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# ELECTRONIC COMMERCE WITHIN THE CHINESE BANKING INDUSTRY

Sherah Kurnia

*The University of Melbourne, sherahk@unimelb.edu.au*

Yi-Ruo Liu

*The University of Melbourne*

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# ELECTRONIC COMMERCE WITHIN THE CHINESE BANKING INDUSTRY

Liu, Yi Ruo, Department of Information Systems, the University of Melbourne, 111 Barry Street, Parkville, Victoria, Australia.

Kurnia, Sherah, Department of Information Systems, the University of Melbourne, 111 Barry Street, Parkville, Victoria, Australia. sherahk@unimelb.edu.au

## Abstract

*Electronic Commerce (EC) enables business transactions to be conducted electronically, offering many benefits to organisations. While EC has been widely adopted across industry sectors in developed countries, its adoption in developing countries has not been widespread. At the moment, there are relatively fewer studies of EC adoption in developing countries compared to those in developed countries and hence little is known why and how to accelerate the EC adoption in developing countries. This paper explores the adoption of EC within the banking industry of China, as an example of a developing country. The findings of this study are useful to better understand the drivers of EC adoption, the potential of EC and the issues faced by the Chinese banking industry. Other developing countries may also benefit from the findings of this study by establishing their awareness of the EC potential as well as possible barriers that they need to confront in the adoption of EC.*

*Keywords: Electronic Commerce, technology adoption, developing countries, banking industry.*

# 1 INTRODUCTION

Electronic Commerce (EC) is concerned with conducting business transactions electronically using information and communication technologies. It is not only limited to buying and selling over the Internet, but also the transferring or exchanging of products/services and/or information via computer networks, including the Internet, Extranet and Intranet. Activities such as servicing customer online, collaborating with business partners and exchanging business documents within an organization over the Internet or other private networks are all regarded as a part of EC (Kalakota and Whinston, 1997; Tan and Ouyang, 2006; Turban et al, 2008).

Electronic commerce offers an unprecedented way to do business in both developing and developed countries promising many potential benefits, particularly in productivity gains and transaction cost reductions (Turban et al. 2008). Developed countries have experienced a significant growth in EC use in the last two decades and have enjoyed many benefits of EC (UNCTAD, 2005). Compared with developed countries, the growth of EC in developing countries has just started in recent years (Chowdhury, 2003). It is believed that in the long run, developing countries could benefit more from the EC than developed countries since they could leap frog and skip some of the stages in the development of EC by learning from the experiences of other developed countries (UNCTAD, 2000). However, during the processes of EC development in developing countries, there are many unexpected and complex factors that inhibit the speed and scale of EC adoption and diffusion.

In order to encourage further EC adoption in developing countries, a better understanding of what drives EC adoption, what barriers impede the growth, what issues are encountered in EC adoption by developing countries and what can be done to mitigate the barriers/problems is needed. Developing countries have different national environmental backgrounds such as legislation, technology infrastructure, levels of competition, regional ways of doing business and so on from those of developed countries (Gibbs et al. 2003). Therefore, the success experienced by developed countries in EC adoption may not be readily applicable in the context of developing countries and indeed they may face a unique set of issues in adopting EC. However, at this stage, the number of studies of EC in developing countries is still relatively very limited. More studies are still required to understand the relevance of EC in developing countries, to identify areas in which the developing countries lag behind developed countries that inhibit their EC adoption and diffusion and to identify ways to improve the unfavourable situations (Gibbs et al. 2003).

To address the current gap in the literature, this research project is therefore designed to assess the EC adoption in People's Republic of China, as an example of a developing country. In particular, this study explores how EC is being used and a number of issues experienced in the introduction and use of EC. As the context of the study, a domestic banking organisation in China was chosen for a number of reasons. First, it is owned and controlled by the Chinese government, and recently, China has fully opened its banking industry to the foreign-fund banks, which has changed the nature of competition within the industry. The increasing level of competition is expected to drive the EC adoption. Secondly, the information intensity of the banking organisations is comparatively higher than organisations in other industries, which makes the business case for adopting EC relatively more appealing than in other industries. Therefore, the banking organisations have been the early adopters of EC initiatives such as online banking and Automatic Teller Machines (ATM). Finally, e-banking or online payment system facilitated by the banking industry is an important aspect of various EC applications. By exploring the EC adoption within a banking organisation in China, therefore, a good understanding of EC adoption in China is likely to be obtained.

