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Abstract

This paper reports the preliminary results of an exploratory survey of information technology usage by businesses located in regional Thailand. With growing concern about the digital divide, Thailand is an important and interesting region to study. There has been very little prior research that has examined the take-up of information technology in this region. The research context for this study is particularly important for two reasons. Firstly, Thailand is considered a rapidly developing country in the Asia Pacific region and, secondly, the regional area of Chiang Mai where the survey was conducted has a population of less than 5% of that of Bangkok the capital of Thailand. The results of this study show a high rate of technology acceptance and use. The findings also indicate that the Internet has achieved wide acceptance as a means of doing business.

Keywords

Electronic enablement, technology adoption, developing countries

Introduction

According to the World Bank and the Asian Productivity Organisation, information technology provides developing countries with the opportunity to accelerate economic development (Fong 2000). Information and communication technology (ICT) can enable businesses in developing countries to quickly e-enable their businesses and advance their businesses into the global economic sphere of the Internet. The term e-enablement used in this study refers to the use of ICT to facilitate opportunities for businesses to use electronic means of communication, information gathering and dissemination and to conduct daily tasks, in the transaction of their daily business. The types of technology being discussed in this paper are information systems, business systems and the Internet. Thong and Yap (1995) initially explored the organisational characteristics and information technology adoption in Thai small businesses. Chieochan, Lindley and Dunn (2000) expanded on this research by looking into the factors affecting the use of information technology in Thai agricultural cooperatives. In contrast, this paper expands the literature by exploring the degree of technology innovation and Internet usage within Thai businesses located in the Chiang Mai district of Thailand.

Literature Reviews

Technology Progression in Thailand

In the early 1980's computers were visible in some businesses, homes and government offices, but not widely used, as they were expensive and incomprehensible for most Thais, due to the lack of Thai language software and the lack of computer standardisation (Palasri, Huter and Wenzel, 1999). In early 1988, the Australian International Development Plan (IDP) assisted the Prince of Songkla University (PSU), the Asian Institute of Technology (AIT) and Chulalonghorn University (CU) to set up the first email computer network in Thailand (Palasri, et al, 1999).

Initially the Thai Government was slow to acknowledge the importance of the Internet and react to the country's shortage of human resources by limiting the access to the Internet, to state academic institutions and Government agencies (Palasri, et al, 1999). But in recent years the Thai Government working through the IT-2000 project (the Telecommunications Master Plan), with NECTEC and TOT, telecommunications and Internet providers, intend networking to every school in the country for free (Palasri, et al, 1999). This will provide access for schools and communities to utilise the Internet for information and education. As of February 1998, more than 350,000 individuals in Thailand were using the Internet (Tansetthi, Koanantakool and Kulatumyotin, 1998), the growth is impressive compared o the early 1990's when email was used by only 100 Thai researchers (Palasri, et al, 1999).

Significant moves by the Thai Government in the past two years have highlighted their preparedness to address the obstacles in initiatives announced by Thaweesak Koanantakool. At the presentation in Singapore in 2000, Koanantakool (2000) included information about further Government initiatives noting that the Thai Government has provided NECTEC/NSTDA with funding to speed up its Research and Development (R&D) of wireless local loop, with a view that this technology can be applied to rural telephones and fixed terminals for private households. Further research was also being considered in secure mobile commerce using Thai language in areas such as providing keyboards that offered Thai language character use, display panels, short messages and Wireless Application Protocols. Other R&D programs include 3G mobile phones, computer-telephone integration and call centres (Koanantakool, 2000).

His Excellency the Prime Minister Thaksin Shinawatra, in Thailand further supported these initiatives, when the future of Telecommunications and Information Technology and the direction of the nation as a whole were highlighted in his Delivery to the National Assembly. In this address H.E. Prime Minister Thaksin Shinawatra, highlighted a range of policies, which were to be his Governments focus for Thailand (Shinawatra, 2001).

Cultural Factors

Underlying all the projects, initiatives and the uptake of e-enablement in Thailand is the cultural impact on daily working life and business management approaches. In their study "Cultural Context and its Impact on Requirements Elicitation in Thailand, Thanasankit and Corbitt demonstrated, through interviews, the difficulty that Thais felt in decision making. As "trust and relationships with others are the basis of the Thai culture, relationship oriented behaviour happens more commonly than work-orientated behaviour in Thai society and it's organisations" (Thanasankit and Corbitt, 2000. Sorod, 1991). Thai decision-making is commonly not a team approach as in western countries. Subordinates in Thai organisations

accept that their superiors make decisions in an authoritarian way (Thanasankit and Corbitt, 2000. Holmes and Tangtongtavy, 1995). Thai culture does not encourage subordinates to take "risky" initiatives for fear of making mistakes. (Thanasankit and Corbitt, 2000).

