchase prediction. One of the most commonly used advertising strategies is "celebrity endorsement" (Till & Shimp, 1998). The celebrities who are well-known and liked by the public are most likely to grab the attention of the target audience and most effective in terms of conveying product information to the public. The positive images are also transferred to the endorsed brands to reinforce the brand status (Till & Shimp, 1998). However, celebrity endorsement does not guarantee effectiveness. Therefore, the industry and researchers began to focus on the factors that may explain the effectiveness of celebrity endorsement. Among the numerous factors that play a part in the effectiveness of celebrity endorsement, one of the detrimental factors is the match between the celebrity and the product (Fleck, Korchia, & Roy, 2012). The match-up hypotheses is one of the theories that explains the effectiveness of celebrity endorsement in product advertisements and "physical attractiveness" is one of the most commonly used "match-up" factors. Celebrity's physical attractiveness working with an attractiveness-related product yields "a positive impact upon product and advertisement evaluations" (Kamins, 1990).

However, contradictory results were found in the empirical studies on the effectiveness of attractive celebrity endorsers. Some cases with a good matching effect yielded no attraction effect (Caballero & Pride, 1984; Kahle & Homer, 1985; Kamins, 1990) and some cases found to have attracting effect did not have good matching effect (Till & Busler, 2000; Liu, Shi, Wrong, Hefel, & Chen, 2010). Misra and Beatty (1990) explained this contradiction: The salient endorser attribute does not match with the advertised product selling point. For cosmetics and skin care products, the main appeal is "making someone attractive". Consumers expect cosmetic products to "make them attractive" rather than presenting what is already attractive. Therefore, the best match-up for cosmetic products should be celebrity endorsers who "become attractive" after using the cosmetic product. We call it the "become attractive match-up" in this research. Whether this "become attractive match-up" is more effective than the more commonly used and researched "attractiveness match-up" is still a subject area rarely explored. This research makes an attempt to fill this gap and expand the theoretical framework of the match-up Hypothesis. Pierro et al. (2013) think that the characteristics of the audience are important moderators of the effectiveness of the advertising. Muehling and Laczniak (1988) also suggested, to more fully understand the effects of advertising on consumer behavior, research has often considered the construct of involvement." Therefore, this

research also took the dimension of consumer involvement into consideration as the moderators to explore a clearer and more complete view on the effect of the "become attractive match-up" on consumers.

Literature Review

Match-Up Hypothesis

Many researchers argued that the effectiveness of celebrity endorsers depends on the degree of congruence between the image of the endorser and the product (Kahle & Homer, 1985 ; Kamins, 1990). The more congruence existing between the image of the celebrity endorser and the product; the more positive influence is shown in the consumers' opinions on the advertisement and the product. This illustrates the famous concept of advertising studies: the Match-up Hypothesis. Many factors are involved in the match-up of an endorser and a product and "physical attractiveness" is one of the most frequently adopted factors for celebrity endorsement. The following is a brief overview on the research literature discussing the match-up between the factor of endorsers' "physical attractiveness" and "attractiveness-related" products.

Kahle and Homer (1985) manipulated the factors of celebrity endorsers' physical attractiveness, likeability and the subjects' product involvement in an advertisement for disposable razors. The result confirmed the

hypothesis. When an attractive endorser is matched up with an attractiveness related product (razor), more positive attitudes and higher purchase intention are shown as compared to the effect of less attractive celebrity endorsers. However, this research only examined one attractive product without a reference to an attractiveness-unrelated product. The effect of the-above positive match-up can be confirmed only if a match-up of an attractive celebrity endorser with an attractiveness-unrelated product is found ineffective Kahle and Homer (1985) did not test on this hypothesis.

Kamins (1990) expanded Kahle and Homer's study into the first study to fully test the attractiveness aspect of the match-up hypothesis. He manipulated physical attractiveness of the celebrity endorser (attractive / unattractive) and the type of product (an attractiveness-related product, a luxury car/an attractiveness-unrelated product, a home computer). The result: significant interactive effect was found between physical attractiveness and the type of product. The subjects had higher evaluation on the attractiveness-related products endorsed by physically attractive endorsers in terms of spokesperson credibility and the attitude toward the ad.

