Business-to-business adoption of eCommerce in China

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Abstract

There is an absence of research on business-to-business eCommerce in developing countries which covers wide-ranging issues beyond contextual imperatives. This paper analyzes eCommerce adoption by businesses in China from internal, external and contextual perspectives.

The contributions of this paper are to extend and adapt the Perceived eReadiness Model [A. Molla, P.S. Licker, eCommerce adoption in developing countries: a model and instrument, Information & Management (42) 2005, pp. 877–899; A. Molla, P.S. Licker, Perceived E-Readiness factors in e-Commerce adoption: an empirical investigation in a developing country, International Journal of Electronic Commerce 10(1), 2005, pp. 83–110] to eCommerce in China in an empirical study of 134 Chinese SME’s. This study validates the Perceived eReadiness Model [53,54]. It further analyzes the contextual and organizational factors that affect business-to-business eCommerce adoption in China. Findings show that the important inhibiting factors in China are restricted access to computers, lack of internal trust, lack of enterprise-wide information sharing, intolerance towards failure, and incapability of dealing with rapid change. These variables are analysed in the context of Chinese culture.

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Keywords: eCommerce adoption; Developing countries; Business-to-business eCommerce; China

1. Introduction

Although it has been acknowledged widely that the adoption and diffusion of eCommerce by businesses in developing countries is an important economic indicator of growth [53,54], there are few empirical studies [19,23,45,57,75] and only one comprehensive model [53,54]. This model was tested once, in development.

The contributions of this paper are to adapt, extend and empirically test the pioneering Molla and Licker Model [53,54] in the context of China. The objective is to provide a validated predictor of business-to-business eCommerce adoption in China. This may then be applied to wider contexts.

China has a land mass of 9.6 million km² [26], population of 1.29 billion in 2003 [26], and an annual growth rate of 9% [5]. It is an important country for analysis of eCommerce development in business markets, emerging markets and transitional economies. As in many developing countries, data are difficult to collect and interpret.

This paper is structured as follows. First, we introduce the study, which is followed by a review of eCommerce in developing countries. We then present the theoretical background of the models of eCommerce adoption, followed by an analysis of the context in China, and methodology. Finally, we discuss our results,
analyze them in the context of China, and draw out managerial implications. Limitations of our research and indications for further research conclude the paper.

2. eCommerce in developing countries

The adoption of business-to-business eCommerce in developing countries differs greatly from developed countries. Developing countries often lack the necessary financial, legal, and physical infrastructures for the development of eCommerce. In addition, developing countries often have different cultures and business philosophies, which limit the applicability and transferability of the eCommerce models designed by Western countries [25,35,53,54].

3. Theoretical background

It is important for businesses moving to the business-to-business eCommerce sector to evaluate all aspects of their organization and performance. The business needs to identify factors which will determine successful transformation, and then direct strategy and resources towards those factors [53,54].

The literature on eCommerce adoption by businesses suggests that most research is based on four frameworks:

(1) The diffusion of innovation [7,52,66,91].
(2) The Technology-Organization-Environment Model (TOE) [49,74,84,89,91].
(3) Institutional theory [12,67].
(4) Resource-based theory [6,91].

Models based on these theories have different foci, and are designed to examine different aspects of business eCommerce adoption. Some models examine only the external environment of firms [25,35,48], while some are focused on technological aspects [15].

Models drawing upon the Technology-Organization-Environment Model framework [49,84,91] attempt to examine the organizational context of eCommerce adoption. In these models, only factors such as firm size and scope are included. Other, more important, managerial and internal organizational aspects [53,54] are left unevaluated, such as the centralization, formalization, and complexity of managerial structure, the quality of human resources, and the amount of slack resources available internally [84].

However, the main deficiency underlying all these models, from the perspective of developing countries, is that they are designed for developed countries. Issues which might seem trivial in developed countries may play an important role in business-to-business eCommerce adoption in developing countries, such as tolerance of failure.

Molla and Licker's [53,54] Perceived eReadiness Model identifies many of the relevant contextual and organizational factors that might affect eCommerce adoption in developing countries [53,54]. The model includes two major constructs which measure both endogenous and exogenous factors: Perceived Organizational eReadiness and Perceived External eReadiness [53,54].

