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TABLE OF CONTENTS:

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A Study of the Management of Resources and Security of Campus Networks

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Abstract

The popularity of personal computers and the flourishing derived from the Internet have led to a new stage of learning. Taiwan Academic Network (TANet) was also formed in 1990, and its function is to assist schools and research organizations to share resources with each other. Information education has become an important issue on current reforms, and thus to know the management and facilities of campus network is the premise to practice good information education. Therefore, this paper will examine the current teachers, the training organizations, the security, the resources, and the management of campus network; and recommend that the urgent matter of current information education is to add qualified teachers and to increase channels of in-service further education.

Keyword: Campus Networks, ADSL, Taiwan Academic Networks

1. INTRODUCTION

1.1 Background

With the popularity of PC and the flourishing from the Internet, information technology has been applied from hi-tech industries to daily requirements. All kinds of information interchange through the Internet. New human activities in the virtual world have been brought forth. People depend on information systems more and more; an information society has become the trend. Thus, to popularize the information education and to carry out the information capacity has become the urgent matters. In order to accelerate the basic development of information education, to promote the need of computers in families, and to open the market of information and communication, the Ministry of Education practiced the expansion of "Basic Planning of Information Education" in 1999, by means of subsidizing Taiwan's junior high schools and elementary schools on computer classrooms and campus network, and linking Taiwan Academic Network with ADSL.

The plan also subsidized teachers on the training of information application, and enabled teachers to possess the basic capacity of information. With explicit policies, sufficient facilities and channels of teacher-training, and new 9-year Integrated Curriculum, the vista of information education in elementary schools has nearly been formed well.

The expansion of "Basic Planning of Information Education" possesses some features as follows:

1. Subsidizing high schools and elementary schools on information-education facilities.
2. Subsidizing high schools and elementary schools on network facilities, and promoting remote area schools on communication.
3. Subsidizing high schools and elementary schools on teachers' training in information application.
4. Subsidizing high schools and elementary schools on information-education software and on

teaching-material resource centers.

5. Subsidizing information-promotion schools on two notebook computers.
6. Promoting TANet to high schools and elementary schools.
7. Subsidizing special schools on disability-free computer workstations.
8. Subsidizing teachers colleges on information-education facilities.

This program was expected to subsidize all junior high and elementary schools in Taiwan on computer classrooms information-education facilities and materials by June in 1999, and to achieve the goal that each student can use a computer to link TANet.

1.2 Motives

Data show that, by June in 1999, the campus network in Taiwan's junior high and elementary schools achieved above 98%. Whether in town or country, all junior high and elementary schools are equipped with fine information facilities, and are able to link TANet with ADSL of 1.5Mbps. However, after constructing new campus network, the management of network appears.

Due to lack of information professionals in junior high and elementary schools, the manipulation, management, and maintenance of computer classrooms and of campus network have been taken on by teachers who are not information professionals, or by companies. It is difficult for schools to deal with facilities breakdowns, sudden increases of the flow, abnormal messages, network obstacles, and so on. This may not only affect the teaching quality, but also become a target for hackers.

The network management in junior high and elementary schools has a great influence on the information-education promotion. Thus, the management tracing is necessary. Therefore, when the government is promoting overall network in the junior high and elementary schools and at the same time the information hasn't matured yet, the potential management problems should be paid attention so that the authorities concerned can make policies and plans for that. Then, the related organizations can establish a fine campus network to create a comprehensive learning environment of information education.

2. LITERATURE REVIEW

2.1 Discussion on Current Information Teachers

2.1.1 Information Teachers

Information teachers are the main force of pushing information education forward. Their quality is associated with the development of information development. However, the lack of information teachers causes strongly both the shortage of management on the facilities, and the difficulties to push information education. Therefore, enriching qualified teachers is the most urgent matter. Taiwan's first high-school information teachers formed in 1984. That was a training program for a group of in-service teachers to take a 6-month intense training to practice the course "Introduction to Calculator".

In other words, early information teachers did not teach their majors. The real training of information-education began just when National Taiwan Normal University set up Department of Information & Computer Education in 1985. However, the graduates were much less than the demand. Since The Law of Teacher Training passed in 1994, information teachers can be trained

in teachers colleges and ordinary universities and colleges. Thus, the source of teachers has become multi-directional.

Faced with new information technology, the Ministry of Education authorized universities and colleges to practice the information application of in-service teachers. Besides, to encourage the life-long learning for teachers and to promote teachers' quality, the Ministry of Education authorized universities and colleges to open in-service credit classes for teachers.

The Law of Teachers states that it is both right and duty of teachers to take in-service training which is to promote teachers' profession and to improve the quality of education. The

Table 1. Departments of Information Education in Teachers Colleges

Name of School	Department	Set-up Time
National Taiwan Normal University	Department of Information & Computer Education	1985
	Graduate Institute of Information & Computer Education (Master)	1991
	Graduate Institute of Information & Computer Education (Ph. D.)	1997
	Graduate Institute of Computer Science & Information Engineering	2001
National Tainan Teachers College	Graduate Institute of Computer Science & Information Edu.	1996
National Kaohsiung Normal University	Information & Computer Education Graduate School	1999
National Changhua University of Education	Graduate Institute of Information & Computer Education	2000
	Department of Information Management	2000
National Pingtung Teachers College	Department of Information Education	2000

Ministry of Education has been devoted to the life-long learning of teachers for the purpose of promoting their profession and raising the quality of education. It includes establishing systems, making regulations, integrating organizations, and increasing channels for further education. The reason for teachers to take in-service training is that a great deal of information pours in the era of knowledge explosion. Besides teaching students such information, teachers can also assist them to make choices because education is to provide information and messages to students. The function of in-service studying is to complement pre-service education, raise teachers' quality, and seek improvement on the current education problems. Therefore, in-service training assists teachers to plan their careers and to carry out their ideals of life-long learning.

2.1.2 Training Organizations of Information Teachers

Besides encouraging teachers about further education, each county and city now strives to promote information education, and to set up organizations for it, such as electronic data network centers and teachers' studying centers. The training organizations of information teachers are as follows in Table 2.

2.2 Discussion on Current Network Security

Junior high and elementary schools in Taiwan have been able to link the Internet through TANet, plus the administration computerization and the data digitalization, and then facilities and information may be exposed to outer threats. Therefore, strict protection for facilities and information on the campus has become an urgent issue for the open campus network. The outer threats can be divided into hackers and viruses. The former invades from the loop-hole of security systems to destroy all information, or to steal secrete files, or to invade other networks

based upon this invaded one. The later invades through files or e-mail, hiding and waiting for the opportune moment to destroy all facilities and information. And, the latter simultaneously spread again by files and e-mail.

Table 2 Universities/ Colleges with Education Courses

Northern	Central	Southern	Eastern
1. National Taiwan U. 2. National Taipei University 3. National Taipei University of Technology 4. National Taiwan University of Science & Technology 5. National Tsing Hua University 6. National Chiao Tung U.	1. National Yunlin University of Science & Technology 2. Tunghai University 3. Feng Chia University 4. Providence University 5. Da-Yeh University	1. National Cheng Kung University 2. National Sun Yat-sen University 3. National Pingtung University of Science & Technology 4. Chang Jung Christian University Technology	1. National Dong Hwa University 2. Tzu-Chi University
7. National Taiwan Ocean University 8. National Central University 9. Shih Hsin University 10. Chung Yuan Christian University 11. Tamkang University 12. FuJen Catholic University 13. Soochow University 14. Chung Hua University 15. National College of Physical Education & Sports 16. Taipei Physical Education College 17. National Taiwan College of Physical Education	6.National Chi-Nan University 7. National Chung Hsing University 8. Chaoyang University of Technology 9. National Chung Cheng University 10. Hung Kuang Institute of Technology 11. Chung Shan Medical University	5. Tainan National College of The Arts 6. I-Shou University 7. Southern TaiwanUniversity of Technology 8. National Pingtung Institute of Commerce 9. Tainan Woman's College of Arts & Technology 10. Chia Nan University of Pharmacy & Science 11. Kun Shan University 12.National Kaohsiung Normal University	
18. Ming Chuan University 19. Huafan University 20. Chinese Culture University 21. Shih Chien University 22. Taiwan National University of the Arts 23. National Taiwan University of Arts			

To block hackers and viruses and to ensure the security of campus network, two methods can be undertaken: the management of persons and procedures, and the management of information facilities. The former co-operates with school systems, sets up and carries out the policy of campus network security. The later takes the network disposition into consideration, and sets up security mechanisms such as a firewall. According to the "Reference Norm of TANet Linking to Junior High and Elementary Schools Network Establishment", the requirement of a firewall has to contain IP filtering, IP switching, and agent servers. Such requirements may meet the basic demands of network security, but they still cannot block all invasions.

To reinforce campus network security and to block invasions fully, security measures should be practiced. Computer facilities are taken charge, maintained, and controlled by the information department. Firewalls should be set up to prevent the computers from illegal invasions. On the security policy, the information protection measures, the policy revision and frequency should be included. To carry out the security education, concepts such as Intellectual Property and Information Accessibility should be established in junior high and elementary schools.

