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2Drivers and Moderators of Consumer Behaviour in the Multiple Use of Mobile Phone

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Abstract

The emergence of m-commerce and mobile data service (MDS) attract much of the attentions in the field of m-business. Salient studies have mainly identified the critical factors that drive consumer intentions to adopt a new mobile technology or a cluster of mobile services. While various technologies and services are embedded into one consumer device, existing models have limitations in explicating how consumers respond to the phenomenon of convergent technologies and services and cannot be used to understand consumer usage or future demand. Therefore, this research aims at not only expanding the research contexts from m-commerce but also encompasses the uses of convergent technologies and services on mobile phones. An empirical model is verified through a survey of 249 general mobile phone users in Australia. Findings indicate that perceived enjoyment rather than perceived usefulness and ease of use has a greater impact on consumers' decisions to use mobile phones for personal information management, entertainment and e-mail communication. Perceived risk is the major consideration for consumers using mobile phones for commercial transactions. Gender and PC ownership are identified as two important factors that moderate the mobile phone use for the four different purposes. The findings are expected to contribute to the understanding of using convergent technologies and services from a consumer perspective.

Keywords

Technology Acceptance Model (TAM); technology convergence; mobile phone; Consumer Behaviour

INTRODUCTION

Although penetration of the mobile phone is extremely high in Australia, the extent of consumer usage is still constrained to voice and text communication (Oh et al. 2008). Despite the fact that there has been a proliferation of diverse consumer devices and mobile services developed by service providers, consumer demand has still fallen behind market expectation (Cellular-News 2006). Hence, empirical researchers have developed a variety of models to explore the unique factors that would influence consumer perceptions and motivations to adopt new mobile technologies or a array of services. However, as technologies and services evolve, the existing models are unable to explicitly describe how consumers use mobile phones for multiple purposes and therefore cannot identify the influential factors that drive consumers to use mobile phones as convergent devices.

To reinforce the existing acknowledgement from using a mobile phone for voice talk, this research uses an empirical model based on the constructs subtracted from existing literature and personal interviews (Chang 2007). According to the available features and services in the consumer market, four key consumer purposes can be observed: personal information management (PIM), entertainment, e-mail communication, and commercial transactions. Factors influencing mobile phone uses for these different purposes can be reviewed from the existing constructs in the domain of technology adoption and can be derived from the consumer experiences of mobile phone interactions.

This research is organised by firstly introducing the impact of convergent technologies and services on the perspective of consumer behaviours and identifying the research gaps from the reviewing literature. Secondly, the empirical model is illustrated based on related literature and personal interviews, and the phenomenon of using a mobile phone as a converged device is thus conceptualised. Lastly, this model is verified through the conduct of a consumer survey and a series of statistical analyses. It is anticipated that the findings and discussions will open a new door for future researchers and marketers to pertain a better understanding of technology uses in the contexts of convergence.

LITERATURE REVIEW

Many researchers regard the phenomenon of convergence as different technologies from the domain of information, communication, entertainment and consumer electronics would be ultimately emerged (Fransman

2000; Mueller 1999; Stieglitz 2003; Yoffie 1997). Researchers expect the proliferation of technology innovations would further propel the extent of technology features and services to integrate and embedded in different consumer devices, such as mobile phone, personal digital assistant (PDA), and TV. As noted by Rangone and Turconi (2003), they consider the consequences of technology convergence as “*affecting the access terminals consists of the integration into one device of a set of features previously performed by several devices and represent information sources coming from diverse transport media through a single device (p. 49).*” While it is still uncertain how consumers perceive the changes from convergence and reflect this phenomenon on their current behaviours and future demand. Salient assumptions were made based on the proposition of product/service convergence but those assumptions are seldom put into theoretical justification or in systematic analysis retrieve the feedbacks from consumers. On the other hand, researchers regard the understanding of consumer usage and future demand are pivotal to the success of convergence (Fransman 2000; Tarjanne 2000; Yoffie 1997).

