

Understanding Consumers' Expectations of Mobile Data Services in Australia

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Abstract

The Australian Mobile Telecommunication Industry has experienced a significant growth in the last few years. However, mobile data services which have the potential to increase the industry revenue significantly have not been used widely as predicted. At this stage, few studies have been conducted to explore the use of mobile data services in Australia. To better understand mobile phone users' expectations regarding mobile data services, this study explores the current use of mobile data services in Australia through a survey study. The findings indicate that there has been a positive trend towards a wider use of mobile data services in Australia. Price, usefulness and immediate availability of the services have been identified as important factors that can further encourage the use of mobile data services in Australia.

1. Introduction

In recent years, the telecommunications sector in Australia, particularly the mobile industry, has grown significantly with a very high mobile phone penetration rate [1]. Australian's mobile phone penetration rate at December 2004 was ranked twentieth worldwide and fourth in the Asia-Pacific region [2, 18]. This penetration rate was forecasted to exceed 95 per cent in 2006 [3]. Seven terrestrial networks including Global Systems for Mobile Communication (GSM), Code Division Multiple Access (CDMA) and Wideband Code Division Multiple Access (WCDMA) are serving the market, although the application of WCDMA, known as the 3rd Generation mobile technology (3G), is rather limited [3, 4]. The Australian mobile phone industry is moving towards the 3G

products and services. It is estimated that 3G users will comprise one-third of the market and revenue from non-voice applications, which are commonly known as mobile data services, will constitute almost 30 per cent of total revenue by 2009 [1].

The Australian mobile market is considered complex due to its specific characteristics [4]. The geographic size of the continent, continued government control on Telstra as the major player in the Australian market and an unstable regulatory situation have created a challenging environment for competitive entry [4]. For example, compared to many countries in the Asia-Pacific region, such as China and Japan, Australia has a large territory with relatively small density of the population. The current population is concentrated mainly in the coastal cities including five state capital cities. Consequently, there is an advanced, high quality mobile infrastructure serving the city business districts of the state capitals and major towns, but poor coverage in rural and regional Australia [5, 2]. This affects the use of mobile voice calls and mobile data services in Australia.

Because of the importance of mobile telecommunication for the economic growth in Australia and the fact that the mobile data services offered are currently growing rapidly due to the advances in mobile network technologies in Australia [1, 2], it is crucial to understand mobile phone users' expectations of mobile data services in Australia. At the moment, there are still very limited studies on mobile data services in Australia, while there have been relatively more such studies conducted in other countries, particularly in Asian and European countries due to the early and rapid deployment of mobile data services [6-10]. Therefore, this study explores the use of mobile data services in Australia in order to better

understand consumers' expectations of the services. Specifically, the aims of this study are: 1) to understand how mobile data services are used in Australia and 2) to identify some factors that would motivate the use of mobile data services in Australia. For the purpose of this study, a survey was conducted in Australia in 2006 as part of the Worldwide Mobile Internet Survey (WMIS) project. WMIS is a consortium of Universities and industry participants around the world that was established in 2002 at the first Global Mobility Roundtable meeting in Tokyo. It explores the use of mobile data services over time in various countries and to conduct multi-national comparisons to understand the consumer behaviour across countries. In this paper, only the relevant findings of the Australian WMIS survey are included to address the aims of this study.

The findings indicate that mobile data services have gained popularity in Australia although the rate of the uptake is still relatively low. Various services including mobile chatting, multimedia messaging, mobile games and mobile shopping, appear to become more recognized in Australia. The price of using mobile data services, the usefulness and availability of the services are some of the important factors that would encourage the use of mobile data services in Australia. Insights obtained from this study can help practitioners to better understand users' expectations of mobile data services and, hence, strategies can be devised so that the popularity of mobile data services in Australia can be increased.

In the next section, a brief literature review on mobile data services in Australia is presented. Then the survey method used in this study is presented, followed by the survey findings. Finally, conclusions are drawn and some future studies are outlined.

2. Mobile Data Service in Australia

The use of mobile data services by Australian consumers continue to expand. SMS has remained the most popular non-voice application for mobile phone users, although consumers are also using other data applications such as accessing mobile internet, exchanging emails and downloading ring tones [2,11]. The growth in SMS usage remained strong. There were 6.736 billion SMS messages sent during 2004–05, compared to 5.078 billion in 2003–04. SMS continues as an important sector of revenue growth [2, 4]. Strong growth in premium SMS and multimedia messaging service (MMS) usage are also reported [2, 3].