Caballero and Pride (1984) examined the effect of printed publications in a direct mail advertisement on consumers' purchase response through a 2 (advertisement viewer sex: male /female) × 3 (models' level of

attractiveness: high, medium and low) × 2 (model sex: male/female) experiment design. The result: The purchase rate contributed to female models with high attractiveness was significantly higher than models of low and medium attractiveness. However, no significant differences were found between the group of high attractiveness female models and the control group (ad without model). And high attractiveness male models did not bring any attractiveness effect. This result confirms the match-up hypothesis; that is, attractive model matched with attractiveness-unrelated product (book) does not yield any effect.

Liu et al. (2010) manipulated three factors: endorser's physical attractiveness (high/middle/low), endorser product match-up (high/low) and two different product types, in their investigation on the influence of the physical attractiveness of female athlete endorsers and endorserproduct match-up to the purchase intention of Chinese consumers. The results indicated that female athlete endorsers with high physical attractiveness only yielded attractiveness effect without match-up effect, but female athletes with medium level physical attractiveness only influence consumers' purchase intention in a high match-up condition.

From the above discussion, we drew a conclusion that cases in some researches yielded match-up effect without attractiveness effect and others yielded attractiveness effect

without match-up effect. Misra and Beatty (1990) explained this contradiction: the salient endorser attribute did not match with the advertised product selling point. In the practice of promoting cosmetic products, the most commonly used strategy is endorsement of attractive celebrities, but the selling point of "become attractive" is deemed higher than presenting what is already attractive. Therefore, the "transformation" of the celebrity endorser before and after using the product can be matched with the selling point of "become attractive", and such a match-up can be used to accentuate the main value of cosmetic products through visual effects. As for whether such a "become attractive" match-up is more effective than the more commonly used "attractiveness" match-up, current academic research and industrial practice have rarely touched on the subject. This research aims to fill the gap in the match-up hypothesis.

Elaboration Likelihood Model (ELM) and Involvement

The Elaboration Likelihood Model (ELM) explores the routes of persuasion that cause changes to the attitude after a consumer receives and processes information from the perceived stimulant. ELM proposed two routes. The first is the central route, which describes the message receiver as a person who has high motivation and ability to process information and tends to consider and examine the information related to the

attitudinal object in detail. The other path is the peripheral route, which describes the message receiver as a person who has lower motivation and ability to process information, neither is he capable of giving more consideration to the information received. He uses the peripheral clues to form or change attitude (Petty, Cacioppo, & Goldman, 1981).

Which route a consumer takes is mainly determined by the degree of personal involvement (Zaichkowsky, 1985). The degree of information involvement is the antecedent which leads to scrutiny of information. The higher degree the involvement; the more scrutiny is carried out (Sengupta, Goodstein, & Boninger, 1997). Involvement is the relevance of a stimulus or event to an individual's personal needs, values and interests (MacInnis & Jaworski, 1989). A consumer with a high degree of involvement uses the central route to process information. On the contrary, a consumer with a low degree of involvement tends to take the peripheral route to process information. The attractiveness of the endorser is a peripheral clue, which has a certain influence on low-involvement consumers, but no influence on high-involvement consumers. This theory has been widely accepted in the academic society. However, if the attractiveness of an endorser is matched with an attractiveness-related product, is it possible that the endorser can become the "witness" to the "after use" effect? Does it mean that such information becomes a product-relevant selling point and induces

high-involvement consumers to evaluate the true benefits of the product through the central route? Indeed, similar theories have been verified by several scholars (Petty & Cacioppo, 1980; Kahle & Homer, 1985; Schaefer & Keillor, 1997). For example, Schaefer and Keillor (1997) manipulated the factors of endorser-product match-up and the degree of consumer involvement (high/low) to verify the advertising effect of varied combinations. The results showed that consumers give higher evaluation to combinations of higher consumer involvement and better endorser-product match-up. This result provides a support to the theory that match-up is processed through the central route.

