Two Tales of One Service: User Acceptance of Short Message Service (SMS) in Hong Kong and China

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Keywords

Short Message Service (SMS), Technology Acceptance Model (TAM), SMS Acceptance, Mobile communications, Hong Kong, China.

Abstract

The Short Message Service (SMS) has been available in Hong Kong and China¹ since the late 1990s. However, the user acceptance patterns for this service have been evidently different in these two regions. Based on fieldwork in Hong Kong and China, this study attempts to explain these differences through the information technology acceptance framework, which posits that various external factors impact on a person's perceived usefulness, perceived ease of use, and subjective norms, leading to user acceptance of the SMS. This study contributes to telecommunications research by delineating the various stimuli to consider for successful technology acceptance in a global setting, which can account for differential impacts across regions. These stimuli include the economic development level, cultural differences, political censorship, business models, market competition, and input language. The findings of this study can assist telecommunications operators in formulating an effective region-specific strategy when launching a wireless data service in a particular environment.

1. Introduction

The mobile communications market has enjoyed impressive growth in both Hong Kong and China. In Hong Kong, the mobile penetration rate, namely the number of mobile subscribers per

¹ Hong Kong became a Special Administrative Region (SAR) of China on 1 July 1997 after its handover to the Chinese Government by the United Kingdom. Under the regime of 'one country, two systems', Hong Kong has independent financial, economic and legislative systems. For the purpose of simplicity, Hong Kong stands for Hong Kong Special Administrative Region of China while China stands for Mainland China in this paper.

one hundred inhabitants, has reached 116% by the end of 2004. In the same time, the total number of mobile subscribers in China has reached 334.8 million which turned China into the largest mobile communications market in the world.

However, it should be noted that subscribers do not necessarily equate to users. According to the annual reports of China Mobile (HK) - the Hong Kong listed branch of China Mobile that owns and operates mobile networks in all 31 provinces, autonomous regions and directly-administered municipalities in Mainland China, its Average Revenue Per User (ARPU) per month and its Minutes of Usage (MOU) per user per month have declined significantly over the past years. The ARPU has declined from 431 Yuan (US\$55.26) in 1997 to 92 Yuan (US\$11.79) in 2004, representing a decline of 78.7%. The MOU in 2004 was 297 minutes, a decline of 33.3% compared with 1997. According to China Mobile (HK), the declines in ARPU and MOU were mainly due to the substantial growth in lower usage subscribers, and, in particular, subscribers of pre-paid services (Yan, 2003).

In order to maximize the value of their investment in network resources and generate extra revenues from current subscribers, mobile operators in both Hong Kong and China have started to introduce a variety of value-added services. These services include caller number display, ring tone downloading, voice mail, call forwarding, call waiting, conference calls, long distance Internet Protocol (IP) telephony, and, in particular, Short Message Service (SMS).

Despite concerted efforts on the part of operators to upgrade their technology, in the case of China, the real growth in mobile data services currently lies in the SMS – one of the simplest value-added services based on the GSM and CDMA standards. For China Mobile (HK), the usage volume of the SMS has increased from 440.1 million messages in 2000 to 172,600 million messages in 2004 (Figure 1). On the immediate past Chinese New Year day, i.e. 9 February 2005, more than 1 billion short messages for greeting were delivered over the mobile operators' networks, which brought in revenue of about 100 million Yuan (or US\$12.1 million) within a single day.

Source: Annual Reports of China Mobile (HK)

Figure 1. The SMS Usage Volume of China Mobile (HK)

On the other hand, the diffusion of SMS in Hong Kong is much slower than expected. Figure 2 shows the sluggish growth of SMS in Hong Kong.