Hofstede (1991) argues that Thai culture is one with high power distance where there is considerable dependence on subordination to bosses and where "subordinates respond by either preferring such dependence (in the form of an autocratic or paternalistic boss), or rejecting it entirely. In psychology, this concept is termed counter dependence: that is dependence, but with a negative connotation, being the emotional distance between subordinates and their bosses is large; subordinates are unlikely to approach and contradict their bosses directly" (Chieochan et al, 2000, Thanasankit et al 2000, Thong, 1999). High power distance creates tall organisational structures for most Thai organisations. The power-oriented culture in Thailand usually tends to create respect for the leader as the father figure of the organisation. Rohitratana (1998) suggested, "Due to paternalism and dependence, the concept of a 'flat structure' in an organisation, which entails speedy decisions cannot effectively take place. The reason is that only those at the top can possibly make decisions; that is their obligation, to operate as 'fathers'". Thais perceive the role of 'leader' as a controller rather than a colleague. This may be called 'superior-inferior' concept, which is dominant in Thailand." (Thanasankit *et al.*, 2000)

Danish Research Unit for Industrial Dynamics (DRUID) identifies two models for developing countries to follow (Earnst and Lundvall, 1997) that would address part of the e-enablement issue facing Thailand. This is also supported by Abdulsomad (Abdulsomad, 1999, Rasiah, 1999 and Jomo 1994) who goes on to say, "for the majority of developing countries, the main concern is to create the necessary institutions that provide incentives for and externalities necessary for domestic learning." Further highlighting the "need to develop hybrid forms of institutions that combine the advantages of both models in a way that is appropriate to their idiosyncratic needs and capabilities."

Methodology

Selection of Subjects

An Internet business directory company within the Chiang Mai area provided samples of randomly preselected businesses. Chiang Mai Mall Dot Com Co. Ltd assisted in obtaining suitable accommodation including office space with a computer, phone and vehicle as required. They offered a limited selection of clients from their database to use as subjects for the research. This information was limited in number as well as information in order to maintain the anonymity of their clients; only the company name and addresses were offered for use at this time. Chiang Mai Mall Dot Com Co. Ltd also facilitated the introduction to Management and Staff with other business establishments, who offered assistance in translation, preparation of the surveys for posting to the subjects, and post data collection interviews.

Preparation of the survey, required care to avoid ambiguities in expression and to reduce confusion and lack of understanding of what was required when answering the survey questions. Thailand's 2000 Population and Housing Census were referenced to determine the validity of using English in the survey. The survey was then given to a Thai national manager working in Chiang Mai, for comment to further confer the ease of readability and translation for other Thai managers/CEO's. He concurred that the survey was suitable as prepared but

offered that some Thai explanation of some of the words used would be useful. The final survey was posted out to the subjects with a covering letter of introduction from the Internet business directory service company and a covering letter of explanation headed the survey. A returned addressed pre-stamped envelope was enclosed with the survey for easy return from the respondents. A total of 31 completed questionnaires were returned.

Although the subject information provided by Chiang Mai Mall Dot Com Co. Ltd was less than two years old, there was a significantly high "return to sender" response of 33% suggesting the volatility of businesses within Chiang Mai or the high mobility of businesses within Chiang Mai. It was not investigated whether Thailand's mail service offered a redirection of mail service as offered in Australia, which may have reduced the return rate.

The survey was divided into several broad areas for data collection. These included Business Size from Thong and Yaps study (1995) and detailed data collection questions on education and language levels. The survey also incorporated questions concerned with the CEO Knowledge as well as detailed questions pertaining to the IT skills of the staff employed and the family relationship between the CEO and any IT skilled staff. The organisational Environment and Information Intensity questions were adapted from Thong and Yaps study (1995) with minor changes for clarity. Responses were requested using a five scaled response, using the terms strongly disagree having a value of 1 and strongly agree having a value of 5. All questions within the questionnaire that required a scale value were presented in this manner to reduce respondent's confusion in translation. Other questions required a yes/no response or a figure, such as a number for the number of staff employed.