Perceived Organizational eReadiness is defined as managers' perception and evaluation of the degree to which they believe that their organization has the awareness, resources, commitment, and governance to adopt eCommerce [53,54]. The Perceived Environmental eReadiness is the degree to which managers believe that market forces, government, and other supporting industries are ready to aid in their organizations' eCommerce implementation [53,54] (see Fig. 1).

The theoretical root of this model is interactionism, which allows for a multi-perspective audit of the managerial, internal organizational, and external con-
textual issues to provide meaningful predictors of business-to-business eCommerce adoption in developing countries [53,54].

The Perceived eReadiness Model is more comprehensive than earlier models, as it includes both extensive external environmental and internal organizational issues [53,54]. It is more relevant for this context than earlier models, as it is specifically designed for developing countries [53,54]. Further, beyond the initial adoption of eCommerce, the model also examines its institutionalization, which few models to date have covered [91].

However, there are some limitations to the Perceived eReadiness Model, such as

Table 1
Description of the variables in the Perceived eReadiness Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Descriptors and references</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business typology</td>
<td></td>
</tr>
<tr>
<td>Sector</td>
<td>Indicates whether the sector of the company, services or manufacturing, plays any role in eCommerce adoption [72,73,89,90]</td>
</tr>
<tr>
<td>Firm size</td>
<td>Refers to the number of employees in the whole organization, which is one of the most commonly cited factors in the innovation literature [25,83,84,89,90]</td>
</tr>
<tr>
<td>Perceived organizational eReadiness</td>
<td></td>
</tr>
<tr>
<td>Educational level of employees</td>
<td>An evaluation of possible technical knowledge and understanding of the employees which are considered vital in eCommerce adoption [2,8,11,25,48]</td>
</tr>
<tr>
<td>Awareness</td>
<td>Represents perception of eCommerce elements in the environment; comprehension of their meaning through an understanding of eCommerce technologies, business models, requirements, benefits and threats and projection of the future trends of eCommerce and its impact [8,22,31,43,50,76]</td>
</tr>
<tr>
<td>Commitment</td>
<td>Reflects enough energy and support for eCommerce from all corners of an organization and especially from the strategic apex. It refers to having a clear-cut eCommerce vision and strategy championed by top management, eCommerce leadership and organization wide support of eCommerce ideas and projects [3,12,16,55,64,79]</td>
</tr>
<tr>
<td>Human resources</td>
<td>Refers to the availability (accessibility) of employees with adequate experience and exposure to information and communications technology (ICT) and other skills (such as marketing, business strategy) that are needed to adequately staff eCommerce initiatives and projects [52,63,92,93]</td>
</tr>
<tr>
<td>Technological resources</td>
<td>Refers to the ICT base of an organization and assesses the extent of computerization, the flexibility of existing systems and experience with network based applications [33,46,63,70,92,93]</td>
</tr>
<tr>
<td>Business resources</td>
<td>This covers a wide range of capabilities and most of the intangible assets of the organization. It includes the openness of organizational communication; risk taking behaviour, existing business relationships, and funding to finance eCommerce projects [14,24,32,40,42,44,70,92,93]</td>
</tr>
<tr>
<td>Governance</td>
<td>The strategic, tactical and operational model organizations in developing countries put in place to govern their business activities and eCommerce initiatives [12,32,59,81,85]</td>
</tr>
<tr>
<td>Perceived external eReadiness</td>
<td></td>
</tr>
<tr>
<td>Government eReadiness</td>
<td>Organization’s assessment of the preparation of the nation state and its various institutions to promote, support, facilitate and regulate eCommerce and its various requirements [10,49,56,58,60,65,82]</td>
</tr>
<tr>
<td>Market forces eReadiness</td>
<td>The assessment that an organization’s business partners such as customers and suppliers allow an electronic conduct of business [4,18,43,69]</td>
</tr>
<tr>
<td>Supporting industries eReadiness</td>
<td>Refers to the assessment of the presence, development, service level and cost structure of support-giving institutions such as telecommunications, financial, trust enablers and the IT industry, whose activities might affect the eCommerce initiatives of businesses in developing countries [48,61,62,75,77]</td>
</tr>
<tr>
<td>eCommerce adoption</td>
<td></td>
</tr>
<tr>
<td>Initial eCommerce adoption</td>
<td>A business is considered to have adopted eCommerce if it has achieved an interactive eCommerce status [53,54,91]</td>
</tr>
<tr>
<td>Institutionalization of eCommerce</td>
<td>Indicates whether or not an organization has attained an interactive, or transactive or integrated eCommerce status [53,54,91]</td>
</tr>
</tbody>
</table>

* Adapted and extended from Molla and Licker [53,54].
(1) The validity and reliability were tested once only in South Africa, during development.
(2) Important industry descriptors, such as sector, firm size [84,89] and educational background of employees [2] are not included.
(3) The statistical analysis needs to be tested further in other contexts, and using other methods [53,54].

