

## CORE CAPABILITIES FOR EXPLOITING ELECTRONIC BANKING

Jen-Her Wu

Department of Information Management and Institute of Health Care Management  
National Sun Yat-Sen University, Kaohsiung, Taiwan  
jhwu@mis.nsysu.edu.tw

Tzyh-Li Hsia

Department of Information Management  
Chinese Naval Academy, Kaohsiung, Taiwan  
boundy@cna.edu.tw

Michael S H Heng

Universitas 21 Global, Singapore  
michael.s.h.heng@u21global.edu.sg

### ABSTRACT

New information technologies and emerging business forces have triggered a new wave of financial innovation - electronic banking (e-banking). This study utilizes an innovation model to analyze the impact of e-banking on the incumbent banks. The results indicate that the nature of e-banking innovation is disruptive, leading to drastic changes in both technological knowledge and business model. We further identify eight core capabilities that are necessary for the banks to cope with the change, each appearing to address either technical or business aspects of e-banking transformation. The findings have the potential to contribute to the understanding of impacts occurring in the change associated with e-banking and offer rich insights for the incumbent banks to exploit e-banking opportunities.

Keywords: e-banking, bricks-and-mortar banking, core capabilities, innovation

### 1 Introduction

The banking and financial industry (BFI) is transforming itself in unpredictable ways [Crane and Bodie 1996], powered in an important way by advances in information technology [Holland and Westwood 2001]. Since the 1980s, commercial banking has continuously innovated through technology-enhanced products and services, such as multi-function ATM, tele-banking, electronic transfers, and electronic cash cards. Over the past decade, the Internet has clearly played a critical role in providing online services and giving rise to a completely new channel. In the Internet age, the extension of commercial banking to the cyberspace is an inevitable development [Liao and Cheung 2003]. Both researchers and practitioners in the BFI have highlighted the need for banks to broaden their branch-based delivery channels by embracing electronic banking (e-banking).

E-banking creates unprecedented opportunities for the banks in the ways they organize financial product development, delivery, and marketing via the Internet. While it offers new opportunities to banks, it also poses many challenges such as the innovation of IT applications, the blurring of market boundaries, the breaching of industrial barriers, the entrance of new competitors, and the emergence of new business models [Saatcioglu et al. 2001, Liao and Cheung 2003]. Now, the speed and scale of the challenge are rapidly increasing with the pervasiveness of the Internet and the extension of information economy [Holland and Westwood 2001].

However, to successfully cope with the challenge of the e-banking innovation, the incumbent banks must understand the nature of the change and capability barriers that it presents [Southard and Siau 2004]. Without this understanding, attempts to migrate to e-banking may be doomed to failure. Banks that are equipped with a good grasp of the e-banking phenomenon will be more able to make informed decisions on how to transform them into e-banks and to exploit the e-banking to survive in the new economy [Southard and Siau 2004]. Given the e-banking is a financial innovation [Liao and Cheung 2003], the change may render the organizational capabilities of the traditional banks obsolete. From the resource-based view [Grant 1991, Mahoney and Pandian 1992], in such a context, the banks must constantly reconfigure, renew, or gain organizational capabilities and resources to meet the demands of the dynamic environment. Developing core capabilities can help the banks redeploy their resources and renew their competences to sustain competitive advantages and to achieve congruence with the shifting business environment.

Therefore, the purposes of this paper are to: (1) evaluate the key differences in technological and business features between bricks-and-mortar banking and e-banking; (2) explore the potential impacts occurring in the

change derived from e-banking, (3) identify the core capabilities that are necessary for banks to exploit e-banking. This study utilizes the Abernathy and Clark's [1985] model, with secondary data analysis and comparative analysis to examine the differences in technological and business model, so as to explore the core capabilities in these two dimensions of e-banking innovation. The remainder of this paper is organized as follows. First, we briefly describe the theoretical background including the innovation model and core capabilities theory. Second, we compare the differences between traditional bricks-and-mortar banking and e-banking in the dimensions of technological knowledge and business model and then analyze the impact of e-banking on incumbent banks. Third, we identify the core capabilities that are necessary to exploit e-banking. The final section concludes with a summary and discusses the implications for e-banking innovation and further research.

## 2 Theoretical Antecedents

### 2.1 Categories of Innovation

Broadly speaking, an innovation is the use of new technological and business-related knowledge to offer new products or services that customers want [Afuah 2003]. To comprehend the scope and impact of an innovation, it is necessary to organize them systematically and to understand them fully [Zwass 2003]. Abernathy and Clark's [1985] innovation model classifies innovations based on the impact on the existing technological and business capabilities of the adopting firm. E-banking is essentially a financial innovation that is enabled by creative use of emerging IT and other business forces [Stamoulis et al. 2002]. Accordingly, the innovation encompasses a set of aspects: IT, customer, finance, marketing, and strategy. These aspects can be classified into two major domains: technology and business model that underpin a bank's capabilities [Holland and Westwood 2001, Wu and Hsia 2004]. Thus, we propose a two-dimensional model, adopted from Abernathy and Clark, to analyze the e-banking innovation as shown in Figure 1.