With the extra functionality of 2.5G and 3G mobile networks and customer handsets, Australian mobile contents are also growing rapidly [2]. It was estimated that the Australian mobile content market was worth \$129 million in the 2004 calendar year and a high growth is expected over the next five years to achieve \$1 billion annual revenue, driven by entertainment (including the adult services sector), followed by enterprise applications and productivity services (email and instant messaging services) [2].

Australia's four network operators, which include Telstra, Optus, Vodafone and Hutchison, all have specific service offerings focusing on the delivery of content over mobile phones. For example, Telstra's mobile content service uses the i-mode platform developed by NTT DoCoMo, which provides contents such as news, sports, entertainment and games. Under its licence agreement with NTT DoCoMo, Telstra has exclusive rights to market i-mode in Australia for five years, provided that it attracts at least one million customers in the first three years [17]. Through this agreement, Telstra becomes the first telecommunication company in the English-speaking world to deploy the Japanese giant's i-mode, joining E-Plus Mobilfunk GmbH & Co. KG (Germany), KPN Mobile N.V. (Netherlands), Far EastTone Telecommunications (Taiwan), BASE N.V./S.A (Belgium), Bouygues Telecom S.A. (France), Telefonica Moviles Espana (Spain), Wind Telecomunicazioni SpA (Italy) and COSMOTE Mobile Telecommunications S.A (Greece) [12]. It is expected that Telstra could have one million subscribers on the i-mode service by the end of the third year (2007).

By September 2005, the operator had 204 i-Mode sites and over 120 content partners providing range of services including entertainment, information and applications [13]. The services are currently only offered to post-paid subscribers, but are expected to cover pre-paid customers in the future. Compared to other Asia-Pacific market, the pricing for i-mode charged by Telstra is relatively expensive and complex. For example, the average traffic charges by Telstra for casual browsing is \$17.12 per megabit, whereas SingTel and China Mobile charge at \$3.31 and \$3.36, respectively [13]. Although some market researchers, such as Telsyte, predict that Telstra's i-mode is unlikely to achieve the number of subscribers required to meet its exclusivity agreement with NTT DoCoMo [14], Telstra has reported positive take-up figures and claimed that i-mode is growing more popular in Australia because of its extensive content choice,

simplicity of use, and the value it offers customers [15].

i-Mode also provides a platform that supports a range of m-Commerce. M-commerce refers to the use of wireless telecommunications in carrying out commercial transactions [2]. M-commerce examples include paying for car parking and soft drinks and paying for airline and concert ticket reservations. In a study on inhibitors and facilitators in the adoption of mobile payment in Australia [16], evidence shows that mobile payments are still not a commonly accepted method in Australia. Great efforts are still needed to promote the growth of m-commerce in Australia, which will contribute to the increase in revenue from mobile data services use.

3. The Survey Research Method

As part of the WMIS project, an online survey was conducted in Australia in early 2006 through a joint effort between the University Melbourne and m.Net Corporation, a mobile service enabler based in Adelaide. The survey was administered electronically by m.Net Corporation via email and selected web sites. The survey was posted on 20 web sites. Some are magazine sites like Marie Claire (<http://www.marieclaire.com.au/>) and Men's Health (<http://www.menshealthmagazine.com.au/>); others include radio station sites (2DayFM <http://www.2dayfm.com.au/>) and a university site. In addition, the survey was emailed to all members of the Australian Interactive Media Industry Association (AIMIA). The online survey was kept in a research database held by m.Net Corporation. The survey was 'live' from Monday 27 February 2006 to Monday 13 March 2006. After removing incomplete responses, the total of 6116 responses was obtained.

The 2006 version of the WMIS survey was designed by a panel of the participating researchers. In this survey, mobile data services (MDS) refer to an assortment of digital data services that are accessed through a mobile phone (e.g. SMS, e-mail, Multimedia Messaging Service (MMS), news/weather information, ring tone downloads, audio/video clip downloads). We limit the device under study to mobile phones, excluding laptop computers and PDA (e.g. using wireless LAN for mobile access via laptops and PDAs). The questionnaire consists of three sections: use of mobile data services, respondents' views on mobile services and demographic questions.