2.3 Discussion on Current Information Resources

The Internet has been blooming, providing people with large and diverse information and becoming a help in the daily life. The campus network enlarges learning space of teachers and students, and baptizes them with all kinds of information. Yet, the common view of people on network practice has not matured. Besides useful information, there is also full of violent and erotic information. Such inappropriate information flows in the virtual world and displays on the

screen all the time. Therefore, education network centers in every county and city assist schools to set up firewalls and demand schools to connect through the firewalls of the centers so as to block inappropriate information.

On the other hand, the Internet contributes to the currency of software and digital intellectual property. The important issue, after setting up computer classrooms and campus network, is to prevent the resources used from violating patents, the intellectual property and other rights of people.

On controlling the content of the Internet, the world of Internet is comprehensive, and the content should be graded for children's mental health. On establishing the environment of communication, the Internet provides a communication channel for schools and parents, and abundant resources and professional assistance to promote in-service teachers' profession. Moreover, the distance education exercised by the Internet overcomes the spatial limits and makes educational activities more flexible. On applying information resources, conferences and fairs can also be held through the Internet.

The information application should be popularized in junior high and elementary school, and computer-based education and network application ability should be reinforced. Schools should popularize the application of information resources and strengthen the computer-based education and network application so that each teacher can apply computer, software and resources to assist students. Besides, schools should put the Internet into each subject to integrate teaching methods and information resources, providing an interactive learning environment and improving traditional systems to promote students' creativity and learning effects.

2.4 Discussion on Current Information Manufacturers

The expansion program of the Ministry of Education provides schools and information companies with references of purchase and contracts of maintenance. The content contains the detailed statement of the purchase, the demand of environment, the range of maintenance and service, and the update of facilities. To maintain the campus network, the companies should go to the schools regularly to maintain the routers and network servers. And schools should also notify the companies if there is any breakdown.

2.5 Discussion on 9-year Integrated Curriculum and Campus Network Management

The Ministry of Education proclaimed "The Outline of 9-year Integrated Curriculum of Public Education, and decided to practice it in 2001. With swift changes and numerous problems in the society, new curriculum should be incorporated in the junior high and elementary schools to keep up with the changes and to prevent problems on the campus. The characteristic of 9-year Integrated Curriculum is to put the six issues (environmental protection, information, sexes, human right, career planning, and home economics) into the seven learning areas (languages, health & physical education, social science, arts, mathematics, nature & technology, and integrated activities.) In this way, students can develop their concern and understanding toward the issues in a pressure-free environment.

The 9-year Integrated Curriculum provides the junior high and elementary schools with sufficient network facilities. Thus, teachers can change the traditional teaching methods and organize new ones from the Internet. Traditionally, in Taiwan the students in country can not enjoy the same educational resources as those in city. The gap is quite wide. To promote equal

opportunity of education, and to balance the differences between city and country by information education, the 9-year Integrated Curriculum includes the learning of information and technology and its application on daily life, which promotes the learning efficiency and improve the life quality.

3. CONCLUSIONS

3.1 On Information Teachers

A. Graduation Department:

There is a low rate for information teachers in the elementary schools to graduate from related departments. Although the National Taiwan Normal University set up the Department of Information & Computer Education in 1985, there still is an insufficiency on information departments and on students enrolling in the departments. Information teachers who graduate from related departments contribute to the practice of campus network safety. And they can learn network safety measures, knowledge and technology of information control, and promote their own profession better than other information teachers. Both quantity and quality of information teachers influence education much more than expected. Expanding channels of training information teachers is the first mission of pushing information education. To promote the percentage of professional information teachers and to encourage professionals in information education are the bases of long-term information education. Education courses in ordinary colleges and universities are also contributive to the increase of information teachers. Schools employ information teachers graduating from related departments to promote the percentage of information teachers. And schools should also encourage teachers to exercise computer-based

education and the Internet to promote students' creativity and capability.

B. In-service Further Education:

There is an obvious low percentage showing information teachers graduate from related departments. Their long-term work experiences show the high demand of in-service further education. Information teachers of in-service further education will learn the set-up of network, the connection, the knowledge and technology of network security, and promote their profession better than others.

Although the Ministry of Education resolves to push information education and 9-year integrated curriculum, information teachers are still in shortage. The present urgency is to promote teachers' information studying. However, it is a slow strategy to overcome the shortage by increasing information departments, enlarging student numbers, or opening education courses in universities and colleges. For the time being, schools should encourage teachers to participate in-service training, and strengthen information teachers' understanding of "Safety and Standards of Computer Classrooms."

Besides, popularizing organizations should hold some camps regularly or casually to increase opportunities for further education, promote

teachers' professional abilities, and make up for the insufficiency of information teachers.

3.2 On Information Manufacturers

A. The Service Period:

The service period of information companies ranges mainly from one to three months, which means companies could serve the schools as the contracts state. Therefore, schools should be careful at choosing companies. Even after signing contracts, schools should also supervise companies to follow the contracts and to examine the network facilities and connection regularly.

B. The Cooperation:

Most schools feel satisfied with the company, which shows that most companies can follow the contracts and repair breakdowns. The cooperation degree of companies has a great influence on the establishment of network, the connection, and the maintenance. From the service, information teachers can also learn about the knowledge and technology of maintaining the network facilities.

Therefore, schools should be careful at choosing the companies. Schools should notify the companies as soon as there is any breakdown of the facilities or the links. And information teachers should also take the chances to learn more about the maintenance so that they can assist at breakdown. In this way, information teachers can help solve some or all breakdowns to restore the facilities as soon as possible.

3.3 On Regional Types

The professional ability of information teachers and the management of campus network differ from area to area. Taiwan's government used to prefer the north to the south, west to east, so that the existing gap between urban and rural areas is everywhere. The unbalanced distribution of information and resource leads to different professional abilities of teachers in different areas. And schools in different areas also present different plans on campus network.

Information teachers are the pioneers to push information education, and the campus network is the environment to practice it. To balance the development of urban and rural areas helps to promote the professional abilities of information teachers and to establish a fine campus network. Therefore, the application of the Internet crosses the limits of time and space, and thus contributes to balance the gap. Information teachers should apply the Internet to learn the information and knowledge to promote their professional abilities.

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Benefits and Risks of Social Capital – A Resource-Based Approach

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Abstract

This paper reviews concepts of social capital, resource-based view and resource dependence theory with the view of focusing on their most basic meaning as a basis for determining the benefits and risks of social capital. The benefits of social capital from the resource-based view were explored with focus on how firms achieve competitive advantage. The risks of social capital from the resource dependence perspective were likewise reviewed in the context of individual and corporate behavior. The review concluded with a recommendation for study on how to maximize benefits and reduce the risk of social capital in multidimensional situation.

Keywords: Social capital, Resource-based View, Resource dependence theory

1. Introduction

Social capital is a valuable resource that has been a focus of interest by researchers from a wide range of discipline and has even become popular beyond academic institutions. While there is a controversy as to what the term really means and the concepts it embraces, there is a need to evaluate to what extent the concept is of value to both private and government organizations or to business, political, and other entities. There is a need to define this value in terms of benefits and by way of avoidance, in terms of risks as well. To do that there is a need to clarify the basic meaning of the concept of social capital as well as resource-based view and resource-dependence theory that have both a bearing in determining benefits and risk of social capital.

2. Defining Key Concepts

2.1 Social Capital

In any society, social capital needed for success in organizational activities. Understanding of the essence of social capital results in several defining components, not always consistent. Thus, Burt (1992) defines social capital as opportunities open to individuals who cultivate relationships with others. Yet Coleman (1990) stipulates that social capital can only be realized where a relationship is complemented by similar values and norms. In either case, the purpose of social networking is to generate trust and value of the interaction facilitated by relationships (Standifird & Marshall, 2000). Importantly, this trust cannot be legislated to apply to a broader community, but depends on interpersonal relationships.

Bourdieu (1986) identified three forms of social resource: economic, cultural and social capital. Hence, social capital has two components: it is primarily connected with group membership and social networks. But just as importantly, social capital is s mutual sustained by mutual cognition and recognition. Bourdieu, in his more generalized theory on social capital, argues that enduring

benefits continue where respect, appreciation, and friendship are manifest. Bourdieu's concept of social capital differs from Coleman's concept. Coleman (1988) approached the concept of social capital in the context of family and community. He examined the relationship between social capital and the probability of academic failure. For Coleman, social capital consists of different entities, comprising social structures that facilitate certain actions, and which provide a basis for interacting with other social structures (Coleman, 1988). Social capital is different from physical capital or human capital; it is a public good, open to the limited public or membership of the community, derived from specific social structures, that is profitable to individual interests. So the academic failure may be cushioned from the abject denigration that could occur to him in the wider community. Similar safeguards are available within guanxi, though the academic failure will not be engaged in functions for which he is not ostensibly able. That is, while there may be some degree of nepotism, it will not extend to bolstering incompetence that has damaging consequences for the entire social network.

Nahapit and Ghoshall (1998, p.243) defined social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" to achieve holistic benefits from combining social capital, intellectual capital, and organizational advantage. Thus social capital generates creation of new intellectual capital; organizations, including those based on relationships, as well as organizations like firms are able to form denser social capital over competitors.