Analysis of Data

Business Profile and Competitive Environment

Table 1 shows the responses to questions about the competitiveness of the business environment. The responses suggest a perception by the subjects that their business environments were very competitive. Those businesses that answered "Not Applicable" (N/A) to the question on "Different products and services performing same functions", may suggest that they are either in a niche industry or that the products/services they offer are further advanced than their competition further suggesting that they don't perceive other businesses as being competitive in the current environment.

Competitiveness	**1** **Strongly Disagree**	**2**	**3**	**4**	**5** **Strongly Agree**	**Not Applicable**
Similar products and services	10.0%	6.67%	30.0%	13.33%	33.33%	0.0%
Intense Competitiveness	0.0%	3.33%	26.67%	23.33%	36.67%	0.0%
Different products and services performing same functions	0.0%	6.67%	20.0%	23.33%	33.33%	3.33%

Table 1. Competitiveness of Business Environment

Table 2 reports responses to the questions on the information requirements of respondents. The responses highlight the importance of information quality with over 80% of the respondents considering access to reliable, relevant and accurate information in a fast manner being very important to their business. However, it is interesting to note that the dependence on up-to-date information was not considered very important to over 35% of the respondents.

	1 Strongly Disagree	**2**	**3**	**4**	**5 Strongly Agree**	**Not Applicable**
Dependant on up-to-date information	0.0%	3.33%	33.33%	16.67%	40.0%	0.0%
Access to reliable, relevant, accurate information	0.0%	3.33%	6.67%	26.67%	56.67%	0.0%
Access information fast	0.0%	0.0%	13.33%	30.0%	50.0%	0.0%

Table 2. Information Requirement Responses

Table 3 shows the raw data responses to the business size question indicating a reasonable spread of business size subjects responding to the survey.

Number of Employees	**Breakdown of Responses**
1-9	25.81%
10-49	25.81%
50-199	25.81%
200>	9.68%
Nil Response	12.9%

Table 3. Business Size

Table 4 shows that almost 30 percent of respondents use a mainframe computer to conduct within their business.

Technology	**Usage Rate**
Facsimile	77.42%
Personal Computer	87.10%
Mainframe Computer	29.03%
Other	19.35%

Table 4. Technology Used to Conduct Business

CEO Understanding and Business Computerisation

The relationship between the CEO understanding of Computerisation and the level of Business computerisation show a strong relationship. More than 69 percent of subjects indicated that they agreed or strongly agreed with the statement "I would rate my own understanding of computers (before my company computerised) as very good compared to other people in similar positions".

This study also included a question to test the relationship between the CEO and the computer-experienced employees. As Thai culture is largely "patriarchal" and family members may have significant impact on decision making within Thai businesses, CEOs were asked how many computer experience employees were children or relatives of the subject. The responses were high with an over all 52 percent of subjects indicating that one or more of their computer-experienced employees were related, with 19 percent indicating that the computer-experienced employee was a child of the subject and a further 32 percent of those computer-experienced employees being relatives other than children of the CEO, with 6.45 percent indicating they employed both children and other relatives with computer-experience.

Education

The responses to the highest level of education achieved by employees are displayed in Table 5. The results indicate a high level of education for both male and female employees with 95 percent of employees having received some form of formal education. Although there was an indication that the male/female employee ratio was in favour of males 1:2, the ratio of males/females with formal education indicated a 1:1 in favour of female employees.

Level of Education	Gender	
	Male	Female
No Formal Schooling	0.73%	0.57%
Primary School	1.70%	6.80%
Secondary School	16.69%	22.22%
Technical or further College Education	13.76%	12.46%
University or Tertiary Institutions	11.99%	13.09%

Table 5. Highest Level of Education Achieved as a percentage across both sample gender groups

The highest education level achieved indicated an overall higher level of education for the female employees as compared to the males, except for a slight variation in the technical or further college education category.

Software Applications and Internet Usage

The respondents indicated a high usage of accounting, personnel and payroll, and sales software packaging, reducing the indicated use of software packages as the software applications indicated were more industry specific. Figure 1 indicates the number of software applications reported as being used by the respondents. More than 85 percent of respondents used 2 or more types of software applications.