For Section 1, four types of mobile data services are included:

- commerce: buying goods/tickets, making reservations, bill payment
- communication: e-mail, SMS, MMS, mobile chatting, push-to-talk
- information: news/weather/sports/stock market info, shopping info, schedules, product info, maps, location-based info
- entertainment: downloading games, graphics, cartoons, music, betting, ring tones, adult content

In Section 2, sources to learn about mobile data services, issues that affect respondents' interest in using mobile data services and reasons for using mobile data services are explored. Finally, Section 3 is used to collect details of the respondents, such as gender, age, employment status, and household income. Table 1 summarizes the profile of the survey respondents. The majority of the respondents (80%) are female. The unbalanced proportion of gender is because most of the magazine sites used for the online survey are targeted for women. In terms of age, there is a fairly balanced distribution across ages which are below 50. A very small proportion of the respondents are above 50 years old. In addition, the number of respondents from each state is considered proportional to the actual population density, with New South Wales, Victoria and Queensland as the most three densely populated States, followed by South Australia, Tasmania, ACT and Northern Territory. Furthermore, about 50% of the respondents have a household income between \$25-100K, while 36% are students.

In this paper, a preliminary analysis was conducted to explore the use of mobile data services in Australia. Because of the large sample size and various backgrounds of the participants, the survey findings can be generalized to the entire population despite of the bias in the gender of the respondents. Using statistical techniques such as frequency and means of responses, the study identifies some important sources to learn about mobile data services, patterns of mobile data services use, factors affecting interest in using and main reasons for use, as discussed in the next section.

4. Survey Findings and Discussions

As part of exploring the pattern of mobile data services used, the respondents were asked about the purpose of using mobile data services and the length of use in a week. As shown in Figure 1,

most respondents use mobile data services for personal activities rather than work related activities. Only seventeen percent of the

respondents use mobile data services for both personal and work related activities equally.

Gender		
Female	4873	80
Male	1243	20
Total	6116	100
Age		
	Number	Percentage
below 18 yrs	1552	25
18-24 yrs	1177	19
25-34 yrs	1563	26
35-49 yrs	1420	23
50-65 yrs	375	6
over 65 yrs	29	0
Total	6116	100
State of Residence		
Victoria	1628	27
New South Wales	1847	30
South Australia	587	10
Western Australia	614	10
Queensland	1140	19
ACT	116	2
Tasmania	130	2
Northern Territory	54	1
Total	6116	100
Household income		
under \$24K	958	16
\$25-50K	1455	24
\$51-100K	2086	34
\$101-149K	727	12
\$150K or higher	468	8
Total	6116	100
Employment		
Student	2216	36
Retired	133	2
Full time parent	538	9
Unemployed	163	3
Employed	1646	27
Total	6116	100

Table 1. The Profile of the Respondents

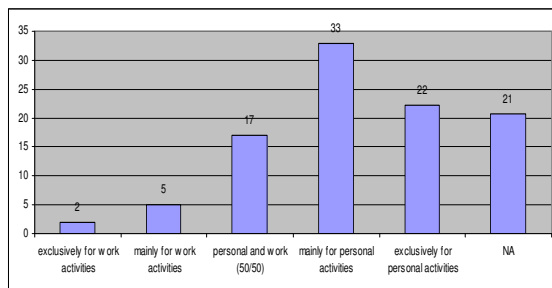


Figure 1. Purpose of Use of Mobile Data Services

Furthermore, among the mobile data service users, most of them only use the services less than 30 minutes per week, as depicted in Figure 2. Only

20% of the respondents use them for 30-60 minutes and 20% use for more than 60 minutes per week. This indicates that mobile data services have not been used heavily in Australia.

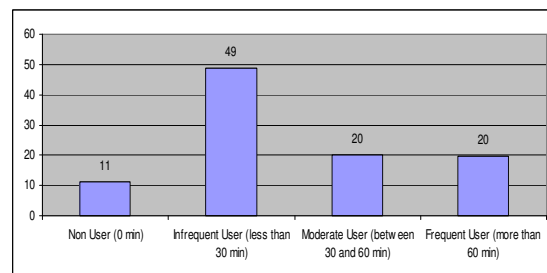


Figure 2. Length of MDS Use in a Week

The use of four types of mobile data services was then examined by asking the respondents to indicate how often they use each service based on a five-point scale: 1-not at all, 2-not often, 3-somewhat often, 4-often and 5-very often. To simplify the analysis, option 3 was recoded to 2, and options 4 and 5 were recoded to 3, yielding 3 categories: 1-not at all, 2-not often and 3-often. Figure 3 depicts the frequency of responses for each category. As shown in Figure 3, respondents mostly use mobile data services for communication purpose. Mobile commerce services which include shopping, reservations, banking and finance are the least used. The analysis shows that there is an emerging interest among the respondents to use mobile data services for accessing information and entertainment contents.