Fukuyama (1995a, 1995b) treats social capital as trust, together with the capacity for cooperation. He concludes that high levels of sociability or social capital, and loyalty enable individuals work co-operatively in the corporations collectively propel an economy towards prosperity. Though these corporations compete with one another, the internal culture, that reflects the trust and

cooperative spirit found in Guanxi, ensures the internal efficiency and productivity necessary for them to compete with rivals while contributing to the broader community.

In sum, social capital is argued from various sources. Firstly, much of social capital is embedded within networks of mutual acquaintance and recognition. Secondly, social capital is available through the contacts or connections networks bring. Thirdly, social capital can be derived from membership in specific networks, where such a membership is restricted (Nahapiet & Ghoshal, 1998). In short, from the variety of definitions of social capital, it is concluded that social relationships are a common element, as Astone et al. (1999) find, the use of term social capital to refer to the resources that emerge from one's social ties is exceedingly popular.

2.2 Resource-based View

The resource-based view (RBV) is a simple economic tool for determining a firm's resource position to attain a competitive advantage. Resource is "anything which could be thought of as a strength or weakness of a given firm" (Wernerfelt, 1984, p.172) includes tangible and intangible assets semi permanently tied to the firm. It comprises all assets, capabilities, organizational processes, firm attributes, information and knowledge acquisition, controlled by a firm that enable the firm to carry out strategies that advance its efficiency and effectiveness (Draft, 1983).

Barney (1991) defined competitive advantage as a firm's competitive position wherein any current or potential competitors are not simultaneously implementing the value creating strategy. This competitive advantage is sustained when the value creating strategy is not being simultaneously implemented and could not be duplicated by any current or potential competitors. Barney (1991) states that to be a potential source of sustained competitive advantage, a resource must have four attributes: it must be valuable, rare, imperfectly imitable, and not substitutable. A more precise definition of competitive advantage linked this to value creation and demand side concerns (Peteraf & Barney,

2003) while an analysis of sustained competitive advantage, to clarify the notion, focused on two causal conditions: uncertainty and immobility (Foss & Knudsen, 2003).

2.3 Resource-dependence theory

The impact of the environment on the organization has been at the core of organizational research with the innovative advent of social exchange (Emerson, 1962). In light of open-system strategies, central to any organizations' viability is self-stabilization in the face of disturbances stemming from the environment (Thompson, 1967). As Thompson (1967) has postulated, organizations attempt to manage their external dependencies or to control the environment. Thus, organizational structures are inevitably subject to the dynamic environment in which they exist and changes with the passing of time.

Resource dependence theory, derived from social exchange theory, contends that most organizations do not control all of the resources indispensable for survival and that they rely on other organizations to provide those resources (Pfeffer & Salancik, 1978). Pfeffer (1972) assumed that organizations as open systems become interdependent with elements in the environment when they transact with these elements. Accordingly, organizations are open systems whose structure, functioning, and fate are widely constrained by the environment (Scott, 1987). Organizations import most of their needed resources from the environment. Organizations cannot free themselves from external influences, notwithstanding that they strive to minimize environmentally induced external constraints.

Further, it is indicative of resource dependence that power relations among actors in pursuit of resources are commonly asymmetrical and that organizations endeavor to capture power, maintain autonomy, and reduce uncertainty in the context of external pressures and demands. Control over resources is significant in maintaining power and is therefore pursued by organizations. Since dependence symbolizes constraints or contingences, the challenge for organizations is to avoid

becoming submissive to elements of the environment (Pfeffer & Salancik, 1978). Adaptation to these multiple influences becomes critical for survival in that resource scarcity is a ubiquitous condition.

3. Benefits of Social Capital

From a resource-based perspective, "firms obtain sustained competitive advantages by implementing strategies that exploit their internal strengths, through responding to environmental opportunities, while neutralizing external threats and avoiding internal weaknesses" (Barney, 1991, p.99). Such a strategic perspective can be applied through focusing "on the firms as a primary context in which to explore the interrelationships between social and intellectual capital" (Nahapiet & Ghoshal, 1998, p.245) and seeing how social capital can benefit firms by facilitating acquisition of intellectual capital. Nahapiet and Ghoshal (1998) affirmed that "capital consists in a great part of knowledge and organization…knowledge is our most powerful engine of production" and acknowledged that "intellectual capital thus represents a valuable resource and a capability for action based in knowledge and knowing" (p.245). Intellectual capital exists as "socially and contextually embedded forms of knowledge and knowing as a source of value differing from the simple aggregation of the knowledge of a set of individuals" (p.246).

Uzzi (1997) found that "fine-grained information transfer benefits networked firms by increasing the breadth and ordering of their behavioral options and the accuracy of their long-run forecasts" and that "the social relationship imbues information with veracity and meaning beyond its face value" (p.46). He argues that "organizations gain access to special opportunities when connected to their exchange partners through embedded ties, such that the opportunity level is positively related to the degree to which a firm's network partners use embedded ties" (p.59). In his study of structural embeddedness, he found plausible evidence from data on network ties of the New York apparel industry that organizational performance increase with the use of embedded ties link to network

partners (p.59). Based on this, he proposed three network structures: under-embedded arm's-length network, integrated network and over-embedded network, with the integrated network structure, comprising of mostly embedded ties in the firm's 1st-order network and integration of arm's – length and embedded ties in 2nd-order network as the optimal, integrated structure (p.60). This integrated network structure results to a good number of beneficial effects both in the firm-level and net-work level (p.62).

The resource perspective proposed that growth strategy "involves striking a balance between the exploitation of existing resources and the development of new ones" (Wernerfelt, 1984, p.180). It is in the latter that social capital can contribute significantly through exploring and developing the resource generating potential of social exchange between partners. Molm, Takahashi and Peterson (2000) conducted an experimental research to test classical exchange theory that proposes that trust is the necessary component of social exchange. Their study shows that persistence and the form of social relationships matters and that "relationships characterized by both reciprocal exchange *and* the expectation of continued interaction are particularly conducive to building trust, and … can be valuable assets in even the most institutionalized economic settings" (Molm et al., 2000, p.1425). Trust is the primary element that brings about influence and by way of development, control and power.

The development of trust in reciprocal exchanges is one of the most intriguing concept and benefit of social capital. In reciprocal forms of exchange "actors individually provide benefits to each other without knowing what returns they will receive". It is only in this kind of exchange that the risk of giving without reciprocity allows true demonstration of trustworthiness and provides the conduciveness for the development of trust; something that is negated by the binding agreements that

provide assurance in negotiated exchange (Molm et al., 2000, p.1422). It is the full fruition of reciprocal exchanges that leads to the solidarity benefits between firms or between actors.

Solidarity as a benefit of social capital, however, may be achieved through other means. Adler and Kwon (2002) stated that "strong social norms and beliefs, associated with a high degree of closure of social network, encourage compliance with local rules and customs and reduce the need for formal controls" (p.29) and that "people working in more highly cohesive subunits need to be . . . more attentive to the firm's super ordinate goals" (p.30).

4. Risks of Social Capital

The conceptual model of social capital formulated by Adler and Kwon (2002) derived social capital from social relations, more specifically from "the formal structure of the ties that make up the social network" (p.23). Emerson (1962), however, remarked that "social relations commonly entail ties of mutual dependence between parties" (p.32) and that "power to control or influence the other resides in control over the things he values" (p.32). He refers to this as dependency. This relation can be balanced and unbalanced. In an unbalanced relation therein lies the risk in maintaining social capital. It requires cost, which Emerson has referred as "alteration in moral attitude", using courting relation as illustrative example. He stated that in general, cost reduction is a process involving change in values (personal, social, economic) which reduces the pains incurred in meeting the demands of a powerful other" (p.35). In an experimental test to study risk and trust in social exchange, Molm et al. (2000) noted that networks "vary substantially in the amount of imbalance they create" and "provide opportunities for both benevolent and exploitative behavior" (p.1399).

The risk of social capital is no more clearly elucidated than in the study of relationship and unethical behavior in social networks (Brass, et al., 1998). They averred that "the strength, multiplexity symmetry, and status equality of a relationship, frequency of interaction and trust provide

increased opportunities and payoffs for unethical behavior" (Brass et al., 1998, p.19). From a resource dependence perspective, any social interaction that enables actors to access resources either decreases their dependence or increases other's dependence to them and thereby acquires power. Such a scenario can be seen in higher level positions wherein they are often "the sole link between owners, boards of directors, or other outside stakeholders and other organizational personnel" and are "subject to greater opportunities and payoffs from unethical behavior" due to "less surveillance from those both inside and outside the organization". This scenario is modeled by triadic relationship involving a structural hole wherein actor A is separately linked to actor B and actor C while actors B and C are not connected. Power comes through the capture of structural whole control, and this situation increases the possibility of unethical behavior. (Brass et al., 1998, p.20-24).

In a study of embeddedness and organization networks, Uzzi (1997) illustrated the risk of embeddedness by citing the apparel retail trade in the 1980s wherein embedded relationships maintained by retail buyers with clothing manufacturers were broken when a shift from relationship buying to number buying was imposed by corporate conglomerates who buy out giant retailers resulting in permanent organizational failure (p.58). Another risk of over-embeddings is when "the social aspects of exchange" cause resource dependence by the weaker firm on the network in a way that depletes the resources of the stronger firm and cuts their capacity to rejuvenate (p.59).