In this research, we adapted and extended the Perceived eReadiness Model to a new context, China, to further test its validity, reliability and predictive capability (see Table 1). Different statistical methods were used for the data analysis.

4. China

The People’s Republic of China is the third largest country in the world with an area of 9.6 million km² [27]. The country has 34 provincial-level administrative areas, including 23 provinces, five autonomous regions, four municipalities and two special administrative regions, and has the world’s largest population, 1.29 billion (2003), 58.2% of which are rural residents [26].

China’s 1949 planned economy was replaced in 1979 by a socialist market economic system. China is now one of the world’s major economic entities, with a high growth rate [13]. In 2004, China’s GDP was 13.65 trillion RMB (US $1.65 trillion), 9.5% higher than the previous year (see Fig. 2 [13]).

4.1. Internet and eCommerce development in China

The concept of eCommerce emerged in China in 1993, when the foreign businesses in China started to use EDI to simplify trading processes [20]. Soon Chinese businesses began to adopt this new technology [20], which subsequently developed in four phases: “Initiation” (1993–1995); “Contagion” (1995–2000); “Cooling” (2000–2004), and “Permeation” (2004 onwards) [28].

In 1994, the country’s first network – the National Computing and Networking Facility of China – was established, and connected to the global Internet through a joint project of the China Academy of Science, Tsinghua University, and Peking University [28].

The Ministry of Trade and Economic Cooperation established the China International Electronic Commerce Center in 1996 to research and promote digital business [21]. Internet-based eCommerce was launched in China in 1997, and grew suddenly in a ‘leaping’ pattern [28] in the “Contagion” Phase, then slowly, after the collapse of the dot-com bubble in 2000 (the “Cooling” Phase).

By 2004, in the “Permeation” Phase, the total number of Internet-users in China had grown to 94 million, making China the second largest Internet-user market in the world [88]. The adoption of the Internet is largely concentrated within the ten most developed provinces and autonomous municipalities, mostly along the East Coast [88].

There were 0.67 million websites in China in 2004, of which 60.7% were corporate websites [17]. Most corporate websites provide sections “About the Company (85.3%)” and “Products (81.9%)” (see Fig. 3) [17]. For other information, 56.6% have “Events”, 40.0% have “Contact Us”, 36.1% have “Product Search”, 18.6% have “Online Query” and 12.7% have “Virtual Community” [17]. Just over half (50.9%) of company websites have an online database [17].

4.2. Role of the central government

The direct intervention of the central government is important in order to promote technological innovation [68], i.e. the Internet. Enabling government policies, such as trade and telecommunications liberalization, are likely to have the biggest impact on the adoption of eCommerce. Government policies make ICT and Internet access more affordable, as well as increase pressure on businesses to adopt eCommerce to compete [25].

The Government is providing guidance on policymaking, financial investment, infrastructure development, education, human resources development, market transforming and service improvement [80]. Policies, laws and regulations for the governing of telecom, Internet services, electronic information and other service areas that provide the technical platform for eCommerce were enacted recently [29].

The Ministry of Labour and Social Security introduced the Professional Standards for eCommerce

![GDP Growth in China](image)

Fig. 2. GDP growth in China [13].
Specialists and the Regulation on National Licensing Procedure in 2001 to ensure the qualification of eCommerce specialists [86]. In 2005, the State Council issued the first national guideline dealing specifically with eCommerce development, *Some Opinions on Speeding up the Development of eCommerce*, in which the Government decided to take measures in six areas:

1. legal environment,
2. supporting industries,
3. enterprise information,
4. technical support,
5. education and
6. international cooperation [1].

However, considerable tension exists between promoting the Internet and restricting its use. The Chinese Government controls, censors and monitors all aspects of the Internet, and the international gateway, which connects China to the World Wide Web. This is done in order to restrict access to politically harmful information and to safeguard national security [57].

In summary, the increasing number of Internet users and Government guidelines promoting adoption of Internet Technology in companies is facilitating the development of eCommerce in China. However, Government control and restrictions, as well as the lack of legal regulation, is a source of considerable tension and may impede its further development.