Meanwhile, researchers have not yet recognised the adoptions of different technologies and services would necessarily facilitate the uses of converging technologies and services. In the domain of IT/IS, the diversification of technology features, applications, and services are connected with the adoptions of multimedia, mobile internet, and m-commerce but they are not specified in the ways that clarify how consumers deal with the converging technologies and services (Chae and Kim 2003; Pagani 2004; Shin 2007; Vrechopoulos et al. 2003). The research gaps exist within the adoption and uses of converging technologies and services and can be illustrated as follow:

Interaction between Device Adoption and Service Usage

Researchers are often dichotomised by taking either device-oriented or service-oriented approach to conduct their studies based on issue of technology adoption. However, the interrelationship between device adoption and service usage is a critical issue and implicitly explored (Sarker and Wells 2003).

Empirical studies are inclined to draw the factors from the proposition of value rather than drawing value from individual’s perceptions and motivations. As Sarker and Wells (2003) argued, empirical research lacks of “*clear understanding of the motivation and circumstances surrounding mobile device use and adoption from the perspective of the consumer themselves. (p. 35)*” Based on this assumption, researchers also argue the studies of technology adoption should shed the light on the dynamics of usage behaviours which may beyond the issues of technology adoption (Shih and Venkatesh 2004).

In fact, the uses of mobile phone have been highly penetrated into our daily life. However, from the evaluation of current studies on technology adoption, research gaps exist when different technology products and services are inevitably emerged to convergence but it is still uncertain whether consumers would perceive the changes and reflect this phenomenon based on their usage behaviours.

Lacks of Clear Definition of Converging Technologies and Services

Due to the complexity of converging technologies and multimedia environment, the meaning of converged device has never been well defined. Some researchers attribute to the device convergence as the concept of “universal device” which means a converged device is all-in –one and access to information anywhere (Katz 1996; Rangone and Turconi 2003). Other researchers consider the adoption of different technology innovations and services in a combination can be considered as different streams of technology adoption, such as the adoption of mobile Internet (Chae and Kim 2003; Kim, H. and Kim 2003; Kim, H. et al. 2002; Pedersen 2005; Pedersen and Ling 2002; Shin 2007), the adoption of WAP-enabled phone and services (Barnes 2002; Hung, Ku and Chang 2003; Shchiglik, Barnes and Scornavacca 2004; Teo and Pok 2003), and the adoption of wireless Internet via mobile technology (WIMT) (Fang et al. 2006; Lu, Yao and Yu 2005). As different technologies and services are evolved and emerged, empirical studies may share the same contributions to the reasons of adopting different converging technologies and services but they are unable to explicate how consumers deal with converging technologies and services simultaneously on their mobile phones.

Salient studies on the premise of technology adoptions are often concluded their findings at the point of adoption rather than exploring how people deal with certain technology in width and depth (Shih and Venkatesh 2004). More research is anticipated to focus on the use behaviours which is assumed to be more meaningful than the initial adoption (Anderson and Ortinau 1988; Shih and Venkatesh 2004).

Instead of identifying the influential factors that cause people to adopt any particular new technology, this research intends to explore the constructs from the convergence among various technologies, devices, and services. The operational definition of converged device, potential factors, and validation of empirical models will be illustrated in the following sequence.

THE DEFINITION OF USING MOBILE PHONE AS A CONVERGED DEVICE

Referring to the technology and services available to the general mobile phone users, several researchers attempted to explore the existing mobile applications and services and categories the extant of uses into different segments (Table 1).