5. Conclusion and Future Research

This short review suggests that the benefit of social capital centers on its capacity to provide competitive advantage through the acquisition of resources, particularly knowledge based resource, or more specifically intellectual capital, as well as other benefits accruing to firm level and network level – trust, solidarity, privilege access to resources and other economic benefits. Identifying contexts on which the risks of social capital emerge can further enhance these benefits by way of pro-active use of

this knowledge to identify contexts by which such risk can be significantly reduced. This risk primarily involved unethical behavior that normally comes with power, but it includes over dependence, which negatively alters the balance of resources. Exploring further the context by which risks arise and conducting research on how this can be averted may be an interesting recommendation for future research. How can the risks of social capitals be mitigated if not totally avoided in the various social structures on which social capital is generated? Through this and similar research the benefits of social capital may be more firmly consolidated.

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IMPACT OF CUSTOMER RELATIONSHIP MANAGEMENT (CRM) IN THE IRAN BANKING SECTOR

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ABSTRACT

The banking industry has reduced structural barriers of competition in domestic markets by abolishing interest rates ceilings on deposits and lending by financial intermediaries in the world. Iran also has not been exceptional in this case. According to the government's policy, the interest rate is going down by 9%. Earlier it used to be 22% presently these are: 15%. The introduction of technology-based solutions like CRM has differentiated companies from their customers' point of view.

CRM is a strategy where banks to build and manage long-term relationships with their customers. Researchers have shown that CRM implementation can provide better customer service, as well as improvement and management of customer expectations and loyalty (Cho et al., 2001; Reich held, 1996; Reichheld & Sassari, 1990; Romano, 2001; Winer, 2001). In this paper we explained the CRM philosophy and it's role in banking system, and have proposed a model of E-CRM for Iran's banking sector by taking into consideration their competitive environment.

KEY WORDS: CRM, E-BANKING, SERVICE QUALITY, INTERNET BANKING.

INTRODUCTION

The 80s and 90s were marked by an unprecedented development in information and communication technologies. This movement was motivated, in particular, by the need of companies to remain competitive in markets characterized by an increase in customer numbers and in the supply of services (Venkatraman, 1994). The introduction of technology-based

solutions therefore came about as a way of differentiating companies from their customers' point of view. This evolution contributed towards a change in many companies' strategies and, in particular, the relations they establish with customers (Ricard *et al*, 2001).

Several industry groups have estimated that billions of dollars are being spent on CRM annually. Gartner research suggests that there was a reduction in CRM spending between 1999 and 2003 (Rigby & Ledingham, 2004), but most estimate an increase in CRM spending. Current spending on CRM-related projects is estimated around $10 to $15 billion and experts predict future growth in CRM spending to reach $75 billion and beyond over the next several years (Chatham, 2002; Tiazkun, 1999; Winer, 2001).

In this movement, banking industry has reduced structural barriers of competition in domestic markets by abolishing interest rates ceilings on deposits and lending by financial intermediaries in the world. Iran also has not been exception. According the Government's decision, the interest rate is going down to be around 9% .Earlier it was 22% and presently its 15%.

Today's banking is not merely a function of accepting deposits, lending and money transmission, the banks have now diversified into insurance, brokering, advisory services, merchant banking, factoring and almost every legitimate financial activities. In order to survive in the present world of competition, banks' marketing strategy needs to be formulated in such a way as to woo the customers. Hence, positive customer perception has become a major thrust area for banks to increase market share that is created by CRM. This has increased the importance of identifying marketing assets in which to invest and of understanding how the assets provide potential for sustained profits in the long run (Rust, Lemon, and Zeithmal 2004). Customers are considered as a critical element of a firm's marketing assets, and the effective

management of customer assets is expected to affect firm profits directly (Bolton, Lemon and Verhoef 2004).

While addressing the issue of customer relationships, one should not forget that the banks are evolving, re-designing and delivering the best possible products and services which will strengthen the bond between them and their customers. In this context, the banks have to transform themselves into customer-centric service centers rather than transaction-processing centers or centers of interest-based services.

The CRM is a challenge, particularly in the context of Iranian banks. It does not offer a magical solution or a talisman to provide solutions to all their problems at a stroke. On the other hand, if it is developed and implemented in a proper way, it can fetch remarkable results in terms of performance and profits. For example, a 5% increase in customer retention may increase the profitability by 35% in banking business, 50% in insurance and brokerage and 125% in the consumer credit card market. Therefore, banks are now stressing on retaining customers through CRM. It does not matter whether a customer is valuable or non-valuable in terms of his financial worth. Even a common man is an important customer for a bank. But what really mater is the kind of relationship that is forged by the banks. A good relationship with them will certainly enhance the bank's image and goodwill. It even increases the bank's market share.

WHAT IS THE CRM?

CRM is the aligning of business strategy with the corporate culture of the organization, along with customer information and a supporting information technology of the customer interactions that promote a mutually beneficial relationship between the customer and the enterprise. Primarily, (CRM) is a business strategy, but it is a business strategy enabled by the

advances in technology. According to (Cunningham at. al, 2004), CRM is a strategy that integrates the concepts of knowledge management, Data mining, and Data Warehousing in order to support the organization's decision-making process to retain long term and profitable relationships with its customer.

CRM also involves the deployment of strategies, processes, and technologies to strengthen a firm's relationship with customers throughout their life-cycle from marketing and sales, to post-sales service. The motivation for CRM stems from companies' desire to increase their revenues and profitability through improved customer satisfaction and retention (Reichheld, 1996; Reichheld& Sassar, 1990; Winer, 2001).

In this era, Internet technology has transformed CRM into Electronic-CRM (E-CRM), because companies and banks can use Internet technologies to capture new customers, track their preferences and online behaviors, and customize support and services. CRM also is a strategy for banks to build and manage long-term relationships with their customers. Researchers have shown that CRM implementation can provide better customer service, as well as improvement and management of customer expectations and loyalty (Cho et al., 2001; Reichheld, 1996; Reichheld& Sassar, 1990; Romano, 2001; Winer, 2001).CRM then, complements a firm's capability to present products, quality, and services to its customer (Chen& Sukpani, 1998). By implementing CRM solutions, many firms expect to improve profitability by gaining customer loyalty, customizing offering, and lowering costs.

In CRM, Business culture should shift from product-focus to customer-focus, sales and marketing can focus on retention and increase of share of customers instead of acquisition and market share. In CRM, Customer service can identify and take advantage of cross-sell and up-sell opportunities. However, customers information does not freely flow across the enterprise, to

obtain the vision of CRM, information must move freely. This requires integration, today's banking world should employ, E-Banking, to reach the larger section of customer share, and retaining. In order to understand the significance of E-Banking in the banking sector, we will briefly explain this.

WHAT IS THE E-BANKING?

Banking: To understand E-Banking, we should know. What is the meaning of Banking? Banking means the acceptance, for the purpose of lending or investment, of deposits of money from the public, repayable on demand or otherwise, and withdraw able by cheque, draft, order or otherwise. The term banking company means any company that transacts the business of banking. In addition, the banking industry performs various functions. Some of the functions are: accepting deposits from public/others (Deposits), Lending money to public(Loans), Transferring money from one place to another (Remittances), Acting as trustees, Acting as intermediaries, Keeping valuables in safe custody, Collection business and Government business.

E-Banking: A combination of the two words, Electronic technology and banking, is a process by which a customer performs banking transactions electronically without visiting a brick-and-mortar institution. It involves an extensive use of Information technology that eliminates the need for direct recourse to the bank by the customer. The emergence of E-banking has enabled the banks to offer real-time transactions and integrate all customer related functions. Now a day's banks are utilizing the new technology to provide better technology and convenient access to its customers.

Suganthi et al. (2001) conducted the review of Malaysian banking sites and revealed that there are various psychological and behavioral issues as trust, security of internet transactions, reluctance of change and preference for human interface which appear to impede the growth of

internet banking. Amin Sulaiman et al (2005) concluded that the adopters perceive E-banking to be an easy and convenient way and carry out their E-banking transactions either from their homes or offices, also, the age, income and job positions held influenced E-banking adoption. Higher adoption was seen amongst younger persons, persons with high salaries and those holding higher positions.