4.3. Industry context

Data were collected from businesses located in the Yangtze River Delta Economic Region, which is made up of two provinces, Zhejiang and Jiangsu Province, and one autonomous municipality, Shanghai (see Fig. 4).

This area was chosen to test the adoption of business-to-business eCommerce because it is one of the most developed areas in China, and the focus of government support [17].

4.3.1. Zhejiang Province

Although Zhejiang is one of the smallest provinces in China, its industrial production is ranked fourth [38]. The northeast Zhejiang area is part of the Yangtze River Delta Economic Region and is the province’s economic hub [38]. It covers six cities/counties: Hangzhou, Ningbo, Jiaxing, Huzhou, Shaoxing and Zhoushan [38].

4.3.2. Jiangsu Province

Jiangsu Province is the most densely populated province in China, with GDP ranking second from 1993 onwards [36]. The southern Jiangsu area is the province’s economic hub [36]. The southern Jiangsu area covers five cities: Suzhou, Wuxi, Changzhou, Nanjing and Zhenjiang [36].

4.3.3. Shanghai municipality

Shanghai is the leading trade and financial centre of the Yangtze River Delta Economic Region as well as of
mainland China [37]. Shanghai plays a leading role in China’s manufacturing [37]. At the same time, service industries in Shanghai are developing very fast, with half of Shanghai’s GDP attributed to the services sector [37].

5. Analysis and results

5.1. Analysis

A large, quantitative, cross-sectional survey was used in this research, which was adapted and extended from Molla and Licker’s [53,54] Perceived eReadiness Model. Molla and Licker [53,54] used multiple discriminant function analysis and principal component analysis [9,71]. This research uses a different approach, as outlined below.

A five-point Likert-type scale ranging from strongly agree (1) to strongly disagree (5) was used in the questionnaire [53,54] (see attached questionnaire Appendix A). To make it more suitable for the Chinese context, modifications were made, which were:

1. Drop item ‘G6. We define a business case for each eCommerce implementation or initiative’. Given the current level of adoption of eCommerce in China, the concept indicated by this item is not likely to be understood by Chinese companies.
2. Change ‘eCommerce’ into ‘business-to-business eCommerce’, since this research was focused on business-to-business eCommerce, the largest sector by value and volume.
3. Extend and develop the research instrument to add the background questions to classify the cross-industry survey, and add industry-specific categories, such as sector and firm size.
4. The internal variable, educational level of employees, was added to measure effectiveness of the Chinese Government guideline focused on educational development [1,2,25].
The questionnaire was translated into Chinese, and administered in the Yangtze River Delta Economic Region. Recipients of the questionnaire were managing directors of companies selected using a random systematic sampling technique [53,54] chosen from the Directory of Economic Information Network, part of the China State Information Center.

All questionnaires were sent via e-mail in two waves, with a covering letter explaining the purpose of the research and how to fill out the questionnaire. The first wave was sent out in July 2005, when the first author was in China. In all, 500 questionnaires were sent, using an unforeseen random systematic sampling technique from non-patterned lists, choosing every 10th company [53,54]. Two follow-up emails were sent within the next two weeks and telephone calls were made to increase the response rate.

By the end of the pre-set deadline, August 22, 2005, 106 responses were received, with ten invalid due to missing data, making the total number of responses 96. The response rate is 21.2%. The second wave was sent out in November 2005, when the first author was in London, using a convenience sample, in which 100 questionnaires were emailed to managing directors to fill out and to circulate through their networks. It is estimated that 100 more questionnaires were circulated through networking. Two follow-up mails were sent in the following month. In all, 52 were returned, with 14 invalid. The response rate for the second wave was 26%. There were a total of 134 completed responses which were analyzed as one dataset, as the two samples were not large enough for separate analyses. The time lapse between the two waves was due to unforeseen contingencies rather than planned procedure. Responses between the two waves were compared and there was no significant difference between the two datasets.

The data analysis was structured in two steps. First, we tested the validity of the items in our dataset, to determine whether any of the items were problematic in the Chinese context. Second, we tested the predictive power of the items in determining whether eCommerce was adopted by a business, and, if adopted, to what extent this was the case.

5.1.1. Reliability analysis within the Chinese context
The questionnaire was designed originally for use in South Africa. We performed a full reliability analysis to validate it within the Chinese context. To test reliability of each question (item), we computed coefficient alphas and item-scale correlations (see Table 2).