Table 1. Segmentation of Mobile Data Services

Author	Service Segmentation
Anckar and D’Incau (2002)	18 services are grouped into 5 categories, such as time-critical needs, spontaneous needs, entertainment needs, efficiency needs, and mobility-related needs.
Mahatanankoon et al. (2005)	content delivery, transaction-based, location-based, emergency assistant and entertainment
Hysveen et al. (2005)	Text messaging, contact, gaming, and payment
Carlsson et al. (2005)	Information, reservation and purchase, entertainment, and communication
Fang et al. (2006)	General, transaction, and gaming tasks
Bina, Karaisko and Giaglis (2008)	m-commerce, communication, information, and entertainment services
Oh et al. (2008)	Commerce, communication, information contents, and entertainment contents

Acknowledged the shortcoming of empirical studies on the proposition of device and service adoption, this research attempts to operationalise the uses of mobile phone as a converged device. In fact, the adoption of mobile phone and the uses of different mobile services have been widely explored in terms of device adoption (Kim, S. 2003; Kwon and Chidambaram 2000; Teo and Pok 2003), uses of mobile data services (Anckar and D’Incau 2002; Bina, Karaiskos and Giaglis 2008; Lu, Yao and Yu 2005; Mahatanankoon, Wen and Lim 2005; Nysveen, Pedersen and Thorbjornsen 2005; Shchiglik, Barnes and Scornavacca 2004), or a combination of both (Carlsson et al. 2006; Sarker and Wells 2003).

EMPIRICAL CONSTRUCTS OF TECHNOLOGY ADOPTION

The constructs of technology adoption in IT/IS are mostly derived from the theories of social psychology and are perceived as effectively in explaining and predicting the changes of human behaviour. Among all the theories and models, technology acceptance model (TAM hereafter) is the most notable among the others as salient researchers apply the original framework and develop their empirical models (Davis 1989).

In this research, two constructs, perceived usefulness (PU) and perceived ease of use (PEOU) are retrieved from TAM (Davis 1989, 1993; Davis, Bagozzi and Warshaw 1989, 1992). Based on the motivation theory, the two constructs are assumed to be discrete from each other in which perceived usefulness is derived from extrinsic motivation and perceived ease of use is attributed to intrinsic motivation (Davis, Bagozzi and Warshaw 1992). In addition, two additional constructs, perceived enjoyment and perceived risk, are also considered as critical factors on technology adoption.

Perceived enjoyment (PE) is assumed to derive from intrinsic motivation in which people feel enjoyable on their own right from the technology interaction (Davis, Bagozzi and Warshaw 1992). The effect of enjoyment is assumed to be equally effective on influencing consumer intentions. This construct is also supported by the extrapolating from the aspects of fun and playfulness during the technology interactions (Webster and Martocchio 1992; Webster, Trevino and Ryan 1993). In contrast, perceived risk (PRISK) is defined as “*the uncertainty that consumers face when they cannot foresee the consequences of their purchase decisions.* (Chan and Lu 2004)” This construct of perceived risk is also supported by several researchers in their studies of human computer interactions (Igbaria 1994; Pavlou 2001; Tan and Teo 2000).

Four indicators, PU, PEOU, PE and PRISK, are used to specify individuals’ multiple perceptions of using mobile phone as a converged device. Other potential factors, such as individual’s predetermined choices of phone handset, service plan and demographic information are assumed to moderate consumer intentions toward conducting specific behaviours, are thus included in the empirical model.

Furthermore, the influences of complementary and competing technologies would case different level of influences on the technology adoption have been proposed by several researchers (Gatignon and Robertson 1985; Karahanna, Straub and Chervany 1999; Shih and Venkatesh 2004). Several communication researchers also applied the ownership of PC and the ownership of other technology products as factors that influence technology adoption (Dupagne 1999; Kim, S. 2003; Lin 2004). However, this construct has not been verified in the use contexts of mobile phone and should be worth of further exploration.

In summary, a measurement model is developed by drawing the relationship between the empirical constructs and behavioural measures together (Figure 1).

