

Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 2002 Proceedings

Americas Conference on Information Systems
(AMCIS)

December 2002

GLOBAL TRENDS AND ISSUES FOR MOBILE/WIRELESS COMMERCE

Candace Deans
University of Richmond

Follow this and additional works at: <http://aisel.aisnet.org/amcis2002>

Recommended Citation

Deans, Candace, "GLOBAL TRENDS AND ISSUES FOR MOBILE/WIRELESS COMMERCE" (2002). *AMCIS 2002 Proceedings*. 327.
<http://aisel.aisnet.org/amcis2002/327>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2002 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

GLOBAL TRENDS AND ISSUES FOR MOBILE/WIRELESS COMMERCE

Candace Deans
University of Richmond
pdeans@richmond.edu

Abstract

This tutorial addresses current and emerging issues of mobile/wireless commerce with particular focus on global trends. By its very nature mobile commerce is global in scope although additional complexities and obstacles can be expected outside a country's domestic boundaries. Cultural issues play a major role in the acceptance and development of wireless products, standards, and infrastructure to support future developments.

Keywords: Wireless, mobile, m-commerce, global, telecommunications

Introduction

Mobile commerce evolved as the next phase in the digital transformation of business. The Internet and electronic commerce transformed the way business is transacted and redefined the role of relationships with customers, partners, and suppliers. Mobile commerce provides potential for future gains in efficiency through supply chain and internal organizational processes.

Progress is slower than with electronic commerce for several reasons:

- Companies are more cautious to plunge ahead given the recent memories of the dotcom fallout.
- The economic downturn played a major role in the slow advancement of mobile/wireless commerce.
- Telecommunications companies are understandably reluctant to build out the networks to support 3G (third generation) standards.

Although progress varies in different regions of the world, current trends indicate that companies are moving in the direction of mobile/wireless commerce but at a much slower adoption rate than was experienced with electronic commerce.

Global trends for mobile/wireless took a different path than e-commerce. The United States is still recognized as leading in electronic business. Other regions of the world followed the lead and made progress in implementing e-business models and competing on-line on a worldwide scale. The United States, however, is not the recognized leader in mobile commerce. Japan and Europe took the lead primarily because they decided to establish a single standard for wireless. In addition, these countries could more easily and cost effectively leapfrog to mobile technologies. The existing wired infrastructure in the United States made it more difficult to change course.

Worldwide Trends in Mobile/Wireless

Mobile phones are being used all over the world and their use continues to increase. Many infrastructure-poor developing countries are leapfrogging to mobile phones for their communications. This technology does not require the expensive infrastructure and personal investment as PCs and other preceding technologies. A recent development that took off in some countries is the disposable mobile phone. It provides about an hour talk time and it is not rechargeable. This device can be a good

alternative for travelers whose cell phone may not be compatible with standards in another country or a better alternative to traditional pay phones or expensive hotel phone rates.

The Canadian Wireless Telecommunications Association estimates on its web page that by 2005 over half the world's calls will be made with a mobile phone. Currently, China is the largest market with 156 million mobile phone users. Worldwide, 1 billion subscribers were expected by 2003(GSMworld.com). Growth is expected to increase substantially in "world phones" that allow international roaming.

Trends also continue to move toward convergence between mobile phones and other electronic devices such as PDAs. Multi-functional devices such as the smartphone will be the worldwide tradition in the future. Smartphones that combine cell phone, PDA, and wireless e-mail capability are just now hitting the market. Microsoft recently released a sophisticated smartphone in the UK that uses voice recognition and incorporates a hard drive (Microsoft smartphone web page). The phone is expected to be released in the United States within a year. These trends put Microsoft in the middle of the mobile/ wireless game. Microsoft's market entry could make for some interesting alliances and partnerships as the competition shifts to meet the demands of the world market.

This overview section presents a snapshot of worldwide mobile/ wireless trends. Although the specific numbers and data are changing constantly, the general trends are reliable.

Asia

Asia represents the cutting edge of the mobile industry. NTT DoCoMo emerged as one of the company leaders worldwide and recently launched the world's first 3G rollout with video capabilities. In many countries (Japan, Korea, Taiwan, China, Hong Kong) wireless outnumbers fixed. Research by Gartner Group estimated approximately 230 million mobile subscribers in Asia at the end of 2000 (Legard, 2001).