Overall, most items performed very well in the Chinese context, with all Cronenbach alphas well over 0.8 (the accepted cut-off for reliability). Following the criterion used in the original paper of discarding items with a corrected item total correlation of less than 0.4, the following items we found deficient (see attached Questionnaire, Appendix A):

- Human Resources: Question 2, unrestricted access to computers.
- Business Resources: Question 1, internal trust.
- Business Resources: Question 3, enterprise-wide information sharing.
- Business Resources: Question 5, tolerance towards failure.
- Business Resources: Question 6, capability of dealing with rapid changes.

This showed that the categories Human Resources and Business Resources were problematic in the Chinese context. To be able to assess Human Resources and Business Resources categories, we opted to use a lower cut-off point of 0.25 for the corrected-item total correlation. We feel this threshold value was appropriate, as it still gave us correlations significant to less than 1%. This led to Business Resources Question 3 being rejected as the only item that did not meet the criterion.

At a category level, we obtained reasonably good consistency, with most categories having an overall Cronenbach alpha bigger than 0.8 (see Table 3). The only two categories that fell short of this standard (Human Resources and Business Resources) were the ones which included problematic questions in the Chinese context (see above).

5.1.2. Predictive power of the questionnaire
We used linear discriminant analysis to test the predictive power of the model. Highly correlated predictors can be problematic within the discriminant analysis framework [41], so we computed category means. This approach is statistically robust and makes the interpretation more straightforward [41]. Our models were significant in predicting initial adoption ($F_{42,91} = 3.43, p < 0.001$) and the level of adoption ($F_{18,152} = 1.78, p = 0.032$).

For predicting adoption, the most important variable was Government eReadiness (GVeR), followed by Business Resources (BR) and Human Resources (HR). Businesses with high values in Technological
Resources (TR) and Governance (G), on the other hand, were not likely to have adopted eCommerce. For predicting the level of adoption, Government eReadiness was again important, together with Commitment (C), Supporting industries eReadiness (SleR) and Human Resources.

Our questionnaire also included three background questions that defined the type of business (size, type,
educational level of employees). Comparing businesses that had either gone though an initial adoption of eCommerce versus businesses that did not adopt eCommerce, there was no difference in Background 1 – sector ($W = 1877$, $p = 0.316$), but there was a significant difference in Background 2 – firm size ($W = 1490$, $p = 0.005$) and Background 3 – educational level of employees ($W = 1718$, $p = 0.031$). When considering only businesses that adopted eCommerce, the level of adoption was not affected by sector (Spearman rho = $-0.129$, $p = 0.237$), there was a trend with firm size (Spearman rho = $0.187$, $p = 0.085$), and not by educational level of employees (Spearman rho = $0.065$, $p = 0.553$).

5.2. Results

5.2.1. Firm size

Firm size is one of the most popular factors studied in innovation [84], such as Internet and eCommerce adoption.

Firms surveyed in this research are categorized into three groups according to the number of employees in the whole organization: Small firms with 50 or less employees; medium firms with 50–500 employees and large firms with more than 500 employees.

We found that the level of business-to-business eCommerce adoption was significantly affected by firm size in two ways. While large firms are usually in possession of more technology, finance and human resources, which are called ‘Resource Advantages’ [84] that they can use to leverage eCommerce investment over a large revenue base [25], they also have a great disadvantage known as ‘Structural Inertia’ [84].

In this case, the complex structure of the firm may deter the implementation of new systems, making it less flexible to new changes. Although SMEs often suffer from the lack of financial resources, they are usually quicker to adapt to meet new market needs [87]. This is consistent with Zhu and Kraemer’s (2005) finding about the relationship between firm size and eCommerce adoption [91].

5.2.2. Human Resources: Question 2 “most of our employees have unrestricted access to computers” [53,54]

Firms investigated in our research show a poor performance in employees’ free access to computers within the organization. This may be the result of the lack of funds to purchase equipment and technology, which is in accordance with previous research [25,34]. This especially holds true for SMEs whose management may be dissuaded from investment when the ROI is low.

5.2.3. Business Resources: Question 1 “our people are open and trusting with one another”; Question 3 “our organization exhibits a culture of enterprise-wide information sharing” [53,54]

We found that trust among employees and the culture of enterprise-wide information sharing have considerable impact on business-to-business eCommerce adoption, and its later institutionalization, in China. We discuss these two aspects together, as the extent of information sharing is closely related to the degree of inter-personal trust in China.