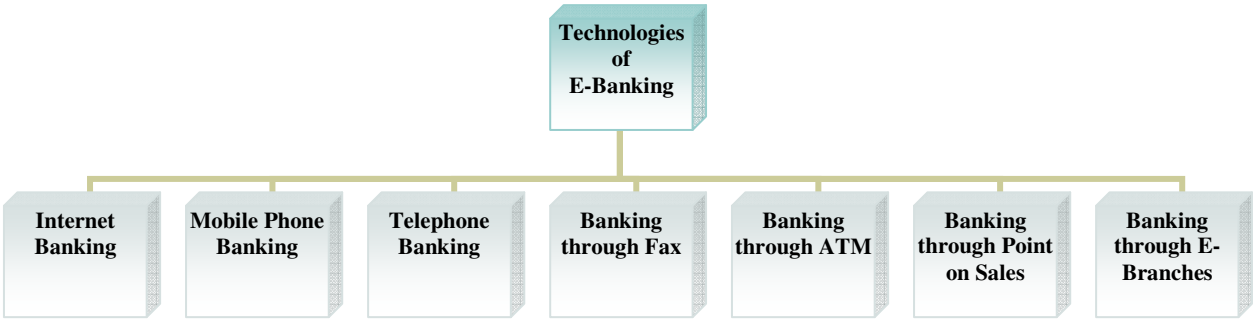
MODES OF E-BANKING

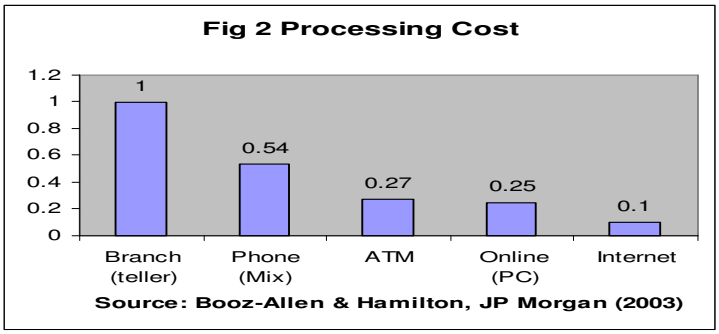
Technology has enabled banks to overcome the barrier of time and space in extending their services to customers and Quality of service is seen more than ever as a key differentiator in the marketplace. One question relates to whether automated, telephone and Internet banking represent positive change are delivering enhanced service quality. There is danger that some customers will go elsewhere if they lose human interaction from their current service provider (Gerson, 1998).

Only improved service provision, with the right mix of human input and technology, will retain customers in the longer term. We shown technologies of E-Banking as figure No 1 below, and then will explain some of them in detail.

Internet Banking: The introduction of Internet has brought the concept of 'Anytime Anywhere Banking'. Internet banking or online banking refers to the conduct of financial transactions by the customers with the help of a secured website operated by the bank. Thus, most of the banks nowadays have websites, which not only provide banking-related information but also facilitate online transactions, such as bank account inquiry, payment of utility bills, credit card bill payment, status inquiry and online shopping. Internet banking and associated transactions are much cheaper compared to rendering services through physical branches (i.e., brick and mortar form). Figure 2 shows the cost of processing transaction through Internet in comparison to other means.

FIGURE 1: MODES OF E-BANKING

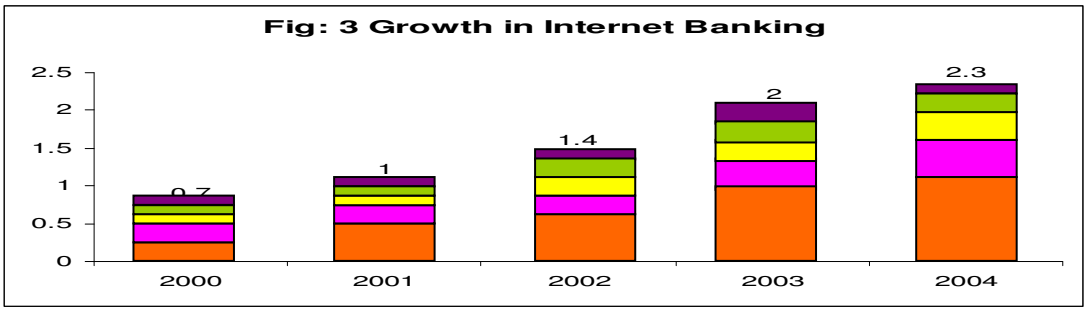




In Internet or online banking, information is transmitted and received in electronic form since Internet is a network of very large number of computers. Based on interviews from four banks in Hong Kong noted that basic transactions and securities trading are the most popular types of operations that customers carry out on Internet banking.

The banks have been riding high on the technological wave of Internet banking and at the same time discouraging physical banking transactions by levying additional charges at physical branches. Thus, due to investment in technology and its adoption by different banks, growth has been witnessed in the field of Internet banking as depicted in Figure no 3 in different parts of the world.

Digital Products of E-Banking: Indeed, Internet banking has become a business necessity, rather than a means for banks to gain a strategic (Scott, 2002). Internet banking would enhance the quality as a digital product/service and thus the instrument should in principle be applicable to it. With Internet banking, the following typical secure Internet banking services are provided for account holders, as see in the figure No 4. Items may be added or subtracted from this list. Depending on the bank being used.



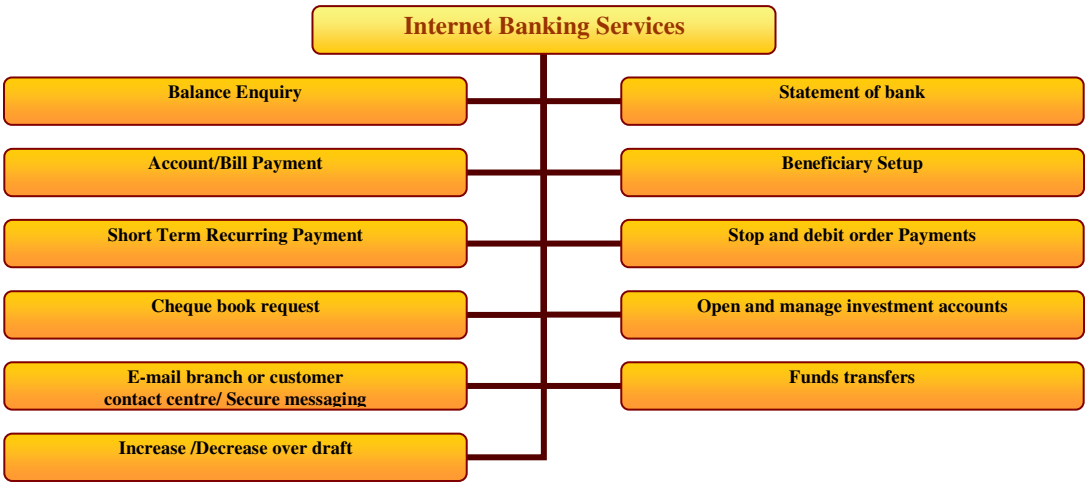
Rest of the World	1.0	1.7	3.1	5.1	6.1
Asia- Pacific (exc Japan)	2.4	4.4	6.8	9.8	13.8
Japan	2.5	6.5	11.9	19.6	21.8
US	9.9	14.7	17.1	20.4	22.8
Western Europe	18.6	28.0	37.8	47.7	57.9

Source: International Data Corporation, www.epaynews.com

Telephone Banking: facilities allow non-cash transactions to be carried out (over the telephone), which would have required a visit to a branch earlier (Prendergast and Marr, 1994), similarly, Internet banking allows customer to perform tasks at a time and in a place convenient to them. Dabholkar (1996) suggests that direct contact with such technology also gives customers a feeling of greater control. Most telephone banking uses an automated phone

answering system with phone keypad response or voice recognition capability. With the obvious exception of cash withdrawals and deposits, it offers virtually all the features of an Automated Teller Machine(ATM): account balance information and list of latest transactions, electronic bill payments, funds transfers between a customer's accounts, etc. Usually, customers can also speak to a live representative located in a call centre or a branch, although this feature is not guaranteed to be offered 24/7. In addition to the self-service transactions listed earlier, telephone banking

FIG:4 INTERNET BANKING SERVICES



representatives are usually trained to do what was traditionally available only at the branch: loan applications, investment purchases and redemptions, cheque book orders, debit card replacements, change of address, etc.

Mobile Banking: In the simplest form, mobile banking services enable users to receive information on their account balances via SMS. Some new soft ware enabled mobile phone to use some banking services such as fund transfers between accounts, stock trading, and confirmation of direct payments via the phone's micro browser. Several European banks have

introduced successful mobile financial services for these smart phones, where as some U.S. banks have recently closed their mobile banks due to lack of users, All amount of transfer funds through mobile phone by emigrant foreign workers was 268 billion $ in 2006 .

So, customer can track their account and credit card transactions and transfer funds between accounts. Further more, they can pay bills and trade equities using a menu-based inter face. Banks are one the key players that want to preserve their position as a central payment and banking services provider in the financial market.

ATM: Automated Teller Machine is a computerized telecommunications device that provides the customers of a financial institution with access to financial transactions in a public space without the need for a human clerk or bank teller. On most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smartcard with a chip, that contains a unique card number and some security information, such as an expiration date or CVC (CVV). Security is provided by the customer entering a personal identification number (PIN).Using an ATM, customers can access their bank accounts in order to make cash withdrawals (or credit card cash advances) and check their account balances.

CRM IN E-BANKING

Discussion has recently arisen on the strategic benefits of adopting the relationship approach in the banking sector (Bennett and Durkin, 2002). It is essential for the banks to know its customers well, building a strong, trusting relationship with them – which is particularly important in the financial services sector due to the complexity of many of its products (Diacon and Ennew, 1996; Bejou *et al*, 1998), commitment, honesty, cooperation between the institution and its customers (Tyler and Stanley, 1999; Rexha *et al*, 2003), as well as customer satisfaction.