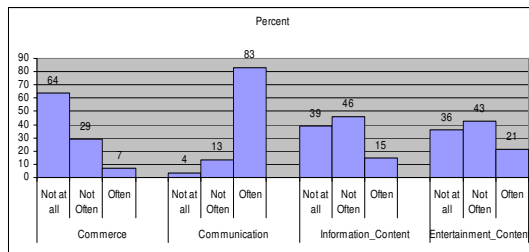


Figure 3. Types of MDS Use

A further analysis of the survey data was performed on the frequency of using a number of mobile communication services for each of the four types. For each service, the respondents were requested to indicate how often they use the service based on a seven-point scale: 1-never, 2-occasionally, 3-one to three times a month, 4-one to two times a week, 5-three to five times a week, 6-daily and 7-several times a day. Table 2 depicts the mean of the responses for some mobile commerce services offered in Australia. Mobile shopping is the most commonly cited, followed by banking, reservation and finance, although overall, the use is still considered very low.

Table 2. Use of Mobile Commerce Services

	Mean	SD
shopping	1.68	1.02
banking	1.67	1.25
reservations	1.45	0.87
finance	1.18	0.68

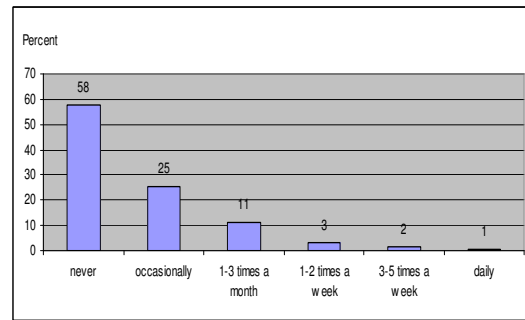


Figure 4. Use of Mobile Shopping Service

Table 3 shows the list of the services for the mobile communication type, sorted by the means of the responses. Consistent with what is reported in the literature, SMS is the mostly used communication service, with 40% of the respondents use it several times a day and 25% use it daily.

Table 3. Use of Mobile Communication Services

	Mean	SD
SMS	5.54	1.72
Mobile Chat	3.33	2.28
MMS	2.34	1.61
email	2.21	1.92
Push to Talk Services	1.61	1.40
Video Calling	1.42	1.07

Mobile chat appears to be the second most popular mobile communication used in Australia with the mean score of 3.33 (see Table 3). A further analysis indicates that 12% use mobile chatting several times a day and 15% use it daily, as shown in Figure 5. The large standard deviation in Table 3 is caused by the fact that a relatively high proportion of the respondents (36%) have never used the service. As indicated in the literature, the findings also show multimedia messaging service (MMS) is gaining popularity in Australia with 23% respondents using it occasionally; 13% 1-3 times a month; and 21% 1-2 time a week or more frequently (Figure 6). Email, push-to-talk services and mobile videophone calling services have been also used by some respondents to a small extent. As the 3G technologies become more widely available to Australian mobile phone users, the use of communication services will increase rapidly.

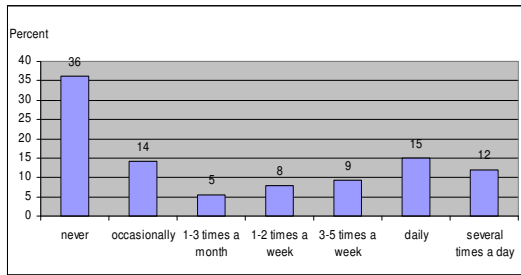


Figure 5. Mobile Chatting Use

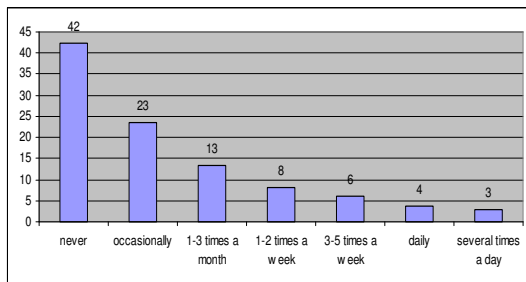


Figure 6. Multimedia Messaging Service Use

For services related to mobile based information, the top three information contents used by some respondents are weather, entertainment and news, as shown in Table 4.

