"BIG IN JAPAN" – IMODE AND THE MOBILE INTERNET

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ABSTRACT

As technologies for networking and mobile telephony have begun to converge, a new channel has recently emerged for electronic commerce – the mobile Internet. In many countries the adoption of wireless Internet technology by consumers has been slow, typified by the poor reception of wireless application protocol (WAP) in Europe and the US. However, looking further afield the situation is very different. In Japan, the number of wireless Internet subscribers has grown phenomenally, driven by the mobile Internet services provided by NTT DoCoMo. In particular, the high-quality services and sophisticated technological platform provided by iMode has captured a huge market share and the rest of the world's attention. This has provided a potentially powerful stage for electronic commerce. This paper examines the nature of the iMode phenomenon and the future implications for this service platform.

1. INTRODUCTION

The Internet has proven to be an easy and efficient way of delivering a wide variety of services to millions of 'wired' users; as of November 2000, the estimated number of Internet users stood at 407.1 million (Nua Internet Surveys 2000). Not only do the services themselves attract people, but also the convenient way of accessing them via an Internet browser; under most circumstances the same services can be used all over the world - as long as one has access to an appropriately configured personal computer and the Internet.

Throughout the 1990s, another technology that has played an increasingly important role in society is the mobile phone. Again, this is a technology in an age where time is short and the weight attached to convenience is very high. From a saturation of only 8 percent in 1995, more than half of the UK population now own a mobile phone (Wearden 2001). Similar patterns can also be seen in the US, Germany and most other developed countries. In some places, such as some parts of Scandinavia and Hong Kong, the saturation of mobile phone ownership is now

in excess of 80 percent (Fernández 2000). Furthermore, the diffusion of mobile technology is likely to continue well into this decade. By 2003, the global number of cellular phone users is forecast to exceed one billion (Cahners In-Stat Group 2000).

The above technologies once followed very separate paths, but evidence now suggests that they are entering an era of partnership. The convergence of the Internet and wireless technologies is fuelling expectations of growth in wireless data services and a proliferation of business applications of the wireless Internet. Applications include games, email, banking, share trading, travel, news feeds and shopping. Indeed, the mobile platform has tremendous potential for electronic commerce, tailored to the preferences and context of the individual. The commercial value of this new revenue stream is predicted to be very significant. Worldwide, mobile (m-) commerce revenues are expected to exceed $200 billion by 2004 (Strategy Analytics 2000).

Interestingly, one country in particular has rapidly adopted the wireless Internet like no other – Japan. While the US grapples with its fragmented set of mobile network and service standards (Varshney 2000) and Europe experiences the very slow adoption of the wireless Internet based on the Wireless Application Protocol (WAP) (Reuters 2000), the diffusion of wireless data services in Japan has been phenomenal. In February 2001, Japan had 31.6 million mobile Internet users, two-thirds using the iMode platform (Mobile Media Japan 2001).

Although WAP is hailed as the de facto global standard for wireless information and telephony services on digital mobile phones and other wireless terminals (AU System 1999), clearly it is iMode that takes the lead in terms of the number of wireless Internet users. The iMode platform, based on Hypertext Markup Language (HTML), provides a compelling alternative to WAP. This paper explores the nature of iMode and some of the reasons for its success in Japan. Conclusions and predictions are also made regarding the future development and global expansion of the service.

2. THE NATURE OF IMODE

In February 1999, NTT DoCoMo, Japan's leading cellular phone operator, launched the information-mode (iMode) service. Although two smaller players have since entered the Japanses wireless Internet market – EZWeb and J-Sky – iMode remains dominant. This section examines the technology platform and service elements of iMode.

IMode is a mobile phone service that offers continuous Internet access. The transmission technology used in iMode is packet-switched, meaning that iMode is in principle 'always-on'. Whereas the traditional network standards in Europe and the US are circuit-switched, requiring the user to dial-up, in iMode data can immediately be sent and received provided that the user is in an area where the wireless signal can reach the handset. The speed is between 9.6 and 28.8 Kilobits/second (Kbit/s). This mode of access opens the way to a totally different method of billing for wireless data services; users are only charged for how much information is retrieved, not for time online (WestCyber Japan 2000).

As mentioned above, iMode uses a variant of HTML for the provision of Web pages. Of course, the richness of standard HTML pages is too complex for the current generation of mobile phone infrastructure, largely due to the limited bandwidth and high latencies of networks and small screens and limited functionality of devices. Thus, an iMode enabled Web site utilizes pages that are written in compact HTML (cHTML) – a subset of HTML 4.0 designed with regard to the restrictions of the wireless infrastructure. By removing some of the resource-intensive areas of the code – such as tables and frames – the speed of content delivery can be increased.

Figure 1: Examples of iMode enabled cellular phones.

Graphics from http://nooper.co.jp/showcase/, used with permission.

Provision of Internet content to mobile users is via a specially enabled iMode phone and browser application. An iMode-enabled phone weighs approximately 90 grams (3.6 ounces), has a comparatively large liquid crystal display (LCD), and a four-point 'command navigation' button that manipulates a cursor on the display (AnyWhereYouGo 2000b). The user connects to the iMode service by pressing a single button. Several examples of Nokia iMode phones are given in Figure 1 – with both colour and monochrome screens. Many other companies manufacture iMode cellular phones – including Panasonic, Nokia, Ericsson, Sony, Fujitsu, Matsushita and DoCoMo (AnyWhereYouGo 2000a).

The client application used for delivery of information is a micro-browser – a reduced version of a traditional Web browser such as Internet Explorer or Netscape. The most popular browser is Compact NetFront, developed by the Japanese company Access and used in 75 percent of all iMode-enabled devices (AnyWhereYouGo 2000a). The browser has a title bar with icons at the top of the LCD screen allowing the user to access various services including email, bank details, weather forecasts, transportation schedules, data searches and news updates. Below this title bar is the main screen display area that provides text and graphics (WestCyber Japan 2000). An emulated example is shown in Figure 2.