The use of CRM in banking has gained importance with the aggressive strategies for customer acquisition and retention being employed by the banks in today's competitive milieu. It is also a business strategy that aims to understand, anticipate and manage the needs of an organization's current and potential customers. It is a strategic, process, organizational and technical change, whereby a company seeks to better mange its own enterprise around customer behaviors. Simply put, it involves six major drivers:

Targeting customers

Consistent interface with customers

Prospecting by identifying the 'best' prospective customers

Acquisition by attracting them to become customers

Cross-Sell/Up-Sell and build Loyalty by doing more and the right kind of business with them.

Retention by keeping them as long as possible, that is, wins back and save your customers.

CUSTOMER PERCEPTION & SATISFACTION

In the literature on service marketing, perception is defined as the consumer's belief concerning the service received or experienced. Customer perception has been regarded as an indicator of the marketing effectiveness of the firm, many companies now identification of customer's expectation and actual delivery of services are essential elements of marketing strategy. So companies must create positive attitude towards the identification of needs and wants of the target customers, it is a fact that achieving and maintaining of positive customer perception even at higher cost would not be costlier than cost of negative customer perception. But Satisfaction is" a customer's emotional response to his or her evaluation of the perceived

discrepancy between his or her prior experience with and expectations of product and organization and the actual experienced performance as perceived after interacting with organization and consuming the product ".(Vara, 2002.p.5).(Satisfaction= Perception _ Expectation). Customer satisfaction is an important factor to the success of businesses. In the mass consumption era, one of the aspects that will make a customer choose certain products or companies over others will be the level of customer satisfaction and support before and after the sales services provided. In the financial service industry this is a major oversight since the banking industry relies on customer satisfaction for most of their business transactions, and provides a service and not a tangible product. The only thing customers have to gauge their expectations about these service offerings is customer care (Allen, 2000).

A review of articles on the financial services industry revealed that corporations know what the consumers are looking for and that value is measured through quality (Kerber, 2000). The threat of increased competition, slower growth rates, and price pressures induced many organizations to focus on customer satisfaction (Keber, 2000). Parasuraman, Zeithaml, and Berry (1985) have concluded that service quality can be described based on ten dimensions. Attempts to measure these ten dimensions, however, reveal that customers can only distinguish among five of the 10 dimensions. The five dimensions of service quality that customers distinguish among are:

Tangibles: Appearance of physical facilities, equipment, personnel, and communications materials.

Reliability: Ability to perform the promised service dependably and accurately.

Responsiveness: Willingness to help customers and provide prompt service.

Assurance

Empathy: Making the effort to know customers and their needs.

Therefore, a company's ultimate aim in today's highly competitive environment is to reduce the number of complaints to zero .The banking industry is no exception. A lot of empirical studies were conducted over the past few years on the basis of measurement of service quality of banks. The SERVQUAL model developed by parasuraman, et al. (1985) is widely used to measure the quality of service by different service-providers like bank, hospital, travel agency and so on. The model provides for five dimensions as cited above. Gani and Bhat (2003) conducted a comparative study on service quality in five commercial banks of India, covering public, private and foreign sectors using SERVQUAL model and concluded that service quality of foreign banks was comparatively much better than that of Indian banks and suggested heavy investment by Indian banks in tangibility dimension to improve the quality of service to the customers.

BANKING SECTOR OF IRAN IN A GLANCE (CUSTOMER-ORIENTATION)

The basic purpose of the Iranian banking system is to serve around 70 million people, making profit is secondary goal. All banks in Iran are under the control of central bank of Iran Islamic. Iran Islamic bank is responsible for regulating and implementing of the country credit &monetary policies.

Some information about Iranian banks related to this textual are as following in Table No 1.

Table 1: Part of E-Banking Equipments in Iran till end of 2007

Banking Card	POS	ATM	Branches	Banks			
				Electronic	Private	Specialized	Government
				2	6	4	7
25,871,666	1,40,000	9000	16,9810	2	17		

We can divide all the banks customers in two categories.

1- Non- profitable Customers

2- Profit Customers

1- Non-Profit Customers: Non profit customers can be further subdivided in two groups as shown below:

A: *All the government's and company's employees, those who get salary through banking system.*

B: All amount of owners in Iran including (landed property, vehicle,) those, who pay bills like (electricity, water,) through banking system (around 112.000.000 bills monthly).this category includes majority of customers. Banks can't give good services to them, because they are non-profit customer and engage employees in their work. For this reason such category causes decline in the service qualities of the banks.

2-Profit customer:

Profitable customers are those who pay bank for their services or from whom bank make profits from. These are those customers on whom banks tries to focus on, because they are the real customers. Banks make money from them by providing services like bank deposit, fix deposit, providing loans, credit services, transfer of funds, etc. people in this category are much less as compare to the first category.

Iranian economy is a highly liquid, large amount of money flow in and out of the country and within the country which is mostly done through banks. People prefer to deposit their money in banks despite of low return (as interest) because of the low risk involved and liquidity of their fund. And the other hand, according the above information in table No 1, we understood that

banking facilities and devices are very less for this section of customers. And banks are going to increase all of them b 2010.

E-CRM SOLUTION FOR BANKING SECTOR IN IRAN AND ITS PRINCIPLE

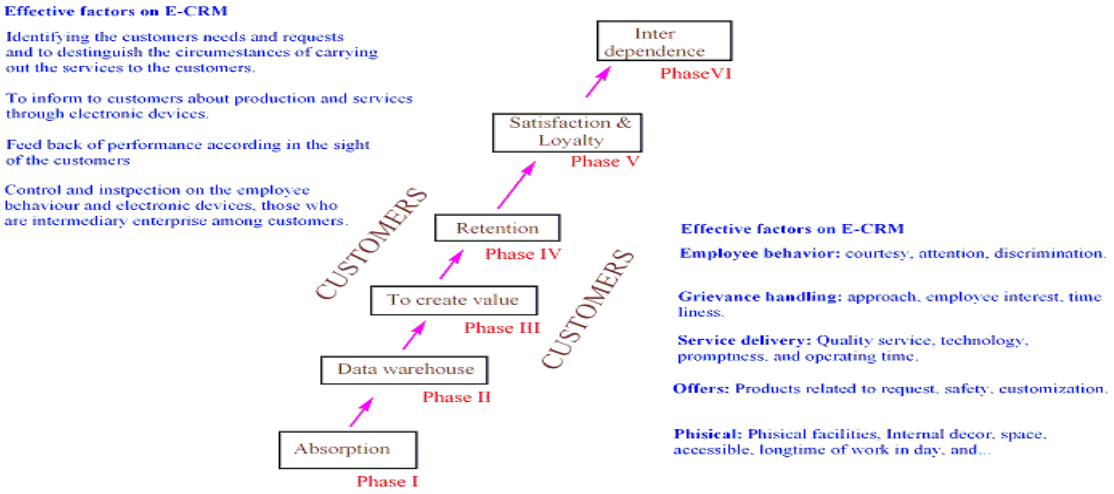
E-CRM solutions are especially valuable to banks that face the following situation:

1. Bank is driven by mission-critical customer service requirements.
2. Current costs for E-CRM run high.
3. Large volumes of information are distributed.
4. A complete customer care solution is needed.
5. Customer data warehouse is very important (safety, access able, processing,)

E-CRM solutions can be deployed and managed to provide increased revenues and decreased costs for banks while improving customer service. E-CRM goals can be achieved through E-Banking devices, like: Internet banking, banking based on mobile phone, banking based on telephone and so on. The competition has been increasing with entrance of private banks in Iran banking sector. In particular, all of the government's banks which, are under the control of government's rule. they have to follow and on the other hand they have to have profits to survive. Therefore profitable customer (second category) is the only hope for government's banks.

From this view, to setting of a comprehensive E-CRM strategy and a strong implementing of , it can increase number of customers, make bank's trust worthy and customer's loyal. E-CRM solution can be visualized in six stages by ten main principles, as given in Figure no 5.

Fig 5: Set up the Strategy related to customers



As observed:

At the first stage of model, is to absorb the customers. This stage is related to set of strategic planning according to the customers, and also to case of physical items like physical facilities, internal decor and so on.

At the second stage, to establish data warehouse , this stage is related to identify customer's request and needs, and also to serve them we need some personal and financial information about customers to offer products, safety and customized services.

At the third stage is creating value for customers. This stage is very important from the customer's point of view. Banks try to create value to their customers, but the customers should know about these facilities , services, through existence E-banking system. and also to service delivery with quality, promptness and operating time through this modern technology and electronic devices with their expenditure (cost). and then the customers , benchmarking (to assay) before each enterprise.

At The fourth stage customer retention: to take feed back of performance according to the customer's view point about their service's quality, grievance handling approach, employee interest, all of this items cause to create customer retention.

At The fifth stage is satisfaction and loyalty of customers. The key role in this stage are E-banking system equipments and employee behavior, courtesy, attention and discrimination and then enterprise should do two important work:

1- control of employee behavior.