Table 4. Use of Mobile-Based Information Services

	Mean	SD
weather	1.70	1.27
entertainment	1.66	1.21
news	1.61	1.19
sports	1.51	1.11
work related info	1.43	1.14
reference	1.41	1.01
location info	1.36	0.89
education info	1.34	0.93
financial info	1.28	0.86

About 18% of the respondents access weather information through their mobile phone occasionally while only 3% access it daily and 66% have never used, as shown in Figure 6. For accessing entertainment content, 67% have never used and 17% use the service occasionally and for accessing news, 69% never use the service while 18% use it occasionally. News and sports information is also accessed occasionally by 17% and 13% of the respondents, respectively and around 70% have never used it. For other information services, around 80% or more have never used while only 10% or less have used them occasionally.

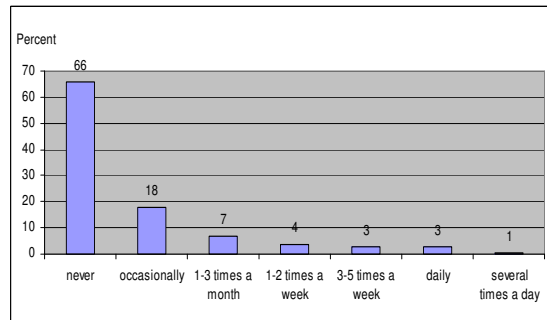


Figure 7. The Use of Weather Information Service

Table 5 depicts the means of responses for using mobile entertainment services. The most frequently used service is accessing mobile games with 54% of the responses have never used, 25% use it occasionally, 10% use it one to three times a month and about 10% use the service one to two times a week or more frequently (Figure 8).

Table 5. Use of Mobile Entertainment Services

	Mean	SD
games	1.89	1.35
audio video clips	1.64	1.21
personal mob web page	1.36	0.99
video	1.35	0.98
cartoons	1.33	0.94
mobile TV	1.23	0.82
adult content	1.12	0.62
gambling	1.11	0.58

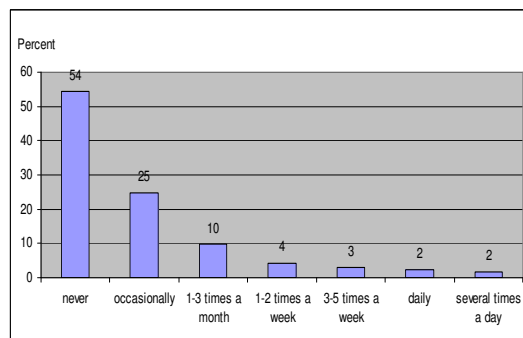


Figure 8. The Use of Mobile Game Service

The use of audio/video clips services was also identified with 16% of the respondents use the service occasionally, 7% use the service one to three times a month and 8% use it more frequently. For other entertainment services, the findings indicate that there is a very low use of the services with 80% or more of the respondents have never used the services and only a very small proportion of the respondents have used them occasionally.

Sources for learning about mobile data services were also identified from the survey, which are

summarized in Table 6. For each possible source, the respondents were asked to indicate the extent they rely on the source to learn about mobile data services based on a five-point scale: 1-not all, 2-rarely, 3-to a moderate extent, 4-to some extent and 5-to a great extent. The findings suggest that respondents believe they learn about mobile data services mostly from friends, followed by internet and TV advertisement. Interestingly, wireless phone stores seem not to be an effective source to learn about mobile data services.

Table 6. Sources for Learning about Mobile Data Services

	Mean	SD
friends	3.18	1.31
internet	3.04	1.35
TV Advertisement	2.74	1.29
magazine	2.46	1.22
newspapers	2.35	1.23
TV Events	2.34	1.26
radio	2.12	1.14
wireless phone stores	2.03	1.23
movies	1.87	1.07
celebrities	1.56	1.00
other source	1.28	0.84

Similar to the identification of the sources to learn about mobile data services, the respondents were also asked to indicate the extent to which each factor listed in Table 7 affects their interest in using mobile data services. The most important factor is the pricing of the services, followed by billing issues and network coverage. New service offering does not appear to affect respondents' interest in mobile data services.