Source: OFTA

Figure 2. The Number of SMS in Hong Kong (in millions)

The two evidently different scenarios in Hong Kong and China give rise to an interesting research question: what are the factors that have led to such significant differences in SMS acceptance across regions? As mobile communication systems are currently moving towards the third generation system (3G) and beyond, a clear understanding of the determining factors has significant implications for both academic studies and industrial practice. For academics, besides introducing the dominant theory of technology acceptance to the telecommunications audience, a comparative study on the determinants of mobile data services acceptance across regions will extend the prior technology acceptance literature beyond technology acceptance within a single institution or within a single region. For the mobile industries, comparative studies can provide useful understanding of the external determinants of user acceptance patterns which will assist mobile operators in designing a sophisticated and region-specific strategy when launching a new mobile data service in a specific region.

This paper reports on a study of the SMS acceptance patterns in two different regions, namely Hong Kong and China, based on the authors' fieldwork. It attempts to identify the external determinants of the SMS acceptance with reference to a theoretical framework based on the theory of reasoned action (TRA) and the technology acceptance model (TAM). The next section of this paper will briefly review the relevant technology acceptance literature, particularly the TRA and TAM, and then develop a streamlined SMS acceptance framework for this study. Afterwards, the research methodology is elaborated upon, followed by discussion of the findings. Finally, Section 5 concludes this study.

2. Theoretical Framework

There has been a cadre of studies addressing the issue of technology acceptance, both from the organizational perspective (Zaltman et al., 1973) and from the social psychology perspective (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). More specifically, the issues concerning the acceptance of information technology have also been well studied (Davis, 1989; Venkatesh and Davis, 2000; Murugan et al., 2002; Venkatesh et al., 2003). In the technology acceptance literature, two theories that have been widely used to analyze technology acceptance are the theory of reasoned action (TRA) and the technology acceptance model (TAM).

2.1. Theory of Reasoned Action

From the social psychology perspective, many studies have been conducted to establish the intention models as appropriate theoretical foundations to study the determinants of user behaviour. One well-established intention model that has proven effective in analyzing and forecasting a person's consciously intended behaviour across research areas is the TRA (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). According to this theory, a person's performance of a specified behaviour is determined by his or her behavioural intention to conduct this behaviour, while behavioural intention is jointly determined by the person's attitude towards the behaviour and subjective norms of important others concerning the behaviour in question.

Figure 3. Theory of Reasoned Action (TRA)

Behavioural intention is a measure of the strength of one's intention to perform a specified behaviour. Attitude is defined as an individual's positive or negative feelings about performing the target behaviour (Fishbein and Ajzen, 1975). According to the TRA, a person's attitude is determined by his or her salient beliefs about the consequences of performing the behaviour and the evaluation of those consequences. Subjective norms refer to "the person's perception that most people who are important to him think he should or should not perform the behaviour in question" (Fishbein and Ajzen, 1975). In the TRA, a person's subjective norms are determined by his or her normative beliefs and his or her motivation to comply with these beliefs.

2.2. Technology Acceptance Model

While the TRA is a general model that is designed to explain virtually any human behaviour, and has been widely used in applied research settings spanning a variety of subject areas, Davis (1986) introduced an adaptation of TRA, namely the technology acceptance model (TAM), which is specifically used for modelling user acceptance of information technology. The goal of the TAM is to provide an explanation of the determinants of technology acceptance that is general and capable of explaining user behaviour across a broad range of technology while being both parsimonious and theoretically justified.

The TAM identifies a small number of fundamental variables addressed in previous studies about human psychology and behaviour, and uses the TRA as a theoretical backdrop for modelling the theoretical relationships among these variables. It posits that two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for technology acceptance behaviours (Figure 4). Perceived usefulness is defined as the prospective user's subjective probability that using a specific system will increase his or her job performance (Davis, 1986; Davis, 1989). Perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort (Davis, 1989).