		Technological knowledge	
		Preserved	Destroyed
Business model	Destroyed	Radical innovation	Disruptive innovation
	Preserved	Incremental innovation	Transitional innovation

Figure 1. Changes in technological knowledge and business model

The taxonomic model indicates that the subject of innovation can be described in terms of its technological knowledge and business model. An innovation can be placed anywhere on a continuum from *incremental*, *transitional*, *radical*, to *disruptive* depending on the extent to which the innovation impacts the technological knowledge and business model of an organization. An innovation is incremental if it preserves the existing technological knowledge and business model; transitional if it destroys technological knowledge but preserves the business model, radical if it destroys the business model but preserves the technological knowledge and disruptive if both the technological knowledge and business model become obsolete.

Technological knowledge here refers to the technical capabilities to mobilize and deploy the new information and communication technologies that help maintain an e-banking environment within and across the organizations. Sannes [2001] proposed three technical functions of e-banking - transaction, customer service, and self-help. Sourthard and Siau [2004] looked at five functions: informational, administrative, transactional, portal, and others. In sum, the essential dimensions of technological knowledge can be classified into three areas: IT-infrastructure, transaction, and service.

- **IT-infrastructure** - consisting of a network architecture and application platform.
- **Transaction** - consisting of a transaction mechanisms and security schema.
- **Service** - consisting of customer services and service delivery.

Business model is often used to describe the key components of a given business. Chesbrough and Rosenbloom [2002] defined business model as a coherent framework that converts the new technologies through markets into

business value and identified the six components of a business model: value proposition, market segment, cost structure, profit potential, value network, and competitive advantage. Afuah and Tucci [2003] proposed a set of components of Internet business model, including profit site, customer value, scope, pricing, revenue sources, implementation, capabilities, and sustainability. Based on the literature, the functions of a business model are to: articulate the value proposition (customer value); distinguish a market scope; estimate the cost structure; assess the profit potential; identify the structure of the value network within the bank needed to collaborate with their customers and other stakeholders. We therefore define the dimensions of the business model, including value proposition, market scope, cost structure, profit potential, and value network.

## 2.2 Core Capabilities Perspective

Based on the resource-based view [Grant 1991], a firm's competitive advantage depends on its superior deployment of capabilities [Christensen and Overdorf 2000]. There are growing evidences that core capabilities are often critical drivers of firm performance [Teece et al. 1997]. The core capabilities refer to the firm-specific ability to combine efficiently a number of resources, identify market opportunities, determine strategic situation, and create competitive advantage. In this respect, the development of core capabilities reflects a firm's ability to cope with the change in a timely way.

Following the core capabilities perspective, several scholars explored the core capabilities for an electronic business (e-business). For instance, Rindova and Kotha [2001] employed the perspective to examine how the organizational form, function, and competitive advantage of E-business co-evolve. Heijden [2001] identified three information technology (IT) capabilities such as IT governance, business system thinking, and relationship building in an electronic commerce (e-commerce) context. Daniel and Wilson [2003] identified eight core capabilities that are necessary for E-business transformation and identified practices in developing these capabilities that are both effective and common across firms. Wheeler [2002] proposed the Net-Enabled Business Innovation Cycle (NEBIC) model for measuring, predicting, and understanding a net-enabled business's ability to create customer value through the use of innovative IT. This approach incorporated both a process view of net-enabled business innovation and defined four essential capabilities: choosing new IT, matching economic opportunities with technology, executing business innovation for growth, and accessing customer value for net-enabled business innovation that creates customer value. The strengths or weaknesses of these capabilities can be used to predict the net-enabled business's ability to create value in the face of technological change.

## 3 Differences between Bricks-and-Mortar Banking and E-Banking

Understanding the nature of innovation is a crucial first step in managing the changes associated with any innovation [Afuah 2003]. In order to explore the nature and impact of e-banking, this section utilizes the aforementioned innovation model to frame a comparative analysis of extant literature and analyze their differences in the dimension of technological knowledge and of business model, and then to examine the possible impact of e-banking on the incumbent banks.

### 3.1 Variations in Technological Knowledge

To investigate the changes from traditional bricks-and-mortar banking to e-banking in terms of technological knowledge, we analyze the key differences in the IT-infrastructure, transaction, and service dimensions, as summarized in Table 1.