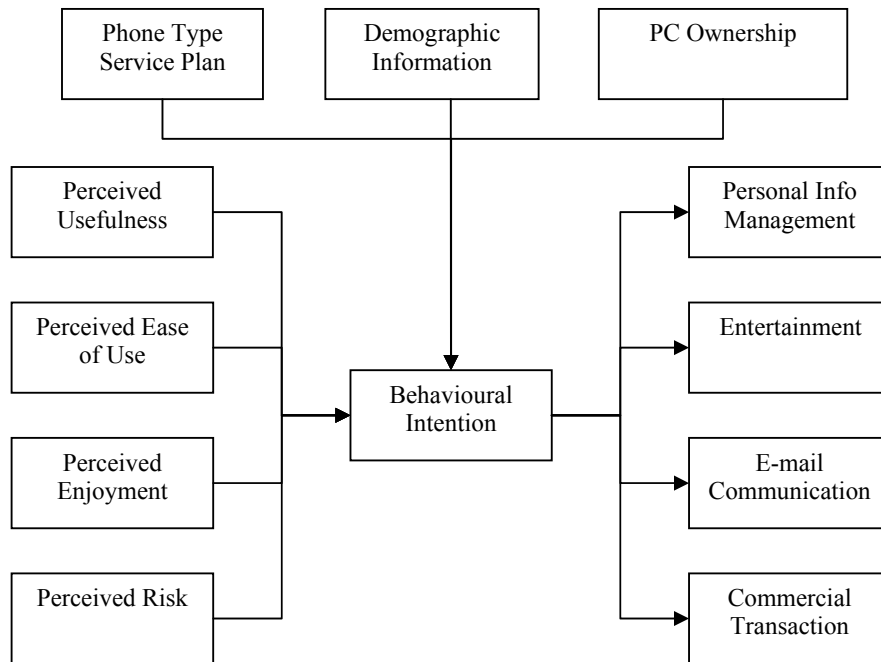


Figure 1: Research Model

RESEARCH INSTRUMENT

For the test of content (face) validity, questions are drawn by the frequency of questions used in the literatures. Nomological validity is of no concern as the constructs and their relationship in this model have been verified in prior research in advance. Legris, Ingham and Collette (2003) provided a summary of the questions on the perceptions of usefulness (PU) and ease of use (PEOU) in their meta-analysis. Seven items are adapted from PU and four items are adapted from PEOU. Four items are included in the measurement of perceived enjoyment by asking respondents about their perceptions of using mobile phone as interesting, fun, pleasurable, and exciting. Four items of measuring perceived risk are adapted from the questions in the study by Chan and Lu (2004) as they attributed perceived risk as a valid construct to explain consumers' intention to use online banking. Each construct is measured by 7-point Likert scale.

As summarised from prior research (Table 1), different usage patterns can be observed from four different purposes, such as using mobile phones for personal information management (PIM), entertainment, e-mail communication, and commercial transactions. This segmentation can be further operationalised from the subgroups of behaviours under each category as consumers can freely manipulate various features or choose to receiving services from different providers on their mobile phones. A total of 11 behaviours are thus defined, such as listening to mp3 music, checking daily schedule, paying bills, and so on. For each type of behaviour, respondents can evaluate and choose from their current status in a 3-point scale (i.e. never use, intention to use, and use it now). In addition, individual's choices of phone type, service plan, the ownership of PC and the numbers of other portable devices and personal demographic information are also adapted into the research instrument.

CONSUMER SAMPLE AND DATA COLLECTION

Consumer data are collected through an online survey in a three-month period from September to December in 2007. According to a survey released by IBISworld in 2007, the majority of mobile users in Australia are aged between 18 to 49 years old. Therefore, the sample population in this study is targeted at young university students. Snow ball sampling is chosen as the main sample method. Respondents are encouraged to disseminate the invitation through e-mail or face to face to other people and ask them if they can participate in this research. Meanwhile, posters are sent to computer labs and library as an easy way to attract students to access to Internet. A latest mobile phone is provided as incentive to attract more respondents.