Mobile applications are most popular in South Korea. In schools in Korea, mobile personal ID devices are used. Applications tend toward the consumer audience and focus primarily on entertainment. Video karaoke, for example, is a popular application among the younger generation. The teen population is a major market and a reason for the success of i-mode. Downloadable ringtones and games are very popular with the teen population. Ringtones are ringing tones that play when your phone "rings". Rather than the typical ring, the ring can be personalized to play a national anthem, a Beatle song, or any other sound the user would like. Ringtones make your phone stand out from the rest and are offered by a variety of vendors including Ericsson and Nokia. In the United States, the cost is approximately \$1.00 per minute and customers pay either through their phone company or with a credit card. Ringtones are seen as a killer application for the Asia market. Short messaging services (SMS) are also popular. DoCoMo's c-mode uses coke vending machines to purchase drinks, to download phone applications, and to access information. Cell-phone-mounted cameras are gaining popularity in Japan. Some banking and stock trading is done via mobile access but enterprise applications and company usage is slow to catch on.

In South Korea, in January 2002, SK Telecom launched a phone handset with a credit card slot. These multi-functional smart chip credit cards are expected to promote mobile commerce in the future. In Thailand the speed of the mobile Internet is hindered by English-only WAP browsers. Language capabilities are particularly important in some markets. Eventually, consumers will demand more than one language capability. English may be the language used for business but another language is used primarily at home and for personal needs. These consumers will want two language capability on their mobile device. These issues will become significant in the future as wireless technologies take hold and competition becomes more intense.

Australia/New Zealand

For the first time in 2001, mobile phones exceeded fixed line phones in Australia. Australia and New Zealand are in the process of signing multiple international roaming agreements with foreign carriers. Today, a popular use of cell phones is for parents to track their children (ZDNet Australia).

Wireless services, however, are still not very popular with the consumer market. A popular application in Australia is picture messaging and the idea of wireless pets. Customized ringtones, sports updates, and text-based wireless soap opera stories are also popular (Yahoo Australia/New Zealand).

Europe

Total mobile subscribers in March 2002 in Europe were reported by the GSM Association to total 273 million. Europe leads the United States in mobile technology and penetration. Phone penetration in most western European countries is between 40-60%. 3G licenses bought at auction in Europe were the world's most expensive. Ireland has the world's highest mobile penetration at 79%, followed by Finland and Iceland.

The primary driver of mobile phone popularity in Europe is short message service (SMS). E-mail, infotainment, and downloadable ringtones are also popular. Micropayments for small purchases are being introduced with some success. Personal banking and stock trading is being used but with little emphasis on enterprise applications. The driver of mobile commerce in Europe is clearly the consumer market. I-mode service was recently launched in Germany (March 16, 2002). Belgium and The Netherlands followed in April (Wired World Forum Web page, w2forum.com). Multimedia messaging services (MMS) are expected to elicit very positive response from the teen population.

Latin America

As of December 2001, cellular phone subscribers totaled 83.4 million. The largest markets in Latin America include Brazil, Mexico, Argentina, Columbia, Venezuela, and Chile. Mobile Internet is expected to continue to grow in Latin America since many lack PC access. Popular services in Latin America are informational such as weather, travel information, news, city guides, traffic information and banking (ITU web page).

Progress is evident in countries such as Brazil and Chile. In Brazil, for example, wireless Internet access is expected in 36 Brazilian airports for freight monitoring and warehouse control. Chile boasts of the highest percentage of web-enabled mobile phones in Latin America. Over half of these are concentrated in Santiago (Scheeres, 2001). Progress is expected to continue and include advancements in many other Latin American countries.

North America

As of 2001, there are approximately 133 million subscribers (110 million in the US). Multiple standards in North America are a major reason for the technological lag behind Europe and Asia. Currently, 2.5G is being launched in limited markets and 3G is expected by 2003/2004. In North America, business applications are a major driver of mobile commerce. E-mail, news, and banking/ stock trading are also popular. Some games are increasingly popular but entertainment applications did not proliferate as in Europe and Asia (Network World Fusion).

The Canadian government is very proactive in spending to obtain a more competitive position for mobile. Plans are in place to provide high-speed broadband Internet access to all Canadians by 2004. As of December 2001, 9,946,000 subscribers were reported. (Canadian Wireless Telecommunications Association).

World Standards for Wireless Technologies

Standards for wireless technologies vary around the world. In the United States more than one standard resulted in multiple incompatible technologies and devices. Current systems in the United States include:

- GSM (Global System for Mobile Communications),
- CDMA (Code Division Multiple Access) and
- TDMA (Time Division Multiple Access).