The history of automation of banking records the shifts in the IT-infrastructure from mainframe, to PCs, to client/server, before the emergence of the Internet. These IT-architectures are embodied in desktop computing and wired networking architecture, which is supported by proprietary electronic network implemented by banks or private third party. In the past, the networking of branches is largely based on the wide area network (WAN) architecture. Traditional banking systems, conducted with the use of information technologies centering on electronic data interchange (EDI) over proprietary value-added networks (VANs) that are established by vendors to deliver services over and above those of common carriers that are licensed by governments to provide financial services to the public. The EDI provided the computer-to-computer exchange of standardized electronic transaction documents and data. In contrast with the Internet, the VANs provide higher security features and quarantined bandwidth. However, the centralized control architecture limits the interoperability of linking additional networks and integration of heterogeneous applications. Moreover, the vast majority of traditional banking applications are based on mainframes and terminals. They are meant to support transaction functions within banks and do not provide much information because of limited bandwidth, platform dependency, and multiple software licenses [Standing 2002].

Thus far, e-banking is embodied in Internet-based computing and wired or wireless networking, which is supported by the standard protocol - TCP/IP. By relying on the open infrastructure and standardized protocol, the Internet provides an interoperable and worldwide networking model. Contrary to the limited bandwidth of the

private network, the capacity of public Internet is abundant and nearly free. Moreover, the World Wide Web (WWW) can support the transmission of multimedia data. Based on the application platform, the web-based e-banking applications can be characterized as intense hypermedia systems. The e-banking applications are frequently multifunctional systems that must integrate with existing front office, back office, and legacy information systems within the bank and often need to connect with trading partners and external stakeholders. Developing e-banking applications therefore require a combination of web site development techniques such as content and user interface design together with object-oriented IS development techniques [Vidgen 2002].

Table1: Variations in the dimensions of technological knowledge

<b>Factors</b>	<b>Bricks-and-mortar banking</b>	<b>E-banking</b>
<b>IT-infrastructure</b>		
Network architecture	Wired networking Proprietary network: WAN, VAN Data-oriented transmission Quarantined bandwidth Communication: EDI	Wired and wireless networking Public network: Internet Multimedia data transmission Abundant bandwidth Communication: WWW
Application platform	Desktop computing Mainframe-centric platform Platform dependency Transaction process system Inefficient user interfaces	Internet computing Web-based platform Open interoperability Multifunctional hypermedia system Rich user interfaces
<b>Transaction</b>		
Transaction mechanism	Branch-based banking Over-the-counter Physical facilities, processes, payments Location and time critical	On-line banking Anywhere-anytime Virtual facilities, processes, payments Overcome geographic or time limitations
Security schema	Mainly cash or check Bank-self audit and database security systems Paper-based and face-to-face confirmation	Digital medium of exchange Standardized security systems Security protocols: SET, SSL, WTLS, wireless PKI.
<b>Service</b>		
Service delivery	Geographic banking Bricks-and-mortar operations Transactional and administrative services Channel: mainly telephone or branch counters	Virtual banking Online self-services Transactional, administrative, informational, financial portal, and self-help services Internet channel
Customer service	Person-to-person interaction Passive customer services Articulated customer needs Standardization	Online interaction Active customer services Articulated and unarticulated customer needs Customization

An important aspect of banking system is the mechanisms for conducting secure transactions. Until the reorganizations of the mid-1990s, the conventional mechanism for conducting financial transactions in retail banking was via local branches or ATM [Liao and Cheung 2003]. Bricks-and-mortar banking requires a maximum of interaction with physical facilities, processes, and payments. In the context, customers and banks usually need to establish a physical presence in a geographical location in order to carry out transactions there. The mediums of exchange mainly include cash, check, bank cards, etc. Moreover, bricks-and-mortar banking frequently used bank-self audit systems, database access control, over-the-counter contract, and fact-to-face or paper-based confirmation to minimize the risk of fraud, misappropriation, security vulnerability, etc. The typical security schema consists of the combination of user-id, password, stamp and autography.

In contrast, e-banking is a way of on-line transaction via the Internet. It constructs an alternative channel by which customers can easily make a transaction anywhere-anytime and reduce their needs for financial intermediaries. Given the open nature of e-banking, security is likely to emerge as the biggest concern among the

customers [Cheung and Liao 2003]. Thus far, several well-developed digital transaction mechanisms and online payment systems have been developed to support the new channel. For instance, the new generation of payment systems (e.g. electronic funds transfer networks) based on smart card technology (for use in credit cards, smart cards, electronic cash and electronic purses) with embedded digital identifications (IDs) can be introduced to simplify use of cross-border transactions by global standardization [Sannes 2001]. The typical security schema of e-banking includes the encryption, firewall, and a certification of the bank's server to prevent another masquerading. Now, the popular security protocols include Secure Socket Layer (SSL), Secure Electronic Transaction (SET), Wireless Transport Layer (WTL), and wireless Public Key Security (PKS) [Zhu 2002].