The Chinese have a long tradition of distrust, due to the hostile social psychological and sociological environment over millennia [47]. China has a considerably high Power Distance index, which indicates a high level of inequality of power in Chinese society [39]. For centuries, China was under the rule of Emperor-led, centralized government. Implementation of laws was subject to the personal interpretation of officials, many of whom were corrupt, and bribery was widespread. This bred a deep sense of distrust, which still exists [47]. Distrust is not only widespread, but also exists within institutions and businesses, which exhibit an unwillingness to share information, both internally and externally [34].

In businesses, as well as inter-personal relationships, a culture of relationship-building, known as “guanxi”, exists between two or more persons who have a commonality of shared identification [47]. These relationships are built upon personal trust and used widely to recruit “one’s own people” to get personal control of the business [47]. Information, as a key source of power in Chinese business culture, is only passed selectively to individuals who are proven trust-worthy or as “insiders” [51]. “Guanxi” is accepted widely in the Chinese business world, which operationally means that

Table 3

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Cronenbach alpha</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>0.91</td>
</tr>
<tr>
<td>BR</td>
<td>0.70</td>
</tr>
<tr>
<td>C</td>
<td>0.91</td>
</tr>
<tr>
<td>G</td>
<td>0.92</td>
</tr>
<tr>
<td>GVeR</td>
<td>0.78</td>
</tr>
<tr>
<td>HR</td>
<td>0.59</td>
</tr>
<tr>
<td>MFeR</td>
<td>0.86</td>
</tr>
<tr>
<td>SleR</td>
<td>0.83</td>
</tr>
<tr>
<td>TR</td>
<td>0.82</td>
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</tbody>
</table>
the amount of information employees receive reflects the degree to which they are trusted [51]. However, this cultural, relationship-building “guanxi” also controls and prevents free information flow to “outsiders”, and therefore hinders the adoption and diffusion of business-to-business eCommerce in China.

In addition, even if culturally based impediments to information flow were lifted, problems in information sharing and understanding would still arise. As the Chinese languages are succinct in words, but rich in meaning, by using an electronic information sharing system, the subtle cues from tone of voice, facial expression and body language, which would otherwise be interpreted for full understanding of the words, would be missing [51].

There is, therefore, a deep, irreconcilable, socio-cultural tension in the Chinese cultural environment, which is an impediment to the development of business-to-business eCommerce. In China, the spoken language accounts for only a small part of the meaning. This finding identifies areas which merit further research in the context of eCommerce in China.

5.2.4. Business Resources: Question 6 “our organization is capable of dealing with rapid changes” [53, 54]

As many of the business-to-business eCommerce activities are visible on the Internet and the wide connectivity of the Internet in itself accelerates information and resource mobility [84], competitors may soon imitate what firms are doing. This leads to quick market changes, and therefore it is important for firms to be capable of dealing with rapid change.

However, our research shows that dealing with rapid change seems to be problematic in China. China has had a centrally planned economy since 1949. Economic reform has taken place after the cultural revolution in 1979, and China is now on its way to becoming market-oriented [26]. However, a socialist market economy will not be achieved until 2010, and will not become mature until 2020 [26].

The limited scope of information sharing may also be an inhibitor, and act as a brake against rapid changes. Without immediate and correct information, it is impossible to deal effectively with changes, or even to detect the changes.

Chinese culture is therefore conditioned to slow responses, and has difficulty in dealing with rapid change, therefore creating considerable tension between government control, the population’s increasing market orientation and culture.

5.2.5. Business Resources: Question 5 “failure can be tolerated in our organization”

One significant finding in our study is that the organizational attitude towards failure is viewed as important in business-to-business eCommerce adoption. eCommerce, as an advanced technology with significant managerial implications, could be said to be one of the most important innovations of the 20th century. Like innovations as a class, the adoption and diffusion of eCommerce is a “process through which an individual or other decision-making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision” [66].

Hence, aggressive, innovation-oriented firms will form strategies that are more likely to promote activities with attitudes which are open to innovation [24, 30, 42, 70]. These strategies can be interpreted as encouraging initiatives in eCommerce adoption, and being more tolerant towards failures on the way of exploration.