The findings of the study indicate that EC has potential benefits for the Chinese banking industry. Furthermore, various technology-related issues as well as people-related issues have been identified that present challenges for EC adoption. While those technology-related issues are relatively easier to

address through further support from the government, people-related issues, are more difficult to overcome. However, through the improvement in the technology aspect, the community's perception and understanding of EC, it is likely that these people-related issues/barriers will eventually be overcome. The findings of this study are expected to enable Chinese organisations to have a better understanding of the benefits and issues in EC adoption, which may help identify the best course of action to promote the growth of EC. The findings will also be valuable for other developing countries to increase their awareness and understanding of EC benefits and possible issues that they need to face in the course of EC adoption and will guide future studies of EC adoption in developing countries.

In the next section, an overview of the EC development in China and within the banking industry is presented. Then the research method used in this study is discussed followed by the discussion of the participating organisation, the EC initiatives currently employed, benefits and issues experienced by the case organisation. Finally, some implications of the findings are discussed to conclude the paper.

## **2 ELECTRONIC COMMERCE DEVELOPMENT IN CHINA**

As a large and typical developing country with an ambition to become one of the world's economic superpowers, China understands the importance of EC and information technologies in today's world. Following China's entry into the World Trade Organisation, the trades between China and the rest of the world is expected to grow significantly, which makes EC to be an important trading method. Because of different levels of economic and technical development compared to developed countries, China lags behind in terms of the use of the Internet and EC development. Nevertheless, it is trying to catch up the developed countries as can be seen from various initiatives steps taken by the Chinese government. The Chinese government has implemented some measures to regulate the Internet including domain name registration, encryption, the Internet policies and web media monitoring (Kennedy, 2000; Lo and Everett, 2001). In addition, the Chinese government has demonstrated a significant commitment to EC growth through the implementation of a series of "golden projects", started in 1993. Those golden projects aimed at building the technical infrastructure and regulatory frameworks for EC in China. Since then, there has been a gradual establishment and improvement in the logistics, payment and credit system, as well as the Internet and Communication Technology infrastructure (Trappey and Trappey, 2001; Martinsons, 2001).

At present, the U.S. is still the largest global EC market, taking half of the global EC market. Some analysts predicted that China could potentially take the place of the U.S. and become the largest Internet and telecommunication market in the world due to its dramatic increasing number of users and the amazing economic growth (Du, 2006). By June 2006, the number of Internet users in China had reached 123 million. With this rapid growth of the domestic Internet users, a large number of giant organisations, like SINOPEC and Petrol China have adopted EC initiatives. Also, a third party network service platforms such as Alibaba.com, Ebay.com.cn, Taobao.com emerge, there are a massive number of small and medium enterprises, and individual EC stores which have been developed. The developing trend is expanding from large cities such as Beijing, Shanghai and Guangzhou to coastal and inland big cities (CNNIC, 2006). As a result, the Chinese EC market has been expanding rapidly, and is predicted to reach \$654.3 billion by 2010 (CCID, 2006).

Within the Chinese banking industry, there have been some major changes happening in the last two decades that have affected the industry dynamics. Influenced by the economy reform, the centralized banking monopoly has been replaced by a relatively open and free competitive market in China. The four state-owned banks (Bank of China, Industrial and Commercial Bank of China, Agricultural Bank of China, and China Construction Bank) are transforming into commercial banks with full responsibility for their own profit and loss (Wang et. al., 2003). Meanwhile, since China has been joining the World Trade Organisation in 2001, there has been a number of foreign banks growing up and expanding their business scope in China. From December 2006, the Chinese government removed regional and other restrictions on foreign banks, and treat them the same as other local Chinese banks. The domestic banks are then facing intensive competitions from the foreign banks. One important

aspect of the competition stems from various EC products and services offered by the foreign banks. As a result, these foreign banks have taken a large number of Chinese organisations clients over from the domestic banks since their EC products and services are considered to be more reliable than those offered by the domestic banks, employing basic and limited infrastructure, technology, service, management, and technical support (Chang, 2002; Zhang, 2002).