Figure 4. Technology Acceptance Model (TAM)

The TAM is a commonly used model in the information systems (IS) literature on users' technology adoption behavior (Davis, 1986, 1989; Igbaria, et al., 1997; Lee, 1999; Weber, 2002; Sussman and Siegal, 2003) and is regarded as a core theory in the IS discipline. Initially, the TAM did not include the TRA's subjective norms as a determinant of behavioural intention, but the later revised models such as the TAM2 and the Unified Theory of Acceptance and Use of Technology (UTAUT) have included this variable, sometimes under different terms such as social pressure (Venkatesh and Davis, 2000; Murugan et al., 2002; Venkatesh et al., 2003). Many studies on technology acceptance have found that there are positive relationships between a person's levels of perceived usefulness, perceived ease of use, subjective norms, and actual system acceptance. In addition, the TAM and its variants propose that there exist external

variables that affect a person's levels of perceived usefulness, perceived ease of use, and subjective norms. The nature of these external variables depends on the particular research contexts and can be psychological variables, organizational variables, or economic variables (Igbaria, et al., 1997; Sussman and Siegal, 2003).

For the purpose of answering our research question, this study attempts to identify the external variables that have direct relevance in the specific context of SMS acceptance. Accordingly, as illustrated in Figure 5, a streamlined theoretical framework addressing SMS acceptance from the perspectives of perceived usefulness, perceived ease of use and subjective norms is established. As the TRA and the TAM are solid theoretical models that have been tested rigorously, it is not the intention of this study to test those models again but to use them as the theoretical base to guide our research into why there are different patterns of SMS acceptance across regions. This study will adopt a mainly qualitative approach based on a case study of the SMS acceptance patterns in Hong Kong and China.

Figure 5. Streamlined SMS Acceptance Model

3. Research Methodology

The data collection was structured into three phases of fieldwork and used multiple methods, including interviews, focused groups, and a survey. By utilizing multiple data collection methods, we have greater confidence in the findings generated. In the first phase of data collection, we conducted a series of unstructured interviews with 10 users in Hong Kong and China on their usage behavior of the SMS. The purpose of this phase was to obtain a general picture of the development of SMS in these two regions. The list of interview questions included the frequencies of SMS usage, the types of message they normally send and receive, and their reasons for using or not using the SMS, among others.

In the second phase of data collection, we used focus groups of experts to discuss various issues relating to SMS acceptance. In early 2002, more than 40 senior executives of China Mobile came to the HKUST Business School for executive training. These senior executives were divided into six groups and mixed with 12 alumni from the school's MBA program. All the alumni are in the telecommunications industry and possess telecommunications experience in Hong Kong. On the basis of the unstructured interviews from the first phase of data collection, a list of questions on why the SMS is so popular in China but not in Hong Kong was assigned to the focused groups. In all focused groups, the senior executives from China Mobile had intensive discussions with their counterparts from Hong Kong. The authors acted as facilitators of these focus groups and took notes on the discussions. This phase of data collection generated lots of qualitative data addressing the different patterns of SMS acceptance between Hong Kong and China.

Finally, in the third phase of data collection, a survey was conducted for the purpose of collecting some quantitative data to supplement the qualitative data from the previous two phases. Due to the difficulty of conducting a nationwide survey in China, which has a population of 1.3 billion people, we decided to select Beijing as a sample region of China. Under the supervision of one of the authors, a team consisting of three students was formed to conduct a survey in Hong Kong and Beijing in the mid 2002.

There are several reasons for picking Beijing, the capital of China. First, similar to Hong Kong, Beijing is a metropolitan city that is at the forefront of adopting new technology including mobile communications services. This criterion is important as the majority of mobile users in China are located in urban areas. Second, like China as a whole, Beijing is at very different levels of economic development and information infrastructure from Hong Kong, and therefore can provide a contrast to Hong Kong. Table 1 provides some statistical data highlighting these differences.