The best match-up for an attractive product is an attractive endorser. However, to certain product categories, such as cosmetics, attractiveness may be the main appeal, but "become attractive" would be a more effective appeal than "being attractive". Become attractive, "being the main claim of product benefits, the best product match-up should be an endorser who "becomes attractive (i.e. the "before" and "after" transformation presented in the advertisement, which is called the "become attractive match-up effect" in this research). This point leads us to the main discussion in this research. Is the effect of such "become attractive match-up" better than the more researched concept of "attractive celebrity endorsed matching-up with attractive products"? Does such a "become attractive match-up" have a different effect on

consumers of high and low involvement?

Hypotheses

The schema theory is one of the theories used to explain the match-up phenomenon. Schema is a cognitive structure, a summary of special concept and knowledge, and a process of continuous consolidation of past reaction and experience. People form expectations on new stimulus based on the existing schema, which influences how they handle and judge the stimulus (Fiske & Taylor, 1991). Individuals evaluate external stimulus and react with emotions and evaluation, using such cognitive structure as a standard (Mandler, 1982). And certain products, such as cosmetics, convey not only the characteristic of "attractiveness", but to a larger extent the appeal of "become attractive". Therefore, celebrity endorser who "becomes attractive" (i.e. presenting the transformation before and after) matched with "attractiveness-related" products, such as cosmetics, may be the best combination that meets the consumers' expectations. If the match-up meets consumers' expectations, maximum evaluation will be achieved; if not, consumers' evaluation is consequently discounted (Koernig & Page, 2002). Kahle and Homer (1985) also suggested that an attractive endorser matched with an attractiveness-related product has a positive influence on consumers' evaluation towards the product and the advertisement. Kamins (1990) defined "attractiveness-related products" as: Products used to enhance one's

attractiveness. This definition signals that consumers are expected to become more attractive after using the product. Therefore, the most representative attractiveness-related product is cosmetics, and presenting the "before- after" transformation in attractiveness highlights the effect of cosmetic products in the enhancement of attractiveness. In other words, the best match-up for "attractiveness is the combination of "before-after transformation" and "cosmetic product" (i.e. the "become attractive match-up" discussed in this dissertation). And the merit of such match-up (enhancing attractiveness) can be accentuated by visual effects. Based on the above deduction, this research proposes the first hypothesis H 1:

H1: The effect of celebrity "become attractive match-up" is better than the effect of "attractiveness match-up"

High-involvement consumers process information through the central route; that is, consumers deliberate and scrutinize information based on the information relevant to the target object and form or change attitude. And the information most relevant to cosmetic products is how a person "becomes attractive". Therefore, presenting how a celebrity endorser transforms from "naked face" to "enhanced attractiveness" after makeup is highly relevant to cosmetic products, since "become attractive" is the main appeal and value of using cosmetic products. Manipulation of the true merits of a product or issue

boosts cognitive effort and motivates high-involvement consumers to scrutinize the information (Petty, Cacioppo, & Schumann, 1983). And the effect of presenting the merits and benefits of cosmetic products through graphics is better than narrative descriptions (Schaefer & Keillor, 1997). In other words, graphic advertisements have better argument quality in such case, and better argument quality tends to invoke high-involvement consumers to deliberate and consider the received information in greater depth (Petty et al., 1983). High-involvement consumers not only scrutinize product arguments but also make attribution on the celebrity endorser's act of jeopardizing her public image, that is, showing her "naked face" on an ad. And such attribution tends to reinforce or discount the appeal of the product's true merit (Kamins, 1990). Dion (1972) also thinks that people interpret an individual's actions in a manner consistent with their knowledge or expectations. And people in general have certain expectations and stereotype impressions on the attractive people; they are generally deemed as more sociable, more expert-like and trustworthy with better integrity and psychological stability. Therefore, people tend to give positive attribution to attractive people and negative attribution to unattractive people (Dion, 1972). Gillen (1981) also verified that people tend to attribute favorable characteristics to attractive people and unfavorable characteristics to unattractive people. Kamins (1990) also thinks that people tend to make internal attribution to attractive people and

external attribution to unattractive people.