Findings from health psychology from the perspective of adoption decision processes tell us that adoption behaviours are dependent on the adopter’s decisional balance [24, 78]. For adoption to occur, the perceived positive attributes need to outweigh negative ones [24]. The extent to which perceived positive attributes outweigh negative ones determines the rate of the adoption and diffusion process over time [24]. A plausible explanation for the findings in China surrounding tolerance of failure may be that, although the positive attributes of eCommerce outweigh negative forces, they are not significant enough to overcome cultural inhibitors. Firms are not fully engaged in the adoption and diffusion process, as they are restricted by the lack of business and human resources and the socio-cultural inhibitors discussed above.

6. Conclusions

The aim of our research was to adapt, extend, test and validate the Perceived eReadiness Model to help assess the internal organization and the external environment [53, 54] in the context of business-to-business eCommerce adoption in China. Results from our research show that the Perceived eReadiness Model works in China.

Our study finds that, contrary to previous research that the external environment plays the major role in eCommerce adoption, in China the internal
organizational factors are inhibiting eCommerce adoption and diffusion.

Generally, the Perceived Environmental eReadiness categories are relatively positive towards eCommerce adoption in China. The Central Government shows great enthusiasm towards the adoption of eCommerce, and has been offering support in terms of policy and extensive investment in supporting industries to facilitate eCommerce. However, it enforces strict censorship in tandem with support, which creates considerable tension.

The major problems, however, lie in Perceived Organizational eReadiness. Our findings show that firms in China suffer from the lack of business resources and human resources, in terms of firm size, and resources available for employees to pursue innovation. However, after the 30-year domination of state-planned economy, China is still finding its feet in the adoption of the market-oriented economy. It takes time for businesses to form systems, objectives and strategies that respond directly to the market instead of reacting to government plans.

The most important finding in the context of China is the cultural issue, which has a deep influence on entrepreneurial culture in terms of trust and information sharing. Both of these categories are essential in business-to-business eCommerce adoption. However, there is considerable socio-cultural tension with these categories in Chinese firms, which inhibits the adoption and diffusion of eCommerce.

7. Managerial implications

Results from our research show that the Perceived eReadiness Model works in China. There are important implications for managers for both business-to-business eCommerce adopters, and non-adopters, in the development of strategies for eCommerce adoption. We find that most problems of business-to-business eCommerce adoption lie in the internal organizational categories of Perceived Organizational eReadiness. So, first, firms should properly allocate their business resources and human resources to balance online and offline development.

Second, our study shows that special attention needs to be paid to the delicate, culturally influenced relationship between trust and information sharing within the firms. Consequently, it is desirable to promote an open and trustful atmosphere within the organisation through internal marketing.

Third, for companies who are already adopters, it is advisable to create a more fault-tolerant atmosphere to further encourage success in eCommerce development.

8. Limitations and indications for further research

Our research was conducted in Yangtze River Delta Economic Region, which is one of the most prosperous and highly advanced areas in China. Adoption behaviours by businesses in other parts of the country, especially in rural areas, may vary considerably. Therefore, further comparative, case study research targeted at rural, remote areas with comparisons made to the advanced regions would be desirable. The discrete findings from China in this study would each benefit from further research.

In addition, the Perceived eReadiness Model [53,54] requires large, cross-cultural validation in other contexts, as well as cross-country comparisons within, for example, South-East Asia.
Appendix A. Questionnaire [53]

Exploration of business-to-business adoption of eCommerce in China.

I. Background

B1. What industry does your company fall in?
   1. Services ( )
   2. Manufacturing ( )

B2. How many employees are there in your company? Please tick the closest description.
   1. Less than 50 ( )
   2. 50-500 ( )
   3. More than 500 ( )

B3. What is their general educational level?
   1. High School ( )
   2. Undergraduate ( )
   3. Higher than Undergraduate ( )

*On the scale of 1 (Strongly Agree) to 5 (Strongly Disagree), please indicate your level of agreement with the following statements, and write in the blank below the question.*

Scale: 1, Strongly Agree;
   2, Agree;
   3, Neutral;
   4, Disagree;
   5, Strongly Disagree.