Over the past years, banking service delivery has already been migrating customers from branch-based operations to online self-services [Simposon 2002]. The nature of the former mainly focuses on internal services such as transactional and administrative functions that allow bank customers to perform routine financial activities and to conduct standardized business transactions by using branch counters. In contrast, an e-banking channel is an internal resource whose utilization must be maximized, and is an interface to the bank's customer base whose usage should enable customer relationship management [Stamoulis et al. 2002]. Thus, e-banking should be utilized as an integrated delivery channel that not only focuses on transactional and administrative services but also supports more informational, financial portal, and self-help services [Sannes 2001, Southard and Siau 2004]. For instance, banks could provide additional industrial and financial information, market research reports, financial planning software, and other value-added services. In addition, banks can use collaborative filtering to offer recommendations based on past transaction profile or customer interaction and tailor the services to the customers. Therefore, in the e-banking environment, the customer can have full access to relevant financial information, and needs no longer to rely on the service personnel at the branch office. It also allows customers to do more self-service for themselves, providing greater satisfaction.

In essence, traditional banking is a way of person-to-person service delivery over the counter. It views the customer as a passive participant in the transaction process until the time of the transaction. Conversely, e-banking services are promising customized services tailored to customer needs. Such services delivery considers the customer as an active participant at every stage of the transaction process, and as the co-producer of the financial products and service offerings. In contrast to the traditional banking services which focus on articulated needs as stated by customers, or the bank's perceptions of customer demands, customized services focus on both articulated and unarticulated needs by guiding customer's profile and usage patterns. Instead of accepting off-the-self financial products or services, customers can choose their personalized financial services in an e-banking context. However, e-banking offers alternative approaches by which banks can provide individual offerings and services to attract customer interests, increase customer loyalty, and repeat transaction [Wind 2001].

### 3.2 Variations in Business Model

The term *business model* is used to describe the key components of a given banking business. The differences in the five important dimensions of a business model - value proposition, market scope, cost structure, profit potential, and value network - between bricks-and-mortar banking and e-banking are independently analyzed in this section. Table 2 summarizes the key differences in these dimensions.

As mentioned previously, bricks-and-mortar banking needs to establish a physical presence in a geographical location in order to serve local customers there. The physical outlet is a most comfortable way of handling money. It can more effectively serve customers with lower IT awareness and acceptance [Liao and Cheung 2002]. Therefore, traditional banks are better able to build customer trust because of their physical presence in the markets they serve. Consumers perceive less risk because there is an accessible location where they can perform transactions, particularly risky trades or register complaints. The over-the-counter operations also help to overcome concerns about the security of on-line payment. Additionally, banks situated in a community can participate in local social networks that enhance trust and brand impression [Stenifield et al. 2003]. Traditional banking has realized the value arising out of reduced risk, improved trust and brand embeddedness.

Since consumers can e-bank over the Internet at any time in any properly equipped location, e-banking eliminates physical and geographic boundaries and time limitations of bricks-and-mortar banking. It also provides consumers with efficient - time-saving and high speed - financial services online. In addition, customers should be able to access rich financial information and services via the Internet. Such convenience has three potential impacts. First it may result in an information asymmetry where the customers have more information than the bank, and they may choose to bypass the bank for services that are offered by alternative parties. Second, it is possible that an information transparency may result in a new marketplace of financial services in virtual world [Grover et al. 1999]. In fact, e-banking has led to a repackaging of financial functions, perhaps giving rise to a complete new channel [Crane and Bodie 1996]. In addition, e-banking can be utilized as a channel to develop long-term customer

relationships through ready access to a broad and increasing array of products, services and low-cost financial shopping, rapid response to customer inquires, and customized product-service innovation [Liao and Cheung 2003]. Consequently, the alternative channel may extend the bricks-and-mortar banking. In sum, e-banking realizes the following value propositions: efficiency, convenience, customization, and market extension [Simpson 2002, Stamoulis et al. 2002]

Table 2: Variations in the dimensions of business model

<b>Factors</b>	<b>Bricks-and-mortar banking</b>	<b>E-banking</b>
Value proposition	Localization Risk reduction Comfortable services Enhanced trust	Efficiency Convenience Customized services Market extension
Market scope	Physical marketplace General users Specialized geographic customer base Customers are passive participants	Virtual marketplace Users with Internet connection Wide customer base Customers are active participants
Cost structure	High entry and start-up costs High operating costs High networking, transaction, production costs	High technology investments High contents creation and security management costs Low entry, operating, networking, application development costs
Profit potential	Over-the-counter serving revenues Lower risks	Transactional commissions, servicing charge, advertising revenue, and financial information subscriptions Lower transaction, labor, premises, and service costs
Value network	Intermediation model Key stakeholders: mainly for consumers and financial institutions	Re-intermediation model Key stakeholders: Internet service providers, content providers, financial portal, online stores, retail outlets, etc.