Table 1. Statistical Data on Beijing and Hong Kong (2002)

Indicators	Beijing	Hong Kong
Population	14,852,000	6,786,000
GDP per capita	US\$3,437	US\$24,911
Fixed-line Penetration Rate	39.42%	55.17%
Mobile Penetration Rate	61.9%	85.3%
Internet Penetration Rate (2003)	13.7%	46.9%

Source: ITU Database, <http://www.bjstats.gov.cn>, <http://www.info.gov.hk/censtatd>

As a manipulation check on whether a comparison between Hong Kong and Beijing can be used as a surrogate for a comparison between Hong Kong and China, we examined the patterns of SMS acceptance in the survey data collected. Importantly, the survey data confirmed that the subscribers' frequency of SMS usage in Beijing and Hong Kong are evidently different (Figure 6). This result indicates that a comparative study of Hong Kong and Beijing could, to some extent, explain the significant differences in SMS acceptance between Hong Kong and China.

Source: Survey data

Figure 6. Frequency of SMS Usage

The survey was conducted in the middle of 2002. A questionnaire was designed using standard items from prior technology acceptance studies (Davis, 1989; Venkatesh and Davis, 2000). In all cases, multiple items were used to measure a person's levels of SMS acceptance, perceived usefulness, perceived ease of use and subjective norms. A convenient sampling method was used to collect data in Beijing. Team members distributed the questionnaires via e-mail to their friends, classmates, and relatives in Beijing. In the end, 200 completed questionnaires were received from the Beijing sample.

For the Hong Kong segment, the team used both random sampling and convenient sampling in data collection. First, the team carried out the survey outside the subway stations and randomly asked passengers to complete the questionnaires. Second, the team used convenient sampling and asked friends and relatives to fill out the questionnaires. In the end, 124 completed questionnaires were received from the Hong Kong sample.

4. Discussion: Critical Factors of SMS Acceptance

4.1. Economic Development

In terms of GDP per capita in 2003, Hong Kong ranked No.15 and China ranked No.123 in the world (CIA, 2004). According to the International Telecommunications Union (ITU, 2002), the positive correlation between GDP per capita and the penetration of telephone is valid for almost all telecommunication services. Understandably, Hong Kong and China have different levels of information infrastructure. For example, Hong Kong's mobile penetration rate was 98% by August 2003, while that of China was 18.3%. The same level of difference also appears in other telecommunication services, such as in Internet access. By the end of 2003, the Internet penetration rate was 5.39% in China, but was 46.9% in Hong Kong (ITU, 2004). The gap in the information infrastructure has led to different preferences in choosing between technologies to send messages.

In this context, the phenomenal increase of the SMS usage in China is hardly surprising. By the end of 2002, there were 206.6 million mobile subscribers but only 49.7 million Internet subscribers. That is, for every four mobile users in China, less than one of them has an e-mail account. Additionally, according to the senior executives from China Mobile who participated in the focus groups discussion, the Personal Computer penetration rate is also low in China. The most common way to access wireline Internet is through Internet Cafés. This limited accessibility of wireline Internet implies that the wireless Internet which is more widely available is more convenient to access in China. According to Metcalf's law, namely the value of a network increases in proportion to the square of the number of users on the network (Shapiro and Varian, 1999), the value of the wireless Internet is about 16 times as high as that of the wireline Internet. Thus, subscribers in China tend to use the SMS as a substitute for e-mail. However, this is not a perfect substitution, as a SMS message is subject to a maximum limit of 160 characters, and in text format only. In addition, no files can be attached. Nevertheless, due to the difficulties in accessing wireline Internet, the SMS is perceived as a useful substitute for communications in China.

As e-mail can provide more sophisticated information without any constraints on the length of message, and files can also be attached to each individual e-mail, it is understandable that e-mail is a better choice than the SMS. Not surprisingly, e-mail is popular in Hong Kong due to the easiness of accessing wireline Internet. When participants in the survey were asked "If I want to send some messages, it is very likely that I will use the SMS", the replies in Beijing were quite different from those in Hong Kong (Figure 7). The SMS seems to be the preferred method in Beijing but not in Hong Kong due to the availability of alternative means of communications, such as the Internet.