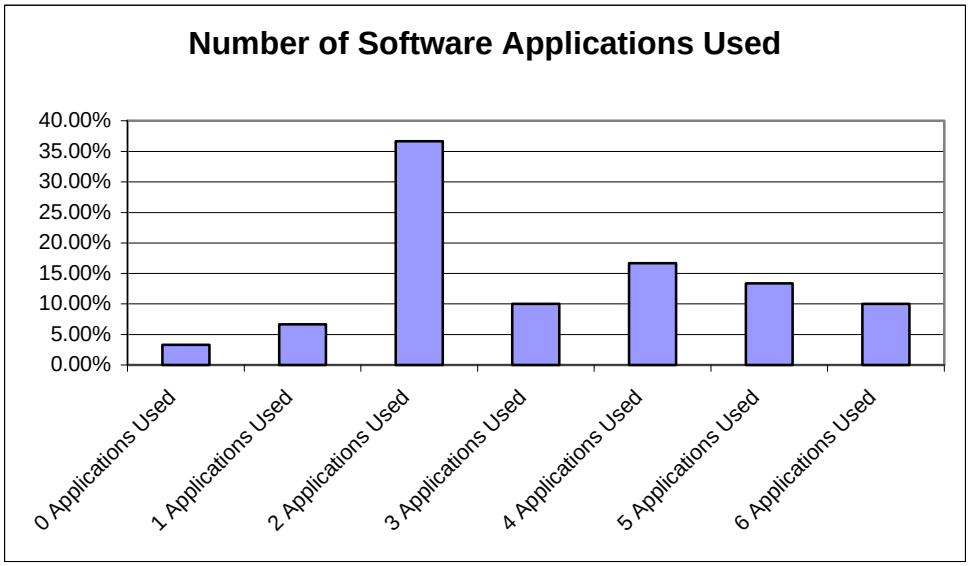

Figure 1. Software Applications in Use

The different types of software applications being used are shown in Table 6. Not surprisingly, the predominant software application domain is accounting with more than 75 percent of respondents reporting this application usage. Fifty percent of respondents also reported using personnel and payroll applications.

Software Application	Percent of Respondents
Accounting	76.67%
Inventory control	43.33%
Sales	36.67%
Purchasing	26.67%
Personnel and payroll	50.00%
CAD/CAM	13.33%
EDI	0.00%
MRP	3.33%
Others	20.00%

Table 6. Use of Software Applications

Table 7 shows the types of services that the respondents used the Internet within their businesses.

Selling goods and services	51.61%
Buying goods and services	48.39%
Banking	25.81%
Information Searches	87.10%
Email	77.42%

Table 7. Internet Usage

Although a high proportion of businesses use the Internet for Searches and/or Email, almost 50 percent of respondents also reported that they used the Internet for buying and/or selling goods and services.

Discussion

The adoption of information systems within the Thai business has some correlation to the Thai CEO's own understanding and acceptance of the new technology. This supports the previous findings that a CEO with a high degree of technology understanding encourages greater technology type use within their Thai business (Chieochan et al 2000, Thong 1999, Thong and Yap 1995).

The competitiveness of the business environment and associated information intensity requirements were previously found to be insignificant indicators between technology adopters and non-adopters in Singapore (Thong and Yap 1995). This study has shown the impact of competitiveness and information intensity on the business as having much more of an impact on Thai businesses, indicating a growing awareness of the Thai businesses to the competitive environment and the need for quality information. The disparity between previous studies and this study might be due to the rapid acceptance of the Internet in the community in the past few years, or an indication of cultural differences between the two communities studied.

Language has also been highlighted in earlier studies as an issue for those researching in Thailand. Thaweesak Koanantakool in 1997, when communicating with the researchers of "A history of the Internet in Thailand" (Palasri et al 1999) stated that as English was not a second language, as in other countries in the region, the growth of the Internet could not be sustained once it had saturated the English speakers in the country (Palasri et al 1999, Koanantakool 1997). The Thailand Government's encouragement of the use of Thai language on the Internet has also had an influence on Thai businesses accepting the Internet as a means of doing business. This has encouraged the use of the Internet by Thais in general, while maintaining the Thai culture, although this summation has not been tested. This research found that Thai businesses are using the Internet more as a business tool with an unexpectedly high 54 percent of the businesses studied having an Internet presence in the form of a home page.

Conclusion

The focus for this study was businesses within regional Thailand, specifically the Chiang Mai province. The results show a high acceptance of information systems and the Internet within Thai businesses in this region. The findings also highlight the important relationship between the CEO and the organisational acceptance of information technology and the widespread use of the Internet as a business tool within the Thai businesses surveyed. Further research is required to address a number of issues that were highlighted in the survey data in respect of the Internet and software tools being used and the interpretations and possible cultural impacts that have been identified. A broader study including a broad range of industry types would help resolve many of these issues and offer guidance for future policy initiatives targeting education and industry development needs.

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