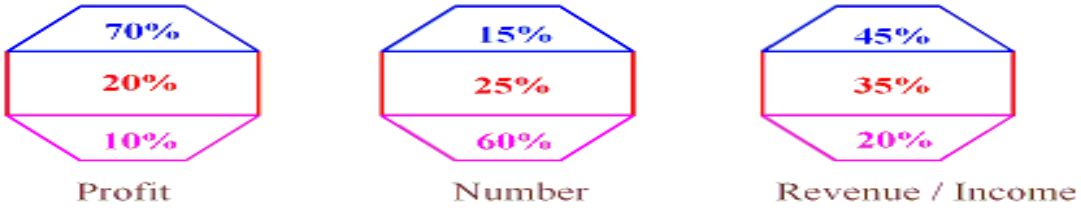
2- 2: control of E-devices.

And last stage is the interdependence, From the beginning of bank's activities, it has feeling of dependence on customer till this stage but at this stage customers have feeling dependence on bank because they trust on bank now, also satisfied and have became a loyal customer, so they can really upon the E-banking system for all of their financial transaction. this is the reason why this stage is called stage of 'Interdependence stage'.

CONCLUSION

With adding private banking and probably to admit Iran as a member of World Trade Organization (WTO) and with the confirmation to establish a foreign banks in Iran (First branch of foreign bank opened on 27-may-2008), all banks are suppose to set up big plans and strategies for their survival and customer retention. To remedy, they can employ, technologies, techniques and strategies which focus on customer-orientation. According to the managers of famous banks, 35% of profit belongs to 5% of customers. It means all of customers don't create similar profit for the banks. According to other research as shown in below figure No 6.

Fig 6: The Customer's Profitable and Classification



As observed, an enterprise is confronted with different and vast spectrum of customers. Upper surface of this figure shows, only 15% of customers have role in 45% of commercial revenue and 70% enterprise's profit belong to this amount. so must to keep more customer-share, set up aggressive strategy. So customer-share must be retained with all of the powers. This is one side and other side is non-profit customers. Large percentage of such customers are those, who have much amount transfer funds with banks, but they are not much beneficial , and minimum of their work is 112.000.000 bills to pay monthly, that huge people come to bank. It means they engage most of banking employee.

Bank should keep high level of service quality for their profit-customer. They can do this, but when people don't come physically to the bank to do some work like to pay bills or transfer funds and so on. To solve this big problem, Banks should increase amount of ATM, POS , bank's cards, E-branches and then they can keep and increase level of service quality. And the important point is CRM that can arrange all of these together, according to the model have shown in the text. It must not forget that, customer is one of the strategic assets of bank and may be for short duration and temporary, but with the implementation of E-CRM properly and perfectly, the customer will become the long time bank strategic assets and permanent customer. At the first, CRM surrounds customers and then try to gain loyalty of the customers by using every opportunity to reach closer till reach the stage of dependence.

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Evaluating the Use of Wikis to Foster Collaborative Group Work

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ABSTRACT

This paper reflects on the experience of introducing Wiki technology into a "Japanese for Beginners" module at one of the newly established universities in the UK and evaluation of learner experiences that followed. The main goal of the project was to facilitate student-centred collaborative learning where learners produced examples of grammar use in small groups of three to five. In contrast to many other projects, the focus of evaluation was not on the degree to which the use of technology was linked to the learning outcomes, but on the process of using the Wiki technology to facilitate group work. The project sought to address two central questions:

- How can Wiki space be designed to support collaborative learning?
- How does student-centred approach to learning space design affect the participants' experiences of learning Japanese grammar?

The sample for the study comprised of 75 undergraduate students who were primarily on their first year of university studies randomly assigned to 13 small groups by the tutor. Subsequently, one public and 13 group pages were set up in the Wiki. The public page contained general instructions on the two grammar tasks, one of which was the same for all the 13 groups and aimed to familiarise students with the Wiki environment and another was specific to a particular group. Initially each group page was private, but they were made public when the participants were ready to share the results of their work with other students.

The research team included one of the tutors teaching on the course, a learning technologist and an educational researcher who exchanged their findings and ideas at all stages of the study. To evaluate learner experiences both qualitative and quantitative data collection methods were employed. Most data was collected through face-to-face and e-mail interviews with students. A semi-structure interview format was deemed appropriate where e-mail and personal conversations were centred on both several key themes suggested by the researchers and the themes that emerged in the participants' responses. Qualitative data was augmented with the quantitative data on using Wiki and other Web 2.0 tools (Ramanau, Sharpe and Benfield, 2008) and the results of end-of-course evaluation conducted by the course tutor.

The paper discusses the findings of data analysis and reflects on the significance of its conclusions for designing collaborative group activities mediated by Wikis and learning research in general.

1. BACKGROUND TO THE STUDY

Although the majority of the higher education institutions in the UK have a Virtual Learning Environment (VLE), which is intended to be used to enhance student learning, the pattern of learning and teaching has not changed dramatically (Browne and Jenkins, 2003 and Bell et al., 2001) and traditional teacher-centred practices are still favoured.

One possible explanation for this trend might be that traditional e-course development approach where tutors or IT staff take the lead may have constrained the potential benefits of using a VLE. Evaluation of student experiences typically plays a minor role in course development in VLE and is mostly conducted in the form of end-of-course surveys. Arguably, without students' direct involvement in the development process, the content or learning activities of the course may not meet students' needs, and fail to have an impact on active participation.

There have been several attempts to explore student involvement in course development using different tools including VLEs and Wikis. For example, the University of New South Wales (UNSW, 2005) issued a guide to help course design, implementation and review. The guide focused on what students need to do in order to learn, rather than on the content that a course should contain or information a teacher needs to convey (UNSW, 2005). Lee and Curry (2005) reported that the staff development team of the University of Hertfordshire provided staff with a learner-centred training approach for the e-course development. Aspden et al., 2005 at Sheffield Hallam University employed students to help with course design and concluded that the students enjoyed the experience and had better understanding of teaching and learning and of

IT. The drawback reported was the student felt it difficult to manage their time on some occasions, e.g. in the examination week.

However, none of these projects considered technical and pedagogical issues in their interrelationship. The present study aimed to analyse the use of Wikis to support student-centred collaborative group work.

Wiki is defined as "a collection of web pages designed to enable anyone who accesses it to contribute or modify content, using a simplified mark-up language" (Wikipedia, 2008). While there are several types of Wikis depending on their usage, ownership and architecture, this technology is believed to have large potential for fostering collaborative group work and creating learning resources. The usefulness of Wikis as a learning and informant resource is difficult to dispute largely due to the popularity of some of the more popular Wiki sites (such as the Wikipedia), but more empirical work needs to be done in terms of analysing ways in which Wikis can support computer-supported collaborative learning.

2. CONTEXT OF THE STUDY

The study was conducted at Oxford Brookes University in the United Kingdom, one of the higher education institutions, which was granted a university in the early 1990s. In the academic year 2006/ 2007, a total of 18,768 students were enrolled on its courses: 73 percent were undergraduate, 25 percent postgraduate and 2 percent were research students. All of the university's undergraduate courses and some taught courses are made up of modules, i.e. classes that are taught and assessed independently of each other (Oxford Brookes University website, 2008). Depending on the course of study some modules are compulsory and some are optional. Full-time students are typically required to take four modules in each of the two semesters.

The module under study is called Japanese for Beginners, which is typically completed by 75 students who choose to specialise in Japanese, or other students who do Japanese as a minor or an elective module. The course content covered all major aspects of the language – reading, speaking, listening and writing. The use of Wikis was seen as an opportunity to encourage students to independently research some of the key grammar functions and to create learning materials that combined descriptions of each functions in groups with other students.

Having the module context in mind, the Wiki space was designed to have two levels (see figure 1): a common public level where general information was provided such as module tasks instruction, Wiki guide, and a common task for all 13 groups which allowed students to familiarise with the system and to develop team work skills. The group members decided when the group resources were made public to other group members.

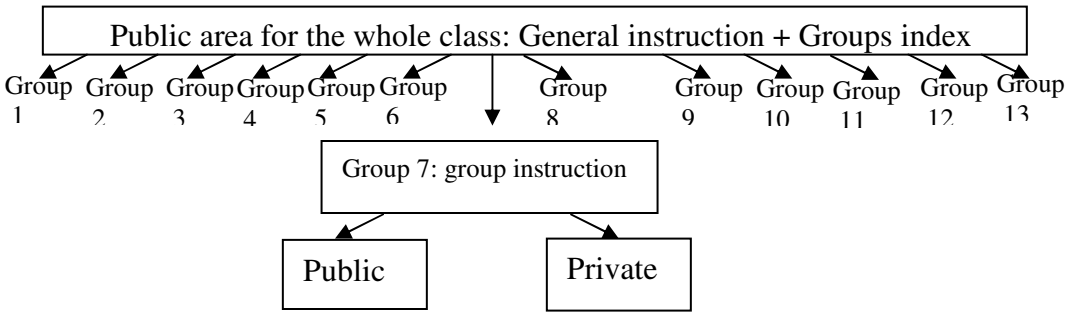

Figure 1: Wiki design: the other groups are represented by Group 7

The present study was part of the Pathfinder e-learning evaluation at Oxford Brookes University and a theme of one of the Brookes Fellowship projects, which aimed to bring learner perspectives into a reflective, multi-skilled team approach to online course development - course design, courser implementation and student-led course evaluation. The research team included a subject expert who was also a course tutor, a learning technologist who led the project and an educational researcher whose focus was on evaluating learner experiences.