The market scope refers to the geographic areas and market segments to which the value should be offered. In terms of geographic areas, the market scope of bricks-and-mortar banking is restricted within physical marketplace. In contrast, the size of the potential customer base is also much smaller. Because e-banking is a new marketplace, the market segments of traditional banking and e-banking are quite different [Channon 1998]. The demographics of traditional banking consumers are as heterogeneous as the general population. They are mainly functionally computer illiterate and technologically unsophisticated users. In contrast, e-banking consumers are mainly seasoned Internet user and IT-literates. In general, Internet users are generally modern young people and well educated. This age segment will attain economic maturity in the near future, to be followed by even more technologically aware and cyberspace-oriented individuals [Liao and Cheung 2002]. To exploit the new customer base and increase the existing market share, the incumbent banks must seek to attract and capture the potential clients as early as possible.

E-banking is driven largely by the prospects of operating costs minimization and operating revenue maximization [Sannes 2001]. Simpson [2002] indicated that e-banking is likely to be implemented where the operating overheads of e-banking delivery of bank services are less than the operating costs of delivery of financial services through branch network. In contrast to traditional banking, e-banking is cheaper and it handles transaction process automatically, without being weighed down by bulky documents. Thus, use of e-banking has the potential for order-of-magnitude reductions to the cost of processing and transmitting information [Emmon and Greenbaum 1998]. In addition, the Internet has low networking fees, application development costs, and free Internet overhead costs. E-banking also provides more self-services. It means that the bank requires few resources, resulting in lower transaction and production costs [Southard and Siau 2004]. Due to the electronic channel, the investments in IT and the costs of security management and financial content creation are higher than that in bricks-and-mortar banking. Nevertheless, as e-banking is a new marketplace, to attract potential customers and actually build a brand requires extra marketing investment. On the other hand, because of the bricks-and-mortar banking is rooted in branch-based networking and paid-for infrastructure provided by third-party vendors, high entry and start-up costs are the most

prominent barriers for entrants. Thus, we conclude that cost structure of both banking models is different.

The profitability of a banking channel has to be calculated on the basis of revenues that are generated not only by directly charging the customers but also by exploring any reductions in operating costs [Stamoulis et al. 2002]. In terms of operational efficiency, it is evident that the expenses of labor, facilities, premises, and back-office paper work are minimized because the customers can use online financial self-services to attend to the financial transactions [Liao and Cheung 2003]. It also means that the e-banking allows banks to link directly to customers online, thereby significantly reducing transaction, labor, promotion, and service costs. In the bricks-and-mortar context, banks receive their revenues sources directly from the over-the-counter products and services they offer. In terms of e-banking, the transactional commissions, servicing charge, advertising revenue, and financial information subscriptions are sources of extra revenue.

Now, mobile e-banking also offers tremendous profit potential by providing mobile financial services to attract the mobile consumers. In fact, it is apparent that many banks are motivated to implement e-banking by forces relating to the maximization of the earning through increased market scope and improved customer relationship due to product delivery convenience and service customization [Wind 2001, Simpson 2002]. In addition, mobile e-banking also offers tremendous profit potential by providing mobile financial services to attract the mobile consumers. In short, e-banking could reap profits from the successful exploitation of the synergies of innovative financial services and appropriate marketing and pricing strategies via virtual channel.

The value network describes the position of a bank within the business linking suppliers and customers, identifying potential complementors and competitors [Afuah and Tucci 2003]. The position of banks is mainly an intermediary in the value network of the BFI. The role of mediator brings debit and credit sides together and makes financial transactions. In the past, the value network mainly involves the consumers and financial institutions relating to the bank's branch network. In contrast, e-banking has blurred the boundaries between banks and other industries [Liao and Cheung 2003]. The expansion of financial market will intensify the scope of competitive environments and the complexity of inter-organizational banking involving various stakeholders such as Internet service providers, content providers, financial portal, online stores, retail outlets, etc. Banks have an opportunity for "reintermediation" in the BFI by developing e-banking [Altinkemper 2001]. The new opportunities brings new challenges - the branch network has been downsized, the traditional value network has been broken up, the competition among banks has intensified, and non-financial companies have introduced financial functions as part of their online offerings [Holland and Westwood 2001]. For example, insurance companies diversify into banking, and retail e-commerce companies provide banking products. Consequently, the arrival of e-banking has accelerated the reconfiguration of the value network in BFI.