Table 7. Factors Affecting Interest in Mobile Data Services

	Mean	SD
pricing of services	3.81	1.40
billing issues	3.44	1.49
network coverage	3.42	1.49
complicated pricing information	3.37	1.50
customer care experience	3.10	1.46
confusing new services information	3.00	1.47
new service offering	2.83	1.37
other issue	1.37	0.98

Finally, some important characteristics that mobile data services should have to encourage use were also explored. For each factor shown in Table 8, the respondents were asked to indicate the level of importance based on a five-point scale: 1-not at all important, 2-somewhat important, 3-moderately important, 4-important and 5-very important.

The analysis of the mean of responses indicates that mobile data services should be useful and

accessible instantly. In addition, the informativeness of the services and the ability to support better life management are the next two important characteristics.

Table 8. Important Characteristics of Mobile Data Services

	Mean	SD
be useful	3.77	1.30
accessible instantly	3.72	1.36
informative	3.39	1.38
better life management	3.02	1.54
be fun	2.90	1.46
support work activities	2.63	1.56
support personal relationships	2.58	1.56
help kill time	2.47	1.45
other reason	1.23	1.02

5. Discussion and Conclusions

Through a preliminary data analysis of the WMIS data for Australia, insights into the current use of mobile data services in Australia have been obtained. Although the use of mobile data services in Australia is still relatively much lower than in other countries particularly Korea, Japan, Hong Kong and China, this study has indicated besides the use of SMS, a number of other mobile data services are currently used and are expected to gain popularity as the 3G technologies become more widely available in Australia. In terms of mobile communication services, mobile chatting and multimedia messaging services appear to have gained popularity recently. A number of services related to information and entertainment contents have also been used by a small proportion of the survey respondents. Other services including mobile games and mobile shopping appear to gain more recognition in Australia as suggested by the survey data.

The study findings also suggest that pricing of the services is the most important factor affecting Australian mobile phone users in using mobile data services. The relatively low competition in the Australian mobile telecommunication sector, particularly before 1992 has attributed to the high price of mobile data services compared to those Asian countries with a high uptake of mobile data services use. However, with new players including Optus, Vodafone and Hutchison who entered the market in 1992, 1993 and 1995 respectively, there has been significant improvement in the pricing of mobile services in Australia. Moreover, the rapid growth of the Australian mobile telecommunication has promoted collaboration between mobile carriers within the industry to operate and enhance the existing networks for the

sake of efficiency, which ultimately reduces costs for all parties and time to market for new products. Since, those carriers that are involved in partnerships continue to compete for customers through their products and services, customers can gain more benefits through quality products and services than ever before. This is believed to have affected the use of more mobile data services in Australia, as demonstrated in this study.

In addition, the findings also highlight the need for mobile carriers in Australia to put more efforts into increasing the awareness of Australia mobile phone users about the availability of mobile data services particularly new services and devising strategies to enable mobile phone users to access the services easily at a reasonable cost through bundling products and services. Through improvements in the price of products and services, availability of technologies, network coverage, and features of products / services, Australian mobile phone users will be likely to increase the use of mobile data services.

However, mobile carriers also need to understand the needs of the mobile phone users in terms of mobile data services so that only services that are perceived to be useful are offered. Furthermore, the mobile carriers need to ensure that new services promoted are readily available to the potential users. With the uncertainties involved in any new services, mobile carriers perhaps should consider giving free trials for the existing customers so that potential users can quickly experience the services and evaluate their usefulness. As this study indicated, by offering useful services and immediate availability of the services, it is likely that the uptake of mobile data services can be further accelerated in Australia. With the very high mobile phone penetration rate in Australia, a significant increase in the revenue generated from mobile data services as predicted in the earlier studies can, therefore, be manifested.

Further analysis of the survey data could be conducted to identify the significance of the current findings and to explore the relationships between mobile data services use and some demographic data such as genders, age, income and employment. Such analysis can further enhance the understanding of mobile data service use in Australia. Furthermore, a comparative study among Australia, America and some European countries that are part of the WMIS consortium could be performed to explore cross-cultural difference in mobile data services use. Based on this cross-cultural comparison, additional insights

into how to further encourage the use of mobile data services in Australia could be obtained.

6. References

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