DATA SCREENING AND DESCRIPTIVE ANALYSIS

A total of 249 respondents complete the survey and response rate is around 25%. After dropping 13 cases due to the violations of univariate and multivariate outliers, the valid sample size is 236. From the results of descriptive analysis, the majority of respondents are aged from 18 to 25 years old (62%). Most of them are students from local universities. The majority of students are undergraduate and postgraduate students (69.1%). Male respondents are over two times of female respondents (71.6% vs. 28.4%). Most of them use advanced mobile handset (42.4%) and choose prepaid services from their service providers (47%).

Age is regarded as an important factor in the adoption of mobile technologies (Oh et al. 2008). Empirical researchers conclude the young generation is likely to become the pioneer to the adoption of mobile data services. In this study, different age groups are directly contrasted with their choices of mobile handset and subscribed service plan. The results from cross-tabulation indicate young generation has significant differences on their choices of mobile handset than old generation (e.g. for the age groups from 18 to 30 years old, 90.1% in the advanced phone adoption and 85.5% in the multifunctional phone adoption). However, due to the high cost of service charge, most young consumers are constrained to the voice usage (e.g. for the age groups from 18 to 30 years old, 84.5% in the prepaid service plan and 76.7% in the cap voice plan). In summary, the results imply if service providers in Australia want to attract more service usage from young generation, they not only have to persuade young people to subscribe to a higher service plan but also need to realise the actual value which is behind the device adoption.

Construct Reliability and Validity

This research is a preliminary study by using four valid constructs from the literature and attempted to draw the causal relationship that explains the individual uses of mobile phone for the purposes of personal information management (PIM), entertainment, e-mail communication, and commercial transactions. Therefore, four separate data sets are created to test the model in four runs.

Before the survey, the items used in the instrument are adapted from the supportive literature. It is also validated through a pre-test procedure with 25 respondents to ensure the fulfilment of content validity. The test of Cronbach's alpha is adopted for evaluating the construct reliability. The result of construct reliability on 39 attitudinal items is .942, which is well acceptable for over .70 criterion (Nunnally 1978). In order to discover the number of factor, 39 items are first tested by principle component analysis (PCA) and six factors are identified and altogether they explain 73.71% of the variances.

For testing the same constructs on four different models, the data sets are separated as the model of PIM, entertainment, e-mail and commercial transactions. For item validity within each model, common factor analysis is performed by using maximum likelihood extraction with oblique rotation (i.e. direct oblimin) to make sure no single item is cross loaded onto different factors. The cut-off value for factor loadings is set at .50 for empirical items (Hair et al. 2006). After checking with the results from factor analysis, summated scales are created by averaging the items into a composite variable for further analyses. From the results of factor analysis, it is surprisingly that respondents do not differentiate the constructs between perceived usefulness and ease of use. Therefore, the items from both constructs can be composite into single factor. All the measurement items are loaded to three discrete factors, such as perceived usefulness, ease of use (PU&PEOU), perceived enjoyment (PE) and perceived risk (PRISK). The construct validity is satisfied by checking the items with high loadings within each factor and low in cross-loadings with other factors. In addition, the correlation among the independent variables is low which means three indicators are distinct constructs.

Results of Model Testing

Multiple regression analysis is chosen to test the empirical model as both independent and dependent variables are continuous data. Four distinct models are used to specify the critical factors that affect consumers to use mobile phone for PIM, entertainment, e-mail communication, and commercial transactions. Therefore, the original dataset is separated into four subsets and explored only on the relevant items. Data normality, linearity, multicollinearity, and outliers can be checked by using SPSS version 16. The criterion for data normality is performed by using descriptive analysis and is found of less concern from the distribution of skewness and kurtosis in an acceptable range (e.g. std. deviation $\leq \pm 1.96$) (Hair et al. 2006). Other tests for data screening are employed in the multiple regressions. The statistical output of the four models are illustrated as follows:

Using Mobile Phone for Personal Information Management (PIM)

The results from regression analysis indicate perceived enjoyment is the most effective factor ($\beta=.336$, $p<0.001$) than the combination effects of perceived usefulness and perceived ease of use ($\beta=.216$, $p<0.001$). Perceived risk is not a significant indicator in this model (Table 2). 24.2% of variances are explained this three indicators.