### 3.3 Impact of E-Banking

Based on the previous discussion, the impact of e-banking involves two aspects: the change of technological knowledge and reconfiguration of the business model. Firstly, Internet technology has overturned the IT-infrastructure of branch-based networking and triggered changes in the knowledge about networking, data transmission, computing platform, interoperability, and system design. Next, the e-banking has also changed traditional payment mediums, physical transaction processes, service delivery channels, and security schema into a virtual environment. Finally, the informational, customized, and self-service offerings enhance the existing functions of bricks-and-mortar banking. These novel online services are likely to be significant in differentiating e-banking from traditional retail banking. E-banking makes obsolete the technological knowledge of bricks-and-mortar banking. In addition, the new value propositions of e-banking will trigger the fundamental changes in business model dimensions such as customer value, market segment, customer base, cost structure, revenue sources, and the pattern of BFI value network, as shown in Table 2. According to the Abernathy and Clark's [1985] model, we conclude that both technological knowledge and business model dimensions between bricks-and-mortar banking and e-banking are indeed different. We can therefore classify the innovation from bricks-and-mortar banking to e-banking as disruptive innovation. It implies that e-banking will change the trajectory of the IT application for the BFI and evolve a different business model and will strongly influence the existing technological and business capabilities of the incumbent bricks-and-mortar banks along with the progress of e-banking.

## 4 Core Capabilities

A firm's ability to embrace and exploit an innovation is a function of the extent to which the innovation renders the firm's existing capabilities obsolete [Afuah 2003]. The foregoing discussions show that e-banking is a disruptive innovation that will render the incumbent banks' established capabilities obsolete. In other words, e-banking will overturn the existing technical knowledge related to network infrastructure, service offerings, and transaction

security mechanisms and will lead to a radical overhaul of the way of doing business for the traditional banks. In facing the change, the incumbent banks need to undergo business transformation in order to exploit e-banking. To do this, banks have to change their conventional mindsets and reconfigure their capabilities around the needs of e-banking. It requires careful coordination with the development of core capabilities in order to successfully respond to the technological and business changes [Wheeler 2002, Daniel and Wilson 2003].

The results of comparison suggest pronounced differences in technological knowledge and business model between traditional banking and e-banking. The differences raise a number of challenges including issues related to the technical infrastructure, service offerings, and transaction security, which means a radical overhaul of the way of doing business for the banks. Based on the proposed innovation model (see Figure 1) and the core capabilities perspective, a business's ability to exploit the e-banking relate to two generic capabilities: technical and business. These capabilities should be developed and combine, along with the banking routines, for exploiting e-banking (see Figure 2).

By combining the core capabilities perspective and emphasizes the recognized critical differences between bricks-and-mortar banking and e-banking previously, we further identify the eight core capabilities. From the technical perspectives, the core capabilities include *planning new IT-infrastructure*, *enhancing transaction security*, *providing value-added content*, *delivering differentiated services*, while the core capabilities for business area consist of *conveying value propositions*, *managing customer relationships*, *integrating physical and virtual channels*, and *positioning in an attractive site*. We describe them below. These capabilities are derived from the review of extant literatures in IS capabilities [Feeny and Willcock 1998, Bharadwaj 2000, Wheeler 2002] and e-banking [Wind 2001, Liao and Cheung 2002], and discussions with several BFI managers in Taiwan.

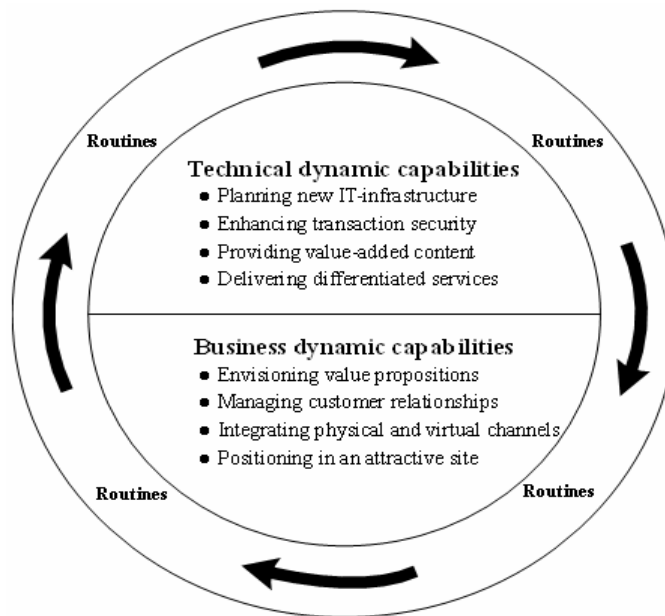


Figure 2. Eight core capabilities for exploiting e-banking

**Planning new IT-infrastructure.** Most innovations in financial services have been enabled by the innovative application of IT [Holland and Westwood 2001]. E-banking initiatives are based on the Internet and require integration with existing systems. For the traditional banks, the need for designing new IT-infrastructure and developing appropriate technical platform may be self-evident. In addition, e-banking adds some subtleties to system integration capabilities, particularly with regard to network and platform integration. Hence, it is imperative to evaluate enabling and emerging IT, to upgrade network architecture, to erect open platforms and to integrate the existing applications with Internet. Banks must also know how to develop new solutions to integrate internal systems with external business stakeholders, allowing them to conveniently carry out secure transaction online. Consequently, the new IT-infrastructure should ensure the interoperability and transparency in addition to covering the requirements for security.