Source: Survey data

Figure 7. Preference of Using SMS to Send Message

4.2. Cultural Differences

Due to cultural differences, users in China are reluctant to leave voice messages but are willing to leave text messages. In the interviews with mobile subscribers in China, one of the authors was told that they feel the answering machine and voicemail service are cold and do not provide the human touch. In response, according to the senior executives of China Mobile who participated in the focused groups' discussion, the mobile operators in China have launched a so-called "little-secretary" service. When the called party is not available to answer the call, the call will be automatically forwarded to a call centre where a human operator will check with the calling party if a text message needs to be sent to the called party. If requested, the human operator will type in the message and send it to the called party in the form of SMS. This arrangement is highly preferred by the callers, as they rarely leave any messages if they have to talk to a machine. Many provincial branches of China Mobile have even shut down their voicemail facilities.

In Hong Kong, however, voicemail is one of the most commonly used value-added services. Callers here are used to leaving voice messages. So far, all the six mobile operators have bundled free voicemail services in all the packages offered to their subscribers. In fact, during the interviews with the Hong Kong mobile users, the authors were told that when answering machines were introduced for fixed line telephone in the 1980s, they hated to leave voice messages too for the same reason as the current users in China. However, after many years of practice, they are now comfortable with leaving voice messages. The users in China missed this period of practice due to the fact that the penetration rate for fixed line telephone was extremely low in the 1980s and early 1990s. For instance, the fixed line telephone penetration rate was only 0.48% in 1980.

4.3. Market Competition

According to the senior executives of China Mobile, the SMS provides an economical way to communicate in China. The end-user price for sending a message is 0.10 Yuan (US\$0.012), whereas a one-minute call costs 0.40 Yuan (US\$0.048) for both calling party and called party. Currently, the minimum charged unit for mobile voice service in China is one minute. This implies that for unsophisticated communication, the short message is more cost effective. If the two communicating parties are located in two different cities, the advantage is even more evident, since the tariff for long distance mobile voice service is 0.70 Yuan (US\$0.084) per minute whereas the charge for the SMS is not distance-dependent. The high tariff for mobile voice service is a result of the duopoly operation by China Mobile and China Unicom in China's mobile service market.

In Hong Kong, the market is highly competitive. There are currently six operators operating eleven 2G networks and four 3G networks. For a region with a population of 6.8 million people, Hong Kong is undoubtedly the world's most competitive market for mobile service. Consequently, Hong Kong's mobile users enjoy very low prices for mobile voice service. For a package of HK\$88 (US\$11.28), subscribers are entitled to more than 1,000 free minutes plus free value-added services including voicemail service. That is to say, the average rate per minute is less than HK\$0.08 (US\$0.01). However, to send a SMS, the rate is HK\$1.00 (US\$0.13) per message. Hence, compared with the more expensive and one-way communication of the SMS, the cheaper and interactive voice communication is preferred by Hong Kong subscribers. As very few people use the SMS service because of its high price, the average cost per message is high due to the absence of economies of scale. In turn, it is difficult for the operators to cut their prices further in order to attract more subscribers to use SMS. A vicious circle is thus formed.

Data collected from the survey support the qualitative interpretation above. The survey data indicate that more participants in Hong Kong than in Beijing think that the SMS is expensive (Figure 8). In other words, the SMS is perceived as an economically useful means for communication in Beijing but not in Hong Kong.

Source: Survey data

Figure 8. Price Perception of SMS

4.4. Business Models

In Hong Kong and China, many wireline Internet portals provide a service that enables users to send short messages via their Personal Computers to the handsets of mobile phone users. They can also order short messages from the portals on information such as news and weather reports. In this way, the SMS acts as a bridge between the wireless Internet and the wireline Internet.

According to the senior executives of China Mobile, the business model has played a critical role in the successful development of SMS. China Mobile borrowed a successful business model from Japan's NTT DoCoMo to form a "win-win" strategy with content providers. In November 2000, China Mobile introduced the Monternet program. Under this program, content providers can access the carrier's mobile network at any place to provide nation-wide service. This is also known as the "one-stop shop, China-wide service" arrangement. China Mobile keeps 9% of the content revenues while the content providers receive the remaining 91% of the revenue. If the arrangement includes coverage for bad debts, China Mobile will increase its commission to 15%.