While Chinese banks are facing challenges and threats from the foreign banks, there are also great development opportunities for them. China's domestic banking industry is now in the midst of modernization and revolution, which has been driven by the increasing customer expectations, rapid technology development, and intense industry competition. Thus, China's domestic banks are currently being proactive in devising and implementing strategy to advance their EC products and services. This will potentially improve their competitive position in the market (Chang 2002; Zhang 2002).

### 3 RESEARCH METHOD

In this study, a single case study approach was employed to explore and gain initial understanding of the EC adoption within the banking industry in China. This approach allows for exploring a contemporary issue in a great detail and requires no control over the phenomena under investigation. In addition, this study is considered a revelatory case as no study has been done in relation to assessing the EC adoption within the banking industry in China (Shanks, 1993; Yin, 1994). The case organisation is one of the big four banks in China and, therefore, its experience with EC adoption is likely to represent the actual EC adoption situation among the domestic banks in China.

Data were collected using semi-structured interviews and document analysis. In selecting participants, managers who are believed to be knowledgeable about the EC adoption within the case organization and therefore can offer the organisation's view were selected. Three managers were involved in the case study. Table 1 summarises the participants and their roles within the organisation.

Participant	Brief Description / Role
Senior Manager	The senior manager interviewed in this study is responsible for developing and managing organisation clients
Director of EC Department	With the increasing adoption and diffusion of CFI, the EC department was established. The director of EC department is responsible for making and executing CFI's EC strategy.
Branch Manager	The branch director is responsible for the management and performance of the branch

*Table 1: Overview of Case Study Participants*

The unit of analysis is the organisation under study. Interviews were recorded with a tape recorder and were then transcribed for analysis. To corroborate the data collected during the interviews and to enhance the findings, relevant organisational documentation was also requested and analysed. Correspondence via email was maintained with participants and each of them reviewed the findings. Transcribed interview data and organisational documentation were analysed using the data qualitative analysis technique as outlined by Miles and Huberman (1984). From the interview data, various themes of interests were identified and classified into benefits and issues experienced by the case organisation in offering various EC initiatives.

## 4 THE CASE STUDY

### 4.1 The Participating Organization

China Financial Institution (CFI) (a pseudonym), one of the 'Big Four' state-owned banks in China was chosen in this study. It is a leading bank in China possessing extensive strength in corporate and consumer banking, and treasury operations. It was incorporated in China in 1954 with a head office in Beijing. As one of the leading banks in the domestic banking sector, the CFI Corporation retains leadership roles in key market segments in the areas of corporate banking, personal banking and treasury operations. It continues to pursue innovative banking services such as online banking to stay in a competitive edge and it has an extensive network in China, with approximately 14,250 branch outlets and 1,220 self-service banking centres, and 16,563 ATMs. CFI has also expanded its overseas branches in Hong Kong, Singapore, Frankfurt (Germany), Johannesburg (South Africa), Tokyo (Japan) and Seoul (Korea), and set up representative offices in London and New York. CFI currently has over 300,000 employees to serve 150 million active personal deposit accounts and 1.5 million high net-worth personal customers.

In recent years, CFI has put a lot of efforts in developing its EC and other Information Technology capabilities. CFI Corporation launched internet banking service in mainland China in August 2003, which provides its customers a new media to perform banking transactions via the Internet. CFI has recently described its e-banking service as a core strength and fundamental to its business. To achieve its goal of becoming a leader in e-banking, CFI has strengthened its online management team, encouraged employee training, improved marketing strategies and enhanced customer outreach programs.

### 4.2 Current Electronic Commerce Initiatives

The interviews indicate that recognising the fact that the large number of population in China brings a heavy service pressure to china's banking industry, which may result in several hours of waiting in a queue for customers to do simple transactions, there has been a strong push from the Chinese Government to promote EC development in China, as the economy is developing rapidly in China. In addition, the competition created by the foreign banks with relatively higher EC capability, has driven domestic banks to actively pursue EC. Therefore, CFI has initiated a number of electronic commerce initiatives in the last few years, as discussed below. These EC initiatives have been developed following the guidelines proposed by government and CFI EC department, which are, in turn, developed based on the experience of successful foreign banks.