Using Mobile Phone for Entertainment (ENT)

Similar results can be obtained from the uses of mobile phone for entertainment as perceived enjoyment has a stronger predicting power than perceived usefulness and ease of use (PE, $\beta=.363$, $p<0.001$ versus PU_PEOU, $\beta=.259$, $p<0.001$). Perceived risk is still a weak predictor for entertainment purpose (**Table 2**).

Using Mobile Phone for E-mail Communication (EMAIL)

Compared to the use of mobile phone for entertainment, perceived enjoyment is still a strong indicator and its regression weight is even higher than its effect in the uses of mobile phone for entertainment. It is contradictory to the initial settings as perceived enjoyment should be performed better in the uses of mobile phone for entertainment. It implies the requirement of attention as perceived enjoyment is a critical indicator in using mobile phone for e-mail communication as well (**Table 2**). 28.4% of variances explained by these three indicators.

Using Mobile Phone for Commercial Transactions (COMM)

The results from the uses of mobile phone for commercial-related activities are different from the previous three. The influences from perceived usefulness, ease of use, and enjoyment are diminished as the effects of perceived risk are increased (Table 2). It is reasonable to comprehend the factor of risk as the priority when people need to make decisions about conducting online transactions through mobile phone. This result further confirms to the hypothesis and supported by salient literature with regard to mobile payment and commerce.

In summary, it can be concluded that perceived enjoyment overwhelmed the other two indicators when people consider using a mobile phone for PIM, entertainment, and e-mail communication. However, perceived risk becomes the most influential factor when they evaluate the mobile usage for banking or shopping purposes.

Table 2. Regression Coefficients of PU_PEOU, PE, and PRISK in the Four Measurement Models

Model	Variable	Standardised coefficients			Collinearity statistics	
		Beta	t	Sig.	Tolerance	VIF
PIM	(Constant)	--	3.687	0.000	--	--
	PU_PEOU	0.216	3.114	0.002**	0.851	1.174
	PE	0.336	5.092	0.000***	0.942	1.061
	PRISK	-0.103	-1.899	0.059**	0.877	1.14
Entertainment	(Constant)		-0.879	0.381		
	PU_PEOU	0.259	3.793	0.000***	0.801	1.248
	PE	0.363	5.520	0.000***	0.867	1.154
	PRISK	-0.088	-1.355	0.177	0.897	1.114
E-mail Communication	(Constant)		-1.285	0.201		
	PU_PEOU	0.220	3.289	0.001**	0.888	1.126
	PE	0.401	5.83	0.000***	0.841	1.19
	PRISK	-0.072	-1.015	0.312	0.786	1.273
Commercial Transaction	(Constant)		1.303	0.194		
	PU_PEOU	0.148	2.137	0.034*	0.911	1.097
	PE	0.196	2.654	0.009**	0.8	1.25
	PRISK	-0.314	-4.101	0.000***	0.744	1.344

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Worth noting, the variances explained by these three indicators are around 25% to 30% in average across all four models. The low explained variances has been criticised by some researchers as the drawback of TAM (Lee, Kozar and Larsen 2003). However, as consumers' experiences and technology usage are becoming diverse and heterogeneous, it is even more difficult to examine the multiple utilisations of converging technologies and services in a general discipline.

Moderating Effects: Gender, Individual Ownership of PC and Other Portable Devices

In addition to the issue of age, gender is another factor that is proved to case impact on the technology adoption (Agarwal and Prasad 1999; Gefen and Straub 1997; Gilbert and Han 2005).