From the above discussion, we conclude that high-involvement consumers tend to attribute the attractive celebrity endorser's act of showing her "naked face" in an advertisement to the reason that she really loves or prefers the product she is endorsing and recommends the product to the consumers because of the merits of the product. To present the merit of "become attractive" in the product, the celebrity endorser is willing to show the "before-and-after" effect in an advertisement, so that the consumers can have a better feel on the main benefit appeals of the product. Such positive internal attribution enhances the value of the "become attractive" merit in cosmetic products. In contrary, high-involvement consumers tend to make external attribution to the motive of an unattractive celebrity endorser who shows her "naked face" in an advertisement. In other words, they think an unattractive endorser is likely to make such a sacrifice as exposing her naked face in public (jeopardizing her public image) for substantial reward. Such external attribution tends to discount the effectiveness of the message conveyed by the advertisement.

Low-involvement consumers use peripheral route to process information. They have neither the motive nor the ability to deliberate the product argument in the advertisement in meaningful depth; neither do they make attributions to the endorser's behaviors.

They only use the simple clues and their attitude towards the celebrity endorser to form an attitude towards the product. Low-involvement consumers tend to be more easily influenced by the attractive celebrity "become attractive" match-up effect than the "attractiveness" match-up effect simply because the "become attractive" match-up involves the attractive celebrity they like, and presenting the "before-and-after" effect will invoke low-involvement consumers to make a simple connection between the celebrity and the "become attractive" merit of the product.

From the above deduction, we conclude that both high-involvement and low-involvement consumers have high evaluation towards the "become attractive" effect represented by attractive celebrity endorsers, but, in terms of intensity, the effect should be higher on high-involvement consumers than low-involvement consumers because high-involvement consumers form the attitude after careful deliberation and low-involvement consumers form the attitude for simple reasons. Based on the above discussion, this research proposes the second and third hypotheses H2 and H3:

H2: The "become attractive" match-up effect represented by attractive celebrity endorsers is higher on high-involvement consumers than low-involvement consumers.

H3: No difference between the high-involvement and low-involvement

consumers in the "become attractive" match-up effect represented by unattractive celebrities.

Research Method

This research used the factorial design of the experiment method to measure the main effect and interaction effect of two and more variables. The independent variable in this research is the type of advertisement; four match-ups of celebrity endorsers with cosmetic product were examined in the experiment: "attractive celebrity endorser after makeup matched with cosmetic product", "attractive celebrity endorser before and after makeup matched with cosmetic product", "unattractive celebrity endorser before and after makeup matched with cosmetic product" and "unattractive celebrity endorser after makeup matched with cosmetic product" The degree of involvement (high/low) is the moderator, and the advertising effect (memory of the advertisement, attitude towards the product, attitude towards the advertisement, altitude towards the brand and purchase intention) is the dependent variable.

Pre-Test

The purpose of the pre-test is to select an attractive and an unattractive celebrity endorser. Nine female actors /singers wellknown in Taiwan were selected and evaluated by 40 school girls to determine the degree of beauty and attractiveness of each tested actor /singer.

Persons with the highest and lowest scores were selected as the endorsers for the experiment. The final result showed that Sonia Sui had the highest average score and Riva Chang had the lowest average score. The scores were entered into a t-test to verify whether the degree of attractiveness of the two selected celebrities reached the level of significance. The result of the t-test showed that the average score of beauty and attractiveness for Sonia Sui was 5.4000 and Riva Chang 3.0250. Both reached the level of significance ($t=6.246$, $p=0.000<0.001$). This result indicates that manipulation of the endorsers' attractiveness was highly successful.