#### 4.2.1 *Online Banking*

The online banking services were launched in August 2003. The personal online banking system now offers services for account access, transfer, payment, personal foreign exchange trading, online remittance express, bonds, and funds. The client can apply any time and gain instant access to these services. The corporate online banking provides services such as account information inquiry, fund transfer, and authorization management of the accountants.

#### 4.2.2 *VIP Service System*

The VIP services system is based on the CFI's backbone network. It links the customer service centres of the headquarters and branches, draws upon the customer service information system, and provides customized professional financial services for VIPs. It enable customers to manage funds, access

account information, monitor fund use within the same city and different locations on a real-time basis, enhance internal management, improve the efficiency of fund use, and lower the cost of capital.

#### *4.2.3 Mobile Phone Banking*

CFI's mobile phone banking services were launched on July 19, 2004 that draws upon the networks of mobile communications carriers involving the use the client's mobile phone as the terminal. The mobile banking application enables CFI's customers to make personal account queries, transfer funds between accounts, remit payments and handle foreign currency transactions via their mobile phones.

#### *4.2.4 Other online services*

CFI provides internet payment services to support EC activities such as online shopping, hotel and travel reservations and tickets bookings and so on. Furthermore, CFI provides online shopping in conjunction with partner merchants such as Alipay and taobao.com with strict security and privacy control. In August 2007, CFI and Industry and Commerce Bank of China declared to cooperate with alibaba.com, the largest EC service provider in China, to carry out online financing service in three business fields-B2B (business to business), B2C (business to consumer) and C2C (consumer to consumer) that enable the credit rating of online EC become an important reference for loan disbursement.

#### *4.2.5 EC security practice*

To meet the customer's security demand, CFI has launched a wide range of security protection methods which include double password protection, password soft keyboard input, 128 digits key of Internet Explorer browser, Secure Socket Layer (SSL) transmission encryption and digital certificate. The newly introduced printed One Time Password (OTP) card is another security method for CFI's e-banking services including online banking, mobile banking, and online shopping. The portable printed OTP has the size and appearance as a bank card with 45 unique, covered codes on each card. The customers just need to scrape a new code on the card each time they log in.

### **4.3 Benefits Experienced**

From the above electronic commerce initiatives, CFI has experienced a number of benefits, which are mainly operational benefits. These benefits are summarized below.

#### *4.3.1 Improved Service Quality and Satisfy Consumers' Needs*

The findings from this research study show that the EC adoption of CFI firstly has improved the service quality that decreases the counters' pressure and customers' waiting time. Many clients can perform financial transactions at home or at work via the online banking services. Some clients have actually demanded online transactions, as they have the knowledge and ability to use online operations. Thus, besides improving the service quality, CFI has also satisfied its customer's needs through its online banking services.

#### *4.3.2 Improving Business Efficiency and Reducing Costs*

The findings further demonstrate that due to the implementation of the online banking system, CFI has gained a control over the number of its employees, especially the number of tellers in each branch as revealed in the following interview excerpt:

*“The adoption of the e-banking has helped us decreased the counter’s pressure in a great extent. At the same time, if we don’t have e-banking, we would employ more staff to serve the constantly increasing number of customers due to the heat of the stock and fund market. So currently, the adoption of e-banking prevents us from employing more employees. We also are expecting to cut the number of employees to improve organisation efficiency if the diffusion of our e-banking is continually increasing”.* (Director of Department of EC)

#### 4.4 Problems and issues encountered

The development and introduction of the above EC initiatives are not hassle free as there have been a number of issues encountered in this study with CFI. Most of the issues identified are related to the national conditions including the characteristics of the Chinese community that affects the market condition of the case organisation. These issues are discussed below.

##### 4.4.1 *Limitation of National EC Infrastructure*

The case study suggests that the national telecommunication infrastructure influences the diffusion of EC within CFI, as the poor quality of telecommunication network service is an obstacle for CFI’s clients to use their mobile services as a terminal for the e-banking, resulting in a low level diffusion of the mobile banking services.

Another limitation of the national EC infrastructure in China is that it lacks an online payment system for handling credit card transactions in a safe and efficient manner. As noted in the case study, only a small of number of online purchases involve the use of credit cards. The main payment methods are cash on delivery and account transfer through banks. A better online payment system is highly needed to support the growth of EC.