The Monternet program has generated an overwhelming response from content providers. By the end of 2003, more than 500 content providers have joined the Monternet program to cooperate in the mobile Internet market. As there are too many content providers, China Mobile has to implement "cherry-picking" in order to supply its limited capacities to the most valuable content providers. These content providers include Sohu, Sina, and other popular Internet portals. None of these companies have yet made any profit through their wireline Internet businesses, but Monternet has changed the landscape with subscribers paying for every message they receive. The above revenue sharing business model has led to a "win-win" situation for both the mobile operators and the content providers. They both obtained huge profit from the SMS service (China Mobile, 2003).

The business model of China Mobile has set up an effective value web that is able to provide rich information to users in the format of SMS. When the SMS is considered valuable by the users, more users will be attracted to use it. This in turn will attract more content providers to provide more valuable SMS. As a result, a positive feedback process is formed and the SMS becomes more and more popular (Shapiro and Varian, 1999; Yan, 2003).

In Hong Kong, however, mobile operators always request for exclusive content provision in order to gain an advantage over the competition. This business model may attract some specific groups of users, but overall the choices of content are limited. Additionally, this will increase the cost of content as the providers of exclusive content normally charge higher fees (Ko, 2003). In turn, the limited availability of content and their high charges will deter subscribers and make it more difficult for the operators to achieve the critical mass to support their business model.

4.5. Political Censorship

According to the senior executives from China Mobile, the short message has become a new kind of literature in China. Many interesting messages, like political jokes or short adult humours, are distributed and redistributed among subscribers. One of the reasons for this phenomenon is

that China still exerts strict censorship on politically sensitive contents and adults contents over the public media.

Hong Kong is a democratic society and enjoys freedom of speech. There are diversified public media which are subject to almost zero censorship. During the focused groups' discussion, one of the executives from China Mobile pointed out that people can easily find a tabloid newspaper in Hong Kong, with the front page criticising the government and the second page covering adult contents. Hence, there is no necessity for Hong Kong users to use the SMS as a means to access similar information.

In China, the SMS can be perceived as a useful way to bypass the government censorship and to access specific information that is normally not available in the public media. As more and more people are interested in these kinds of messages, communication through the SMS has become part of the social life in China. People may be subjected to social pressure and feel themselves isolated if they are not able to access these kinds of messages and share them with others.

4.6. Input Language

In China, to input the Chinese language on the mobile phone is relatively easy as "Pinyin", a way of spelling the Chinese characters with English alphabets is very popular and easy to use. Pinyin has been taught in almost all primary schools since the early 1950s. To input the Chinese characters is almost as easy as to input English. In Hong Kong, however, a different and more difficult system is used. According to our survey data, among the participants who have never used the SMS, 30% in Hong Kong claimed that they don't know how to input the text, while no participants in Beijing claimed the same reason. Understandably, it is perceived to be relatively easier in China than in Hong Kong to learn how to use the SMS service. Figure 9 shows the response to the question "SMS is easy to use" in Beijing and Hong Kong.

Source: Survey data

Figure 9. Response to "SMS is easy to use"

5. Conclusion

The explosive growth of the SMS service in China and the relatively sluggish response to the SMS in Hong Kong revealed that the emergence and development of a new telecommunications service is subject to many external factors. In the case of the SMS, the user acceptance is subject to the following factors:

First, the economic development level of the region matters. A well developed and sophisticated information infrastructure (like the Internet) in a developed region will offer the public diversified choices. In contrast, subscribers in a region with less developed information infrastructure are vulnerable to limited choices and have to fully explore the value of the limited communication medium that they can access to. The mobile service is therefore perceived to be more useful for subscribers in China than in Hong Kong, as it is not only a means for voice service but also an effective means for data communications in view of the low penetration rate of wireline Internet in China.