Experiment

This research recruited 160 female college students who have used cosmetic products before and did not participate in the pre-test. All of them were students of the day and evening schools of a technical college in Taiwan. Since this research targets on testing of theories, high-homogeneity samples yield theoretical results with higher precision and, at the same time, prevent the covariance issue generated from the experiment variables and heterogeneous groups from affecting the accuracy of the experiment results. All subjects in this experiment have used cosmetic products before; therefore, they have a certain knowledge of the product. College students form a significant niche in the cosmetic market. Therefore, the sample of this experiment

was wellrepresented up to a certain degree. This experiment tested four advertisements with slightly varied design. The design elements remain the same with manipulation on the celebrity endorser (four different presentations: "attractive celebrity after makeup", "attractive celebrity before and after makeup", "unattractive celebrity after makeup" and "unattractive celebrity before and after make-up". The cosmetic brand was an invented one to prevent forming of bias from familiarity, loyalty and preference. Prior to the commencement of the experiment, an instructor explained the process to the test subjects. The test subjects were given the information that the advertisement was for a brand newly introduced into the Taiwan market and the brand distributor was seeking consumers' opinions on the design and draft of the advertisement. This was the masking objective of this experiment. Each test subject was given instruction and instructed to carefully evaluate the advertisement for three minutes before moving on to the questionnaire. After the test subjects completed the questionnaire, the instructor inquired each of the test subjects for her opinion on the objective of the advertisement and handed over a gift as a token of appreciation. None of the test subjects responded to the true nature and objective of this experiment, which means that the experiment was successfully masked and therefore biases were successfully prevented.

Result Analysis

Manipulation Checks

This research measured the subjects' perception on the physical attractiveness of the celebrity endorsers through a two-item 7-point semantic differential scale. The two items are very attractive (7 points) /very unattractive (1 point) and very beautiful (7 points)/very unbeautiful (1 point). Result of ANOVA test shows significant difference ($F=7.947$, $p=0.000 < 0.001$). The average score of attractive celebrity after makeup ($M=5.2297$) is significantly higher than the scores of unattractive celebrity after makeup ($M= 4.0833$) and unattractive celebrity before and after makeup ($M= 4.3919$). The average score of attractive celebrity before and after makeup ($M=5.2432$) is also significantly higher than the scores of unattractive celebrity after makeup ($M= 4.0833$) and unattractive celebrity before and after makeup ($M= 4.3919$). This result shows that the manipulation of celebrities' physical attractiveness in this research was highly successful. For the degree of involvement, this research adopted the post classification method, using the mean value of the subject-evaluated involvement scale ($M=4.8632$) as the standard for determination of high and low involvement. Results of the t-test shows that the degree of involvement for high-involvement subjects ($M=5.4638$) is significantly higher than the degree of involvement of the low-involvement subjects ($M=4.2292$), $t=13.224$, $p=0.000 < 0.001$. This result shows that manipulation of the degree of involvement in

this research was also very successful.

Reliability and Validity Analysis

The Cronbach' α coefficient of the five dimensions and degree of involvement in this research falls between 0.660 and ~ 0.890 ; both are larger or close to the coefficient of high reliability 0.7. This indicates that the scale has high internal consistency and reliability. For the convergent validity, factor load of the advertising effect of the five major dimensions and the degree of involvement falls between 0.540 \sim and 0.871; both are larger than 0.5. Composite reliability (CR) falls in between 0.664 \sim and 0.892; both are larger than 0.6. Average variance extracted (AVE) falls between 0.400 \sim and 0.608. Although the AVE of some variables are lower than 0.5, Fornell and Larcker (1981) think that, with composite reliability as the basis alone, the convergent validity of constructs derived by the researcher is appropriate even when over 50% of the variances are from measurement errors, provided that the factor load of all individual observational variables of the latent variables reached the level of significance and composite reliability reached 0.6. Therefore, the variables in this research have appropriate convergent validity. For discriminant validity, this research used the confidence interval method developed by Torkzadeh, Koufteros, & Pfuhoef (2003) to construct the confidence intervals of the Pearson coefficients between the dimensions. If 1 (representing complete relevance) is not

included, the result indicates that discriminant validity exists between the dimensions. This research used SEM to construct the confidence intervals of the coefficients. Under 95% confidence level, bootstrap was used to repeat the estimation 1000 times. The results indicate that the situation of confidence interval covering 1 did not occur between the dimensions in this research. Therefore, the dimensions in this research have good discriminant validity.