II. Awareness

A1. Our organization is aware of B2B eCommerce implementations of our partner organizations
   ( )

A2. Our organization is aware of our competitors’ B2B eCommerce and e-business implementations
   ( )
Appendix A. (Continued)

A3. Our business recognizes the opportunities and threats enabled by B2B eCommerce

A4. Our organization understands B2B eCommerce business models that can be applicable to our business

A5. We understand the potential benefits of B2B eCommerce to our business

A6. Our organization has thought about whether or not B2B eCommerce has impacts on the way business is to be conducted in our industry

A7. Our organization has considered whether or not businesses in our industry that fail to adopt B2B eCommerce and e-business would be at a competitive disadvantage

III. Human Resources

HR1. Most of our employees are computer literate

HR2. Most of our employees have unrestricted access to computers

IV. Business Resources

BR1. Our people are open and trusting with one another

BR2. Communication is very open in our organization

BR3. Our organization exhibits a culture of enterprise wide information sharing

BR4. We have a policy that encourages grass roots B2B eCommerce initiatives

BR5. Failure can be tolerated in our organization
Appendix A. (Continued)

BR6. Our organization is capable of dealing with rapid changes


V. Technological Resources

TR1. We have sufficient experience with network based applications


TR2. We have sufficient business resources to implement B2B eCommerce


TR3. Our organization is well computerized with LAN and WAN


TR4. We have high bandwidth connectivity to the Internet


TR5. Our existing systems are flexible


TR6. Our existing systems are customizable to our customers’ needs


VI. Commitment

C1. Our business has a clear vision on B2B eCommerce


C2. Our vision of B2B eCommerce activities is widely communicated and understood throughout our company


C3. Our B2B eCommerce initiatives have champions


C4. All our B2B eCommerce initiatives have champions


C5. Senior management champions our B2B eCommerce initiatives and implementations


Appendix A. (Continued)

VII. Governance

G1. Roles, responsibilities and accountability are clearly defined within each B2B eCommerce Initiative

() 

G2. B2B eCommerce accountability is extracted via on-going responsibility

() 

G3. Decision-making authority has been clearly assigned for all B2B eCommerce initiatives

() 

G4. We thoroughly analyze the possible changes to be caused in our organization, suppliers, partners, and customers as a result of each B2B eCommerce implementation

() 

G5. We follow a systematic process for managing change issues as a result of B2B eCommerce implementations

() 

G6. We have clearly defined metrics for assessing the impact of our B2B eCommerce initiatives

() 

G7. Our employees at all levels support our B2B eCommerce initiatives

() 

VIII. Market forces eReadiness

MFeR1. We believe that our customers are ready to do business on the Internet

() 

MFeR2. We believe that our business partners are ready to conduct business on the Internet

() 

IX. Government eReadiness

GVeR1. We believe that there are effective laws to protect consumer privacy

()
Appendix A.  (Continued)

GVeR2. We believe that there are effective laws to combat cyber crime

GVeR3. We believe that the legal environment is conducive to conduct business on the Internet

GVeR4. The government demonstrates strong commitment to promote B2B eCommerce

X. Supporting industries eReadiness

SleR1. The telecommunication infrastructure is reliable and efficient to support B2B eCommerce and eBusiness

SleR2. The technology infrastructure of commercial and financial institutions is capable of supporting B2B eCommerce transactions

SleR3. We feel that there is efficient and affordable support from the local IT industry to support our move on the Internet

SleR4. Secure electronic transaction (SET) and/or secure electronic commerce environment (SCCE) services are easily available and affordable

XI. B2B eCommerce Adoption

Which one of the following best describes the current B2B eCommerce status of your company?

Please choose only one option

EAD1. Not connected to the Internet, no e-mail.

EAD2. Connected to the Internet with e-mail but no web site.

EAD3. Static B2B eCommerce, that is publishing basic company information on the web without any interactivity.

EAD4. Interactive B2B eCommerce, that is accepting queries, e-mail; and form entry from users.
Appendix A. (Continued)

EAD5. Transactive B2B eCommerce, that is online selling and purchasing of products and services including customer service.

EAD6. Integrated web, that is the web site is integrated with suppliers, customers and other back office systems allowing most of the business transactions to be conducted electronically

*Note:

This questionnaire is cited from ‘B2B eCommerce Adoption in Developing Countries: A Model and Instrument’ [53] only with one item ‘G6. We define a business case for each B2B eCommerce implementation or initiative’ deleted and the part ‘Background’ added. The modification was made because this research was a cross-industry survey, and industry sector and size were important categories. The omission of G6 is because considering the current level of adoption of B2B eCommerce in China, the concept indicated by this item is less likely to be commonly understood by Chinese companies.

References


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