Second, the degree of market competition matters. A highly competitive market will provide advanced means of communication (such as mobile voice service) at a cost effective price, while the new but not necessarily advanced service (such as the SMS) will just play a supplementary role. In a non-competitive market such as present in China, however, users are forced to use the cheaper but not necessarily the more advanced means for communication in order to save money. In other words, the SMS is perceived as a much useful means for cost-effective communications in China.

Third, cultural differences play a very important role. As the case of SMS vs. voicemail demonstrates, the differences in culture may lead to different usage patterns for a specific service. The SMS has effectively enabled subscribers in China to overcome their uncomfortableness of leaving voice messages on answering machines or voicemail boxes. In Hong Kong, however, the voicemail service has become the preferred service for leaving a message if the called party is not available. Due to this cultural difference in using voicemail, users in China tend to perceive the usefulness of the SMS more highly than users in Hong Kong.

Fourth, the business model matters. In China, the Monternet program of China Mobile has facilitated the achievement of positive feedback by setting up an effective and mutually beneficial value web with individual content providers. In Hong Kong, the relatively closed value chain for content provision has failed to generate value for users in terms of information richness of the SMS. In this case, the SMS is perceived to be more useful by users in China than in Hong Kong in terms of the diversity and richness of SMS messages offered by content providers.

Fifth, political censorship matters. A society where public media is tightly regulated is favorable towards SMS acceptance. This is because it is more difficult to conduct censorship in the SMS service than in other kinds of media, and the SMS has henceforth been perceived as a useful channel by users in China for accessing and sharing political sensitive information and adult

contents. In Hong Kong, the SMS has no such specific usefulness due to the availability of a broad range of choices in the uncensored public media.

The political censorship also has implications for impacting subjective norms. According to the TRA, a person's subjective norms are partially determined by his or her normative beliefs, i.e., perceived expectations of specific referent individuals or groups. Usually, the referents are those who have a close relationship with or have significant influence upon them. Within the specific context of the SMS, if more people who may be the referents are adopting the SMS, then the person will tend to have more positive subjective norms towards adopting the SMS. According to users interviewed in China, it is common for people to forward SMS messages containing jokes and sensitive news to their friends, because these message are not available in the public media. In Hong Kong, message sharing is not as necessary as in China due to the wide availability of such information in the public media. Therefore, the level of subjective norms towards SMS acceptance is stronger in China than in Hong Kong.

Finally, the input language matters. The simplicity of inputting Chinese with the help of Pinyin as well as the popularity of Pinyin in China have effectively enhanced the user's perceived ease of use in China. In Hong Kong, as the survey has indicated, the more complex method of inputting Chinese characters has acted as a barrier to users sending short messages.

In conclusion, the above analysis indicates that the differences in external factors, such as economic development level, market competition, cultural differences, political censorship, business models, and input language, have led to the discrepancy of users' perceived usefulness, perceived ease of use, and subjective norms towards the SMS, resulting in the different SMS acceptance patterns between Hong Kong and China (Figure 10). Besides explaining the different patterns of SMS acceptance in different regions, this study also contributes a streamlined acceptance model which can be used as a theoretical framework to analyze the introduction of other mobile communication services into different regions. By applying this framework, mobile operators and mobile data service providers can develop an effective region-specific strategy to promote wireless data services in a particular environment.

Figure 10. External Factors in Streamlined SMS Acceptance Model

In order to formulate a successful business strategy for a specific service in a specific market, a mobile operator has to conduct a comprehensive study and identify the key external factors that will affect the perceived usefulness, perceived ease of use, and subjective norms towards acceptance of that particular service in a specific market. An understanding of these issues can also help the operator to assess the level of risk in providing a specific service in a specific region. For example, when the Chinese government tightened its control on SMS and instituted censorship in early 2004, the SMS-related revenues of Netease – one of the most popular Internet portals in China – immediately dropped by 37.1% in the second quarter of 2004 (Ming Pao, 2004). Only after taking all these external factors into consideration, can telecommunications operators design an effective region-specific strategy for specific services.

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