Hypothesis Tests

This research recruited 160 female college students who have used cosmetic products before but did not participate in the pre-test. After deleting 12 incomplete questionnaires, a total of 148 valid samples were collected. H1 of this research was examined through one-way ANOVA. Table 1 shows that the advertising effect of all five dimensions for "attractive endorser before and after makeup" are significantly "higher than "attractive endorser after makeup". The p values of all five dimensions are smaller than 0.05. This result indicates that "attractive endorser before and after makeup" matched with attractiveness-related products (cosmetics) yielded better effect than the more commonly used strategy of "attractive endorser after makeup" matched with attractiveness-related products (cosmetics).

Table 2 shows that the advertising effects of "attractive celebrity endorser before

and after makeup" on four of the five dimensions: attitude towards the product, attitude towards the advertisement, attitude towards the brand and purchase intention (except memory of the advertisement) are significantly higher than the advertising effects of "unattractive celebrity endorser before and after makeup" and "unattractive celebrity endorser after makeup". This result indicates that "attractive celebrity before and after makeup" matched with attractiveness related products (cosmetics) yielded the best effect (better than "attractive endorser after makeup", "unattractive endorser before and after makeup" and "unattractive endorser after makeup"). However, to see Table 1, the advertising effects of all five dimensions on the cases of "unattractive celebrity endorser before and after makeup" and "unattractive celebrity endorser after makeup" matched did not reach the level of significant difference. This result also meets the expectation of the match-up hypothesis. Therefore, H1 is supported.

This research set the "celebrity becomes attractive" match-up as the independent variable, degree of involvement (high/low) as the moderator and advertising effects as the dependant variable and carried out a two-way ANOVA analysis to test H2 and H3. Table 3 shows that the interaction effects between the "celebrity becomes attractive" match-ups and degree of involvement did not reach the level of significant difference on all five advertising

Table 1. t-test of the advertising effect with attractive and unattractive endorsers “before and after makeup” and “after makeup”

Independent variables / Dependent variables	Attractive endorser				Unattractive endorser			
	After makeup (1)	Before and after makeup (2)	F value	Post-hoc comparison	After makeup (a)	Before and after makeup (b)	F value	Post-hoc comparison
Memory of the advertisement	4.6216	4.9550	4.053*	(2)>(1)	4.5741	4.6754	0.302	-
Attitude towards the product	4.5000	4.8063	4.381*	(2)>(1)	4.2500	4.2281	0.011	-
Attitude towards the advertisement	4.4131	4.8456	4.362*	(2)>(1)	4.3968	4.3722	0.021	-
Attitude towards the brand	4.5568	4.7703	4.182*	(2)>(1)	4.4667	4.4842	0.010	-
Purchase intention	4.2838	4.7703	6.312*	(2)>(1)	4.1714	4.01776	0.001	-

*p<0.05

**p<0.01

***p<0.001

effect dimensions. Therefore, H2 is not supported. This result indicates that "celebrity becomes attractive" match-up (attractive and unattractive) has no significant effect on consumers' degree of involvement (high/low). Therefore, H3 is supported.