**Enhancing transaction security.** Security is a significant determinant of willingness to use banking services



[Liao and Cheung 2002]. Given the open nature of the Internet, cyber-crime will increase in e-banking environment. Online transaction security and privacy protection are likely to emerge as the greatest concerns among the financial institutions and consumers. Since transaction risk would create a great barrier to e-banking acceptance, its prevention and control are crucial for bank reputation and the promotion of customer trust. Before launching new e-banking products and services, it is therefore crucial for the bank to implement safeguards embedded in the IT-infrastructure to manage client assets and private information, and to advertise as widely as possible the introduction and expert endorsement of transaction security initiatives [Baddeley 2004]. There are imperatives of enforcing appropriate security policy and procedures within the e-banking processes. Here, public policy and governmental regulation of online transactions will strongly influence the development of security policy of e-banking. Thus, understanding the financial regulations of different countries is critical for banks to develop their security policy. However, the success of e-banking is likely to come with the ability to developing sound solutions of privacy and security [Liao and Cheung 2003].

**Providing value-added content.** Adoption of e-banking relies on effective information exchange between banks and their customers. When e-banking replaces a traditional service, the customer will need real-time access to relevant information to reduce the uncertainty of transaction compared to the person-to-person services in a branch office. Banks have to give up its information asymmetry relative to its customers to enable them to perform self-services [Wind 2001]. For example, customers may be supported by informational services to quickly analyze potential investments and financial situations via the Internet. With these features, banks must provide additional value-added content such as price, stock market, financial, and customer-related information that matches the individual information needs. Banks can offer financial portal services to fill a market niche for customers who desire informational contents [Saatcioglu 2001]. The informational offerings have low risk and low complexity requirements. However, a challenge for the banks is to determine what content they need to reveal in order to remain as a preferred partner versus the information they will not share in order to control customer decisions [Gover et al. 1999].

**Delivering differentiated services.** A firm's competitive advantages generally come from providing differentiated products and services [Porter 1985]. Automation of banking services is expected to reduce the need for standard services while there will be continued demand for differentiated services [Sannes 2001]. Therefore, in the transformation to e-banking, another challenge for banks is how to differentiate their banking services from other banks. For example, bundling and cross-selling are possible strategies for differentiation [Altinkemper 2001]. Another strategy is service customization which offers tailor-made individual offerings and services to the clients. The customized service is a combination of the customization of the operations and the customization of the marketing and customer relationship [Wind 2001]. It offers customers more control in the transaction process and targets to solve the particular needs. Banks can use data mining techniques to analyze the customers' patterns of doing business and preferences, so as to influence customer decision-making by framing the choice options and making it easier, more productive, more engaging, and cheaper for customers to deal with them than with competing banks. Here, success in this endeavor would enhance the differentiation of financial services, which would in turn strengthen customer satisfaction and loyalty, increase repeated purchases, and attract new customers [Schaupp and Belanger 2005].

**Conveying value propositions.** The banks should use e-banking to focus on customer needs in order to gain the strongest competitive advantages [Wind 2001]. Thus, it raises a fundamental question whether the e-banking channel offers new value to the banking activities of the customer base it serves. As discussed previously, e-banking has its own inherent benefits, especially efficiency, convenience, service customization, market extension, etc. Banks must have the specific capability to translate the potential benefits into actual value propositions. This capability refers to the degree to which the banks are able to envision customer's expectations, take new value propositions to market, and educate the existing and potential customers [Wheeler 2002]. As far as customer's expectations are concerned, Liao and Cheung [2002] found that individual expectations regarding accuracy, security, transactions speed, user friendliness, user involvement, and continence are the most important quality factors in the perceived usefulness of e-banking. In addition, the customer's acceptance of e-banking greatly depends upon their experience with existing financial services and with enabling technology. Therefore, educating the customers to enhance their understanding of e-banking would increase their willingness to accept it.

**Managing customer relationships.** The customer relationships are the source not of temporary gains but long-term profits [Nelson 1997]. A critical success factor for e-banking is how well it executes customer relationships management between banks and existing/potential customers. Since demographic change is an important issue in evolution of e-banking, to exploit the change and increase market share, banks must seek to attract and capture such potential clients as early as possible by supplying a low switch cost technologically and innovative and sophisticated products and services such as global e-banking and mobile transactions over the

Internet. The capabilities to accurately identify customer segments and estimate their profit potentials and then target segments that produce high profits and low risks are important for banks.