In the U.S., GSM is broadcast on a different frequency than the system used in Europe (Mossberg, 2002). GSM is used by Cingular and VoiceStream. AT&T is in the process of converting its network to GSM. GSM is the standard for Europe and much of the rest of the world except the US. In April 2002, 178 countries in the world used GSM platforms. GSM continues explosive growth according to data released in April 2002 by the GSM Association. More than 167 million new GSM customers were added between April 2001 and April 2002. The growth of SMS services is a driver for new customers (GSMWorld.com). CDMA is the most widespread in the US. Verisign and Sprint use this standard. TDMA was mainly used by AT&T, who is now making the transition to GSM.

Third generation (3G) technology allows for high speed data transmission and reception. In the US, the evolving standard is CDMA 2000, in Japan WCDMA (wideband CDMA) and in Europe UTMS (Universal Mobile Telecommunications System).

Worldwide standards for wireless technology will continue to evolve and differ for regions and countries for the foreseeable future.

Global Market for Wireless Data

The wireless data market is also evolving to meet the increased expectations of business users. Although Japan and Europe may be ahead of the US in consumer use of mobile/wireless, Gartner Group and others would argue that the US is ahead of the rest of the world in wireless data access and the use of enterprise wireless data services (Sherman, 2002). Research in Motion (RIM), for example, offers a solution for corporations that need access to corporate e-mail. This product, known as the Blackberry, has been very popular in the United States. Vodaphone and RIM have recently offered Blackberry services to UK vodaphone corporate customers. Rogers AT&T Wireless is the first to introduce the Blackberry wireless data and voice service in Canada (RIM web page, RIM.com).

In Europe, the two major uses of wireless data networks are short message service (SMS) and wireless application protocol (WAP). These services are limited to device-to-device messaging primarily between consumers. Corporate e-mail and other applications cannot be accessed through these services. WAP has been a disappointment as more viable ways to get the web on a wireless device have emerged (Sherman, 2002).

In Japan, the demand for wireless data access is similar to that in Europe. 3G service was deployed by NTT DoCoMo but Japanese corporations do not yet embrace the technology for enterprise applications. The success of i-mode is primarily the result of easy consumer access to the Internet. The most popular applications are games, ringtones, and other forms of entertainment (Sherman, 2002).

The demand for wireless access to company data is not the driving force for wireless in Japan or Europe. Wireless data access is a major factor in mobile commerce acceptance in the United States because the focus is on business applications. The US consumer market has been slow to respond given the slow speed due to narrow bandwidth, small screens and lack of a killer application to drive the demand. In other countries where mobile devices outnumber fixed line devices and PCs, the demand has been substantial for wireless applications primarily for the consumer market.

Global Pricing Strategies

The pricing model will have a major impact on service offerings and their acceptance by the consumer. These models vary across regions in the world and may also depend on government regulations and policies for wireless carriers and telecommunications companies.

Mobile commerce strategies and business models differ from region to region around the world. Pricing strategies of wireless providers vary from fixed monthly access fees as in the United States to pay-per-minute as in Europe. In some places, pay-per-service is also used. These pricing schemes will have an impact on customer behavior and eventual demand for products and services.

In the United States, for example, some carriers charge a small monthly fee for access to the wireless web with a specified calling plan with free minutes. Once these minutes are consumed a per-minute charge is levied. Another approach that is used is to provide unlimited wireless access but limit the features that can be used. For example, the customer might have access to all content providers but not have access to wireless email. When the consumer upgrades to another plan they pay a monthly fee for the service.

In Japan, the wireless Internet is cheaper and provides greater benefits than desktop access to the Internet. The Japanese technology that led the way in wireless access is i-mode provided by NTT DoCoMo. The pricing model for this service is the packet-per-view and the billing is dependent on the services used. The consumer pays a monthly charge as well as packet transmission charges and information service charges. Transmission charges are based on the total number of packets transmitted

per month rather than transmission time. This trend, however, is beginning to shift toward transmission time models for wireless access.

Likewise, in Europe access to the wireless Internet is more popular than desktop access. Short messaging is the popular service and access is typically billed based on transmission time. The pay-per-minute is used for desktop access as well.

The Global Business Traveler

Varying standards and pricing strategies around the world make seamless integrated service difficult for those traveling from one region of the world to another. Mobile phone service in the United States is not as reliable as in Europe and Japan. Wireless devices and carrier services in the United States may or may not be compatible outside the United States. Disposable cellular phones or renting of equipment in other countries may be a reasonable solution. These options can be expensive depending on the country and service provided. Access to company information and data anywhere in the world from one mobile device is still not a viable reality but trends continue to move in this direction. Making decisions concerning what device