Conclusion and Discussion

The main objective of this research aims to explore whether the "become attractive" match-up effect of attractive and unattractive celebrity endorsers is better than the effect of the more commonly used and researched "attractiveness" match-up. Consumers' degree of involvement (high/low) was also tested as a moderator to explore whether the "become attractive" match-up effect varies among consumers with varied degrees of involvement. This research found that the effect of attractive celebrity "become attractive" match-up is

better than the general "attractiveness" match-up, but the effect of unattractive celebrity "become attractive" match-up yielded the same result as the general "attractiveness" match-up, that is, no effect. Therefore, H1 is supported. This result shows that, for attractiveness-related products, the "become attractive" factor matched with the main appeals and selling points of cosmetic products, i.e. "become attractive" match-up, not only conforms with consumers' stereotypical perceptions towards cosmetic products, but also conveys the main values and quality of cosmetic products through visual effects. Therefore, the advertising effect is higher than the more commonly used and researched "attractiveness" match-up. However, attractiveness-related products matched with unattractive celebrity endorsers yielded no effect, even with the "become attractive" match-up. This result conforms to the prediction of the "match-up hypothesis".

Table 2. ANOVA test of attractive endorser “before and after makeup” and unattractive endorser “before and after makeup” and “after makeup”

Dependant variables \ Independent variables	Mean value			F value	Scheffe test
	Attractive celebrity before and after makeup (1)	Unattractive celebrity after makeup (2)	Unattractive celebrity before and after makeup (3)		
Memory of the advertisement	4.9550	4.5741	4.6754	2.274	
Attitude towards the product	4.8063	4.2500	4.2281	6.233**	(1)>(2) (1)>(3)
Attitude towards the advertisement	4.8456	4.3968	4.3722	4556*	(1)>(2) (1)>(3)
Attitude towards the brand	4.8973	4.667	4.4842	3.818*	(1)>(2) (1)>(3)
Purchase intention	4.7703	4.1714	4.1776	4978**	(1)>(2) (1)>(3)

*p<0.05 **p<0.01 ***p<0.001

Consumers' degree of involvement (high/low) does not have moderating effect to the "become attractive" match-up. Therefore, H2 is not supported and H3 is supported. This result deviates from the finding of Schaefer and Keillor (1997). Schaefer and Keillor's research showed that higher consumer involvement level brings better product and endorser match-up effect, as well as higher consumer on brand attitude evaluation, and supports the idea that match-up is centrally processed. Match-ups do not have any influence on low-involvement consumers. This research, on the other hand, found that match-ups have influence on both high and low-involvement consumers. The deviation from Schaefer and Keillor's (1997) finding may be due to the fact that "become attractive" match-up highlights the product value of "become attractive" through visual effects to invoke low-involvement consumers to make

simple considerations on the product's merits with the added effect of the "peripheral clues" carried by the attractive celebrity. And enhancement of low-involvement consumers' evaluation on the advertising effects yields the same effect as high-involvement consumers making deliberated decisions. Advertising is one of the main tools used by businesses to communicate with their consumers, and celebrity endorsement is a highly common advertising strategy used in market practice, as well a recommended technique which creates effective advertising effect. Therefore, how to maximize the advertising effect of celebrity endorsers has become a focus in business practice. This research makes the following recommendations to the businesses. For cosmetic products, the effect of "become attractive" endorsed by attractive celebrities is better than the more commonly used "attractiveness" match-up. The "become

Table 3. Two way ANOVA results

Dependent Variables	Main effect analysis for the celebrity "become attractive" match-up (A)		Main effect analysis for the degree of involvement (B)		Interactive Effect (A×B)	
	F	P	F	P	F	P
Memory of the advertisement	1.870	0.176	0.115	0.735	0.428	0.515
Attitude towards the product	9.833	0.002**	0.028	0.868	0.397	0.531
Attitude towards the advertisement	7.878	0.006**	0.793	0.376	0.298	0.587
Attitude towards the brand	4.476	0.038*	0.102	0.750	2.956	0.090
Purchase intention	6.405	0.014*	0.103	0.750	0.994	0.322

*p<0.05 **p<0.01 ***p<0.001

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attractive" match-up improves consumers' perceptions and purchase intention. In the information era, consumers are exposed to numerous and high-varieties of advertisements. The "become attractive" strategy

differentiates the advertisement from the traditional "attractiveness" strategy to gain better effect and in turn maximize the effect of celebrities endorsing the merits of the products.

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