##### 4.4.2 *Lack of Trust from Customers*

The interviews suggest that there is a low level of trust within the Chinese community. As the economy is reforming and booming, there have been a lot of frauds appear in the Chinese society. The low level of trust among people influences the behaviour and attitude of people towards adopting innovative business processes and technologies like EC, as revealed below:

*“When we are selling EC products with promotions such as a 50 Yuan Telephone card as a bonus, which should benefit our customers. However, our customers sometimes could think that this was a trick we set, so they did not buy our products”.* (Branch Manager)

This lack of trust from the customers poses a challenge for the case organisation to foster the growth of their EC initiatives.

##### 4.4.3 *Lack of Security Measures*

Related to the above issue on, all of interviewees in this study have confirmed that the security issue is a significant inhibitor for CFI’s EC diffusion, as many customers do not trust the security of EC product and services.

*“Theft of information, data breaches and internet-based attacks have seriously affected customers purchasing, payment, and online transaction behaviours. We have lost part of our customers due to their security concerns and trust issues with our online banking systems.”* (Director of Department of EC)

This year, the CFI’s online banking system has suffered large scale breaches more than two times. Such incidents have lowered consumer confidence and, thus, hinder EC growth. The findings from this study also show that unauthorized use of personal information to conduct e-banking activities and



the increasing number of high-profile Internet security breaches are becoming an increasing security issue for all Chinese banks. A number of customers prefer to choose foreign banks due to security concern and trust. However, the foreign banks are also not completely secured, as recent attacks involved large financial institutions such as Bank of America and J.P. Morgan Chase, as well as third party payment agencies. The online security has been raised as a major factor influencing the EC diffusion in China. If the quality online transaction and payment security is still not improving, the trust level among customers will even decrease and, therefore, the EC diffusion will be restricted. Thus, the lack of security measures affects the widespread adoption of EC. This problem needs an urgent attention by the financial institutions since there more breaches and attacks happen within the community, the more difficult it will be in gaining customers' trust and changing their perception regarding the security of the EC initiatives.

#### *4.4.4 Unbalanced Readiness across Branches*

The case study findings also indicate that there has been unbalanced readiness across the branches. As a result, there have been different levels of EC adoption and diffusion. When the level of branch's readiness is high as can be seen in urban branches in Beijing and Shanghai, EC is adopted and diffused more smoothly and successful. This is because of the higher levels of IT infrastructure, employee's IT knowledge, local top management supports in those branches, and the local government support. As their EC adoption is more successful, so the head office tends to put more resources and financial support in those branches with a high level of readiness. This leads to a more unbalanced situation across branches with different levels of readiness. It directly and indirectly influences the potential of branches with low levels of readiness to further adopt and diffuse EC. Thus, this unbalanced readiness across branches affects the overall ability of CFI to offer various EC initiatives to all of their customers regardless of their location. Without consistency in product and service offerings, it would be more difficult to diffuse the various EC initiatives and to gain trust from the customers in general.

#### *4.4.5 Customers' Misperception of Legislations*

The research conducted by Tan and Ouyang (2004) shows that the legislation is an initial barrier that influence EC adoption and diffusion in China. However, the findings from this case study show that although EC legislation is one of the obstacles for the EC development within the banking industry, the issue is actually not only about the legislations itself. The more important issue is actually about the customers' misperception of legislations, as revealed below:

*“One of the main issues we currently have is our customers' perception of the legislations. As we know the legislations are already put in place, so we are constantly convincing them that the online banking is well protected by the legislation. However, their response is very negative. They do not know or have never heard about the legislations that have been in place, or they do not even trust the legislations as they think the legislations are not mature.”* (Branch Manager)

The Chinese government has realized the importance of legislation for encouraging EC's rapid development and, therefore, the EC legislation in China is gradually established. However, because of the poor and limited government propaganda, this improvement has not been realized widely within the Chinese community. This issue is also related to the customers' lack of trust within the Chinese society.