3. AIMS OF THE STUDY

The main goal of the project was to facilitate student-centred collaborative learning where learners produced examples of grammar use in small groups of three to five. In contrast to many other projects, the focus of evaluation was not on the degree to which the use of technology was linked to the attainment of learning outcomes, but on the process of using the Wiki technology to facilitate group work. Potentially the results of the project can be used to inform the design of a virtual learning space for collaborative learning. The project sought to address two central questions:

- How can Wiki space be designed to support collaborative learning?
- How does student-centred approach to learning space design affect the participants' experiences of learning Japanese grammar?

4. METHOD AND SAMPLE FOR THE STUDY

To evaluate learner experiences both qualitative and quantitative data collection methods were employed. Most data was collected through face-to-face and e-mail interviews with students at the end of each of the two semesters. A semi-structure interview format was deemed appropriate where e-mail and personal conversations were centred on both several key themes suggested by the researchers and the themes that emerged in the participants' responses. A total of 4 interviews were conducted in person and 7 responses were received by e-mail.

The interview and e-mail data were analysed using the inductive approach to data analysis (Thomas, 2003). In addition, rich contextual information about the module was collected before and during the study through the analysis of course syllabi and other pertinent course resources available online and the interview with the course tutor.

5. KEY FINDINGS

a) Quantitative Data on the Use of Wikis at Oxford Brookes

Before analysing the interview data it is important to consider the differences in the use of Wikis across key demographical groups of students (i.e. gender, age and department affiliation) and the frequency of the use of this technology compared to other Web 2.0 tools, such as blogs, virtual worlds and social bookmarking. The data from Brookes Learning Technologies Survey (Ramanau, Sharpe and Benfield, 2008) conducted in both online and paper formats in October-November 2007 was used. To explore group differences a series of one-way ANOVA tests was performed coupled with the analysis of descriptive statistics. Compared to other Web 2.0 services the usage of Wikis was quite low – students tended to post comments on blogs, contribute to own blogs or use virtual worlds more often than Wikis. 78 percent (n = 926) of a total of 1150 students surveyed in the study never or virtually never use Wikis and 9.7 percent of them (n = 115) did it only occasionally. However, Wiki use appeared to be more frequent than the use of social bookmarking services (M =1.40 on a five-point Likert scale, SD = 0.83 compared to M = 1.32 and SD = 0.80).

The analysis of group differences showed that there were gender, age and school differences in the use of Wikis. Male students were more likely to use this technology than female students ($F_{(1, 1113)} = 6.50$; $p = 0.01$); students aged 20 to 25 years were more likely to use Wikis than students aged 17 to 19 years of age or students aged 25 years of age of older ($F_{(1, 1113)} = 8.05$; $p < 0.001$). Students in the School of Technology and the School of Arts and Publishing students reported more frequent use of Wikis than students in the School of Health and Social Care to use Wikis ($F_{(1, 1113)} = 2.80$; $p = 0.01$).

b) Key themes that emerged through the analysis of qualitative data

The data was coded by two researchers and the key emerging themes were: initial technical difficulties issues of timing one's work; benefits of working with Wikis difficulties with the Wiki structure and suggested ways to improve the environment.

- Initial technical difficulties:

All of the respondents reported initial technical difficulties. They did not know where to start and how to create page content. Some students indicated that they were not familiar with the Wiki environment.

"We were working on the same page. I had lots of work saved; another student saved only a few sentences produced by him after me. So all my examples got lost." –Student A

The interviewees thought that a discussion tool in the Wiki would be desirable as it could support communication among group members.

"It definitely needs to have a discussion page. Currently there is no way can tell what we were thinking, how we came to the decisions. Although we have talked to each other in class or using email, there is no documentation /record of it." Student A

Even after the first semester, some students were still not confident of their abilities to use the Wiki.

- Issues of timing one's work:

Most students complained that there was not enough time to do the group work in class. One of the small groups even made a formal request for additional time on the Wiki task. Although Wikis activities were intended to complete out of class, students thought that it was difficult to find the time to do it and preferred to do the group work in class with other students.

"In our case the main problem was the lack of classroom time meant that we had to shoehorn collaboration into a fifteen-minute or so slot in the Tuesday computer-room sessions which isn't always enough time to sort out problems in a fair and orderly fashion. However, the lack of classroom time is something we've worked on separately - we've signed a petition asking for more classroom hours." Student B

- Benefits of using the wiki

In spite of problems and issues with the Wiki system, the respondents also stressed the benefits of working a group in the Wiki. For example, students claimed that although the first task was to go over what they learnt in class, it helped revision and widening the understanding of the grammar points. In addition, most of them thought that resources created by their peers were easier to understand than textbooks, which helped them to learn Japanese from their peers.

"… because the text book give you one way, like spoon feed, but when someone else thinks about it, writes about, maybe they have new angle on it, slight different, maybe just worded it differently. That may help." Student A

"it is just helpful to go over it. There is one grammar point I did not know. One of my mates explained to me just about something I have not thought of, but then it did make sense when she said it. It is helpful to hear other people like how they understand it, and what it means to them sort of thing." Student B

- Difficulties with the Wiki structure:

Not all of the respondents were sure whether the Japanese grammar Wiki powered by Confluence was the ideal platform. For example, some of them thought that Media Wiki would do a better job, while others argued that having a clearer tree structure would make it easier to understand the nature of group activity.

In addition, the tutor suggested that the page content was organised using three headings: description, examples and application. Students preferred to a set of choice: examples of students' structures from previous year, suggested structure of learning activities or giving them opportunities to design their own structure.

"I feel that things are unorganized. If there were something lick directory tree, you knew where you put up each page. That's would simplify the process as you can see the whole structure." Student D

"The three headings did not work that well. … What I would do is to show what the previous year did, and ask students to come out their own page structure. " Student E

One of the questions asked in the interview was how to design the Wiki space students were the designers. Apart from defining the page structure using three options, which mentioned in the previous section, one student said that introducing competition among groups may encourage interaction between students and deep learning because students taught by different tutors hardly talk to each other except students who were friends.

"…there was not much interaction between the classes. The students in different classes taught by two tutors did not talk to each other apart from people were friends. I'd like some aspects of competition." Student D

This student also viewed that the end of result of the group work was more important than the individual effort towards it as long as everybody played their parts: managing the group, writing stuff in the Wiki, providing comments to what was in the wiki, etc. Another point made by a student was that Wikis provide opportunities for students to teach other students. He said: "*the best way of learning is by doing*".

- Ways to improve the environment

The interview asked students what could be done to improve the Wiki learning experience. For technical support, students made three suggestions. First, Wiki guides or handouts may be helpful. Second, a live demo when introducing the Wiki can be a good start. An interesting third suggestion was that a direct contact person was critical when problems arise. In terms of learning support, one of group leaders said that regularly checking the group progress and providing necessary feedback by a group leader or a tutor can make the group members feel confident to know if they are on the right track.

"Some sort of handouts to provide basic instruction how to do the basic things in the Wiki such as creating pages, editing pages" Student E

"If somebody from the computing services could monitor the situation and could be contacted, it'd help a lot. We did not know who we could go to when there were problems." Student F

6. DISCUSSIONS, IMPLICATIONS AND CONCLUSIONS

From the key findings section, it is clear how important it is to introduce the Wiki properly. Two obvious problems were raised during the face-to-face and email interview were technical issues and lack of motivation from students. After talking to the tutors and computing services, it was found that the Wiki system was introduced several weeks later then it was expected due to technical problems with the Wiki server. As a result, both tutors and students were not given efficient training before using the Wiki system although help page was created in the Wiki. When problems occurred, there was not a direct person to be contacted, which caused the panic, then frustration. The enthusiasm about the new system was affected. Consequently, in the second semester, students treated the Wiki task as something they had to do.

Therefore, when designing a Wiki space for collaborative learning, it is essential to allow efficient time to train students and staff before the system is proper implemented. In term of Wiki design, under the supervision of a tutor, tutor should encourage students do things in their own way. Staff often assumes that nowadays students, as the net generation, are more competent than tutors. In most cases, this may be true; however, universities are to provide equal education opportunity to all students. Therefore, it is important to ensure all students are supported when online activities are part of the course.

Overall, students still felt it was a positive experience to use the Wiki. For example, online group work triggered discussion and peer support online and offline. The students help each other with technical issue and Japanese grammar. Peer learning seemed played a positive role as well. Although students have different opinions on what the best way to learn: from peer, textbook or tutors, the debates and discussions allowed students to reflect on their learning experience and understood the various ways of learning.

This study examined the technical and pedagogical aspects of learning Japanese Grammar by using the Wiki. However, the themes emerged and lessons learnt in the study can be easily applied to other disciplines. As this module was taught in the context of a UK university, students in other setting may have different attitudes towards Wiki as learning environment.

To conclude, in spite that there were some issues when introducing Wiki, that the students managed to complete the tasks set up by the tutors. Peer support and group leadership played a critical role in this learning process. The online group work has by large achieved its intended objectives. In addition, online collaboration also encouraged off line communication and interaction. It is important to note that this study may not be able to present a full picture

how Wiki facilitates group work because of the limited number of students interviewed in the study.

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