Furthermore, the retention and expansion of relationships with old and lower IT awareness customers are also critical for banks. The optimal marketing strategy for banks is likely to be the cultivation of the demand side along the paths of least resistance. Education and facilitation is a key part of facilitating them to migrate to e-banking. Banks should grasp the full significance of providing detailed information and knowledge to enable the old customers to become sophisticated online clients. However, increased customer sophistication and involvement have a significant effect on the willingness to accept and use new offerings [Liao and Cheung 2002]

**Integrating physical and virtual channels.** As we explore the dynamics of banking, it is important to understand that bricks-and-mortar banking and e-banking will exist side by side. Although banks can use the Internet to efficiently and conveniently offer products and services to their customers, many consumers still see bricks-and-mortar banks as the most secure way of handling money. In fact, several research studies have pointed out that the rise of e-banking does not fully replace geographic banking, but rather creates multi-way delivery channels for interactively communicating with customers [Wind 2001, Simposon 2002, Liao and Cheung 2003]. In fact, there are still some functions of the bank, such as cash withdrawal, safety deposit boxes, and other legal functions, which require a physical facility and personnel. In this multi-channel context, banks must know how to blend the established and e-banking channels, to operate in an integrated financial markets and how to design business processes to harmonize multi-channel operations. It is a possible strategy to merge the bricks-and-mortar and virtual banks to form 'clicks-and-mortar' banks [Stenifield et al. 2003]. It may give rise to a completely new channel and delivery methods for banking services. By going online banks can fully exploit the increased efficiency from e-banking, allowing more branch-and-counter resources to be shifted toward higher value-added activities and services such as marketing, market research, financial management, etc [Liao and Cheung 2003].

**Positioning in an attractive site.** E-banking creates a dynamic financial environment in which the number of non-financial entrants into banking markets is rapidly increasing. New entrants have intensified the complexity of the value network of BFI, and place the incumbent banks in a vulnerable position [Holland and Westwood 2001]. To compete effectively, the banks should reconfigure the collaborative relationships with the new stakeholders and then form a new value network. To this end, the capabilities to appraise the bank's position in an attractive area of the value network must be considered seriously. Initially, banks need to evaluate their strategic position, deciding which direction they want to proceed in. For example, a major opportunity for banks is the possibility that they could play a central role in digitally focusing forces of supply and demand to create a new exchange process of customers [Wind 2001]. Showcasing community activities and attractions, offering multilingual sites when appropriate and displaying links to sites that address local needs can provide public relations and business benefits for banks [Southard and Siau 2004]. Moreover, developing new strategic alliances and collaborations with new stakeholders and critically position the banks at advantageous locations in viable value network must be considered seriously.

## 5 Concluding Remarks

This study initially proposes an innovation model and employed inductive methods: comparative analysis and secondary data analysis to analyze the impact of e-banking on the bricks-and-mortar banks. The results suggest that the e-banking is a disruptive innovation for the incumbent banks. It leads to massive changes in the areas of both technological knowledge and business model. To cope with the change, banks must seriously rethink about how to reinvent the ways they serve their customers.

To assist the banks migrate to e-banking environment, we further identified eight core capabilities for exploiting e-banking. These capabilities fall into two distinct groups that must be balanced. One group relates to the capabilities to utilize the emerging IT, while the second group is associated with the capabilities for the reconfiguration of the existing business model. Banks are able to properly exploit e-banking only if they renew their technical and business capabilities. There are two implications for the incumbent banks. On the one hand, banks need to develop uniquely innovative services and products through the secure technical platform and transactional process. On the other hand, they need to established innovative business model that changes the way banks operate and how they interact with their stakeholders.

This study sees the eight core capabilities as a blueprint for sustaining a bank's ability to exploit e-banking. They are particularly appropriate for the incumbent banks with established resources and will help them to cope with the e-banking change. In practice, they can be utilized as a diagnostic tool for practitioners to assess and analyze what aspects of their existing banking operations are most problematic. Practitioners can compare the current level of each element in their banking systems with the expected levels to understand their relative effectiveness and take the necessary corrective actions to successfully make the e-banking transformation.

Our research is an exploratory one which seeks to extend the theory of core capabilities to the domain of

banking. The theory enhances our understanding of the dynamic of banking evolution and provides insights into the business transformation of banks. Being preliminary in nature, this study can not be exhaustive. However, we hope that this research will serve as a stepping stone for new research in e-banking. Several issues for future research are noted in the body of this research. For instance, this study is essentially a conceptual study. Firstly, we do not evaluate current practices with the concepts that match the proposed model and inferred results. Thus, empirical researches should be conducted to refine and extend the results, so as to seek better means of assisting banks to exploit e-banking. Moreover, the discussions are based in the context of Taiwan. The proposed inferences we drew from the inductive methods assumes that the further evolution of e-banking innovation does not deviate very much from the expected course herein. It is not easy to predict the trajectory of the innovation; hence, the limitations of contextual uncertainties, country characteristics and regulation issues may influence the validity of this study.

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