The network operator – NTT DoCoMo - controls the quality of provision of content for iMode. Access to the iMode service is through a portal page, which provides access to around 1480 approved links (Nakada 2001). These provide revenues of around $3.4 billion to iMode; members of premium sites pay additional subscription, 9 percent of which is taken by DoCoMo as a handling charge (Messer 2001). There are also in excess of 40,000 'unofficial' pages created by private individuals (Nakada 2001).

3. THE DIFFUSION OF IMODE IN JAPAN

There appear to be a number of market, technological and social conditions that have contributed to the growth on iMode. These include:

Poor Internet penetration. Before iMode, Internet penetration over traditional wired channels was low and expensive in Japanese homes, constrained by the high online data charges set by DoCoMo's parent NTT. Therefore, there was a high level of price-constrained, unmet Internet demand (Clark 2000).

Figure 2: Example of the iMode micro-browser.

Graphics from http://nooper.co.jp/showcase/, used with permission

Market share. NTT DoCoMo were – and still are – market leaders with 60% market share in the mobile phone market (Red Herring 2000). The majority of DoCoMo's shares are owned by NTT, and the Japanese Government owns the majority of NTT's shares.

Brand loyalty and recognition. As well as NTT DoCoMo being an established and respected voice provider (Datamonitor 2001), iMode quickly became a recognized brand for mobile data services (Kramer and Simpson 1999). DoCoMo's iMode service cements loyalty since high-end users will not want to change email addresses. Furthermore, NTT DoCoMo's early advantage in creating quality content and attracting subscribers has created a positive feedback loop; content providers want to provide iMode before other players due to the large subscriber base, whilst users prefer iMode because of the large volume of quality content (Funk 2000).

Vertical integration. DoCoMo had a strong position in the mobile value chain, being vertically integrated into chip, handset and infrastructure research and development (Kramer and Simpson 1999). This power has been leveraged considerably. For example, DoCoMo received preferential access to the lightest phones from suppliers in exchange for preferential information about new phone standards (Funk 1999). Other technological developments, especially the release of Fujitsu's 256-colour screen phones in December 1999, further enhanced iMode phones at affordable prices (Clark 2000).

Network investment. DoCoMo were proactive rather than reactive in their investment in network infrastructure. In particular, they put in place a packet data overlay on their network, allowing for relatively fast (9.6 to 28Kbit/s), efficient, 'always-on', push-based services that are relatively cheap for consumers (Gan and Tanaka 1999).

Nature of the mobile user. Early on, DoCoMo recognized the trade-off between richness and reach in providing digital services (Wurster and Evans 2000). In providing the iMode service, NTT DoCoMo have emphasized simple content that is easily accessible by people who spend a lot of time outdoors – typically younger people who may spend a much larger amount of their time away from home or the office (if they have one) and use public transportation. Young people tend to place a greater importance on reach and a lower importance on richness than older people (Funk 2000).

Culture. The modern Japanese culture is well known for its enthusiasm for electronic devices – especially amongst Japanese youth (Funk 2000).

4. FUTURE DEVELOPMENTS

The penetration of iMode in Japan has happened very quickly. NTT DoCoMo is now planning to 'export' its iMode model to the US, Europe and other Asian markets. Through a strategy of partnering, NTT DoCoMo hopes to emulate its previous successes with iMode. NTT DoCoMo begins offering a European

version of the iMode wireless Web service in 2002. The service has been developed in collaboration with KPN Mobile and Telia Italia Mobile (TIM) (Associated Press 2001). Clearly the immature US market has sizeable growth potential. With this in mind, NTT DoCoMo has invested $9.8 billion in a 16 percent share of AT&T to open-up access to the lucrative US market (Business Week 2001) - planning an iMode-type service in partnership with AT&T Wireless for 2002 (Theil 2001).

In terms of technological developments, NTT DoCoMo continues to innovate in providing its iMode service. Not least, Japan is the first country to begin implementing third generation (3G) wireless transmission networks - based on the Wideband-Code Division Multiple Access (W-CDMA) standard – allowing transmission speeds of up to 2 Megabits per second and opening the way to advanced audio-visual capabilities (Clark 2000). Originally planned for May 2001, this is now delayed until October. NTT DoCoMo is also working to further advance the service platform for its wireless Internet provision. From January 2001, an upgraded version of iMode is being provided in Japan to premium customers. The new service, called "iAppli" (short for "information applications"), is based on Java. This new platform provides a superior level of sophistication for application programming, including, e.g., elaborate games and automatically updated stock prices or weather forecasts. Notably, applications can be downloaded and stored, thereby eliminating the need to persistently connect to a Web site (NTT Docomo 2001).

5. CONCLUSIONS

The fast growth and financial success of iMode has attracted considerable attention from industry analysts around the world, and many see iMode as an exemplar of a new breed of electronic commerce through the wireless medium. However, other observers argue that the Japanese iMode example is unique and perhaps unlikely to be emulated in the US and elsewhere (Dierks and Skedd 2000). Specifically, other core markets do not share the same conditions that have created a

fruitful environment for growth in Japan; for example, the level of PC-based Internet access is already extremely high in the US and Europe, competition is more concentrated, technology fragmentation has been much higher and vertical integration lower. However, some important lessons follow from the experiences of iMode in Japan, including the importance of a trusted, branded, holistic package of services, and substantial investment in and leveraging of technological infrastructure, such as networks and handsets. Given the high penetration of mobile phone use and slow acceptance of WAP, iMode could provide a convincing alternative for consumers.

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