From the regression results in the model of PIM, both PU_PEOU and PE have significant predict the uses of mobile phone in male group and none of the constructs are significant in female group. Hence, it is implied that male respondents are prone to use mobile phones for PIM than female respondents. In contrast, in the model of entertainment, female respondents appreciate the utilitarian value of using mobile phones for entertainment purpose ($\beta=.047$ in female group vs. $\beta=.167$ in male group, $p<.005$). Male respondents on the other hand focus on the hedonic value than their counterpart ($\beta=.393$, $p<.001$).

As noted in the model of e-mail communication, male respondents are perceived much enjoyment on the uses of mobile phone for e-mail purpose than female ($\beta=.524$, $p<.000$). However, this can be explained by the fact that female respondents perceive more risk on conducting e-mail through their mobile phones ($\beta=-.340$, $p<.05$). Lastly, the results from the model of commercial transactions, male and female respondents perceive this use purpose in a different ways. Male users are more inclined to perceive much enjoyment and female users tend to perceive utilitarian value when they consider to using mobile phone for commercial transactions (PE, $\beta=.272$ and $p<.005$ in male group, and PU_PEOU, $\beta=.396$, $p<.01$ in female group)(**Table 3**)

Table 3. Regression Coefficients of PU_PEOU, PE, and PRISK between Male and Female in Four Measurement Models

		Male		Female	
		Beta	Sig.	Beta	Sig.
PIM	PU_PEOU	0.208	0.008**	0.258	0.118
	PE	0.392	0.000***	0.172	0.250
	PRISK	-0.126	0.103	-0.108	0.483
Entertainment	PU_PEOU	0.167	0.038*	0.470	0.002***
	PE	0.393	0.000***	0.272	0.048*
	PRISK	-0.072	0.356	-0.011	0.926
E-mail Communication	PU_PEOU	0.182	0.015*	0.276	0.061
	PE	0.524	0.000***	0.006	0.969
	PRISK	0.010	0.897	-0.340	0.036*
Commercial Transactions	PU_PEOU	0.070	0.371	0.396	0.009**
	PE	0.272	0.002**	0.025	0.868
	PRISK	-0.293	0.001**	-0.246	0.128

* $p<.05$, ** $p<.01$, *** $p<.001$

The factor of PC ownership and the competing technologies have been proposed by several researchers that would either facilitate or constrain the rate of technology use (Gatignon and Robertson 1985; Shih and Venkatesh 2004). From the findings of personal interview, the most referable answer from interviewee to not using mobile phone for a particular function or purpose is they use PC to do the job (Chang 2007). Empirical researchers also propose the value of PC synchronisation as an incentive that consumers might want to use their mobile phones as an intermediate to carry and store their personal information (Constantiou, Damsgaard and Knutsen 2006; Pagani 2004).

In addition, the proliferation of consumer devices can also create distraction to consumers to adopt mobile phones for performing the same functions or services as other consumer devices. These two constructs have seldom been explored in the extensive studies of mobile technology adoption. Kim (2003) explicates the factor of functional equivalence that would influence consumers' decision to choose new product among other alternatives. This scenario is also expected to be the consequences of technology convergence as different products and services are integrated into an all-in-one device. However, researchers still cast doubt on the success of device convergence from the perspective of device adoption (Jenkins 2001; Robbins 2003).

With regard to the PC ownership and the ownership of other portable devices as the moderators to the influences of using of mobile phone for four different purposes, the model can be drawn as a comparison to the original model and observe from the changes among four models.

In the model of PIM, consumers perceive more importance on the aspects of usefulness and ease of use when they actually own a PC. Similar results can be obtained in the model of entertainment. It is also implied that an individual who does not own a PC might perceive more enjoyment than people who own a PC.

In contrast, for the usage of service orientation, such as using mobile phone for e-mail and commercial transactions, consumers who have PC perceive high level of usefulness, ease of use and enjoyment when they consider to using e-mail and online transactions on the mobile phones (**Table 4**).