#### 4.4.6 Age and Regional Distance

The findings demonstrate that consistent with other studies in developed countries (Gibbs, Kraemer et al. 2003; Tan and Wu 2004), young generation within the Chinese society is more likely to accept to use online banking than the older generation. Likewise, people who live in the developed cities of China, like Beijing, Shanghai, and Shenzhen are more likely to accept to use online banking and other EC services compared with those people who live in developing cities or rural areas. These facts are revealed below:

*“Due to the high uncertainty toward the e-banking service, most of our older age customers are usually hard to be persuaded to accept online banking. They will also watch the other people’s action. If a lot of people apply for the e-banking, sometimes, some of them will follow. Unlike the older generation, young people always come to our counter themselves to apply for e-banking.”* (Branch Manager)

Therefore, people in rural area are less likely to adopt EC and the probable reason for this is because the traditional ways of thinking and transacting are still dominating. Western culture and modern technologies have less influence in this area. Similarly, the older generations of Chinese tend to not be receptive to new technologies and are comfortable with the status quo that involves with face to face transactions and cash payment. Those people tend not to have the needs for online banking, the knowledge of online banking and its benefits, computer skills to access the service and access to the Internet itself.

## 5 DISCUSSION AND CONCLUSION

This study explores the EC adoption within the Chinese banking industry employing a single case study approach. It has demonstrated that the Chinese government plays a major role in supporting organisations to adopt EC through providing financial support for some state-owned organisations and improving / introducing legislations related to EC. In addition, the improvement in the economic condition, the intense competitions from foreign and domestic organisations and the increasing market requirements for adopting EC and improving the current services have driven organisations within the banking industry in China to adopt various EC initiatives. This study also indicates that EC is clearly relevant for the banking industry in China and it has potential benefits to offer. The case study shows that EC plays an important role for the domestic banks in China to meet the changing needs of their customers, improve their service quality, increase business efficiency, and compete with foreign banks, as experienced by the participating organisation. Therefore, the China’s banking industry has been proactively pursuing and offering various EC products and services to the customers. It is also worth noting that most of the benefits reported by the participants are operational benefits. This is not surprising since EC adoption is still considered in its early stage within the China Banking industry and therefore tactical and strategic benefits of EC have not been realized. With increasing and sustainable use of EC applications, the Chinese Banking industry will eventually gain tactical and strategic benefits of EC.

While the case study participants were excited about the benefits experienced from the EC initiatives, there are many issues faced in the EC adoption and use that have been identified in this study. Most of these issues are related to the lack of readiness of China for wider use of EC. The technology related issues including inadequate IT/EC infrastructures at the national and organisational levels and unbalanced readiness across different locations in China may be gradually be overcome with stronger government incentives and supports to accelerate the EC adoption within the banking industry in particular and other industries in China. Likewise, security issue will eventually be overcome as EC technologies and the security measures deployed become more mature. The main challenge arises from those issues related to human aspect including the low level of trust among the Chinese society which leads to misperception of the legislation and the conservative thinking that are not receptive to

changes in attitude and practices. These issues are likely to inhibit the wider diffusion of EC in among the Chinese community as they cannot be easily overcome.

While the majority of China's domestic banking industry is still at the initial stage of the EC adoption, it is likely that China will be the largest Internet market in the world in the next several years with its fast and constant economy growth and the awareness of the importance of developing EC by the Chinese government and organisations. For this to happen, the findings of this study imply that the Chinese government plays an important role in leading the EC reform and guiding the organizations and people's acceptance and involvement in EC adoption and diffusion. More efforts are needed by the Chinese government to devise and promote EC legislations to increase individuals' awareness, guide commercial transformation, introduce recent technologies, establish necessary infrastructure, and so on order to facilitate the rapid economy and e-commerce development in China. In particular, more effective fraud prevention methods are required to reduce risks and increase the online security by conducting careful risk assessment of all customers (individual and organisations), establishing a reliable user authentication by increasing the complexity and security of password, such as by involving digital certificates or digital signatures. With a higher security level, the community is expected to develop a higher level of trust over time. Coupled with a better understanding and awareness of EC benefits, the improvement in the technical aspects of EC is expected to accelerate the EC adoption and acceptance within the Chinese society.

While this study offers some useful insights into EC adoption within the Chinese banking industry, further studies that look at the adoption of EC in other industry sectors would be valuable to complement this study's findings. Such studies would also provide the replication logic necessary to improve the generalisability of the current findings.

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