Table 4. Regression Coefficients of PC Ownership in Four Measurement Models

		Not PC Owner		PC Owner	
		Beta	Sig.	Beta	Sig.
PIM	PU_PEOU	0.113	0.368	0.278	0.002**
	PE	0.321	0.005**	0.326	0.000***
	PRISK	-0.129	0.307	-0.150	0.072
Entertainment	PU_PEOU	0.068	0.542	0.398	0.000***
	PE	0.499	0.000***	0.243	0.006**
	PRISK	-0.148	0.180	-0.071	0.375
E-mail Communication	PU_PEOU	0.184	0.173	0.211	0.008**
	PE	0.235	0.077	0.481	0.000***
	PRISK	-0.007	0.962	-0.129	0.111
Commercial Transactions	PU_PEOU	0.081	0.545	0.144	0.096
	PE	0.104	0.451	0.228	0.016*
	PRISK	-0.311	0.043*	-0.335	0.000***

*p<0.05, **p<0.01, ***p<0.001

DISCUSSION AND CONCLUSION

Perceived usefulness and ease of use have been discussed and applied to the business environment for over two decades. However, the two constructs cannot fully explain the extent of technology usage and often suffer the problems of low variances and limited contexts (Lee, Y., Kozar and Larsen 2003; Legris, Ingham and Colletette 2003; Venkatesh, Speier and Morris 2002).

From the results of factor analysis, it is surprisingly found that respondents do not differentiate the constructs between usefulness and ease of use. This finding is apparently contradictory to the empirical conclusions that the two constructs are presumed to be distinctive, and they are correlated with each other in most of the TAM studies. The possible explanation is that this research is conducted during different phases of device adoption and service usage. As noted, researchers have concluded that TAM is more effective during the initial stage of technology adoption (Szajna 1996). While it can also be assumed that perceived usefulness and ease of use are more effectively in exploring utilitarian value from technology adoption (Davis, Bagozzi and Warshaw 1992). Hence, respondents at this stage may have gone through the use of mobile phones for communication and desire for new features and services might respectively diminish appreciation for instrumental uses. Further explanations can be expected in future research.

Perceived enjoyment (PE) has the most significant influence on consumer use of mobile phones across the four different purposes. Davis and his colleagues (1992) have been acknowledged the hedonic aspect of enjoyment on technology adoption. Similar to the constructs of perceived playfulness in flow theory, the effect of perceived enjoyment is effective for voluntary use within the technology interactions (Lee, T. and Jun 2005; Webster and Martocchio 1992). It is also as expected that perceived risk dominates the constructs when people consider using mobile phones for commercial transactions. In this situation, the consumer perceptions of usefulness, ease of use and enjoyment are almost equal.

Due to the fact that the sample was limited to TAFE and higher education students, moderating effects of age, occupation and education are absent. Gender proved to be a critical factor that significant differentiates the magnitude of perception when male and female users consider using mobile phone for different purposes. Researchers and marketers can learn from this implication when they consider the heterogeneity of product designs and service marketing.

This research uses PC ownership as a preliminary construct and tests its influence on technology uses. Surprisingly, the result is not consistent with the findings in the personal interviews. Consumers who own PC perceive that they have a much higher level of mobile phone uses across different purposes than their counterparts. This notion is confirmed with the findings by some diffusion researchers that imply PC owners also use more and varied technology products (Dickerson and Gentry 1983; Lin and Jeffres 1998).

Due to the lack of consumer research in the domain of convergence, this research is an exploratory study that attempts to clarify the interrelationship between convergent technologies and heterogeneous consumer behaviours in Australia. More research is expected to clarify the effects of perceived usefulness and ease of use when consumers respond to the changes by convergence. Researchers might also consider using constructs from

other theoretical frameworks and test in the domain of convergent technologies and services. By doing so, it is anticipated to pertain a deep understanding of the interactions between technology convergence and consumer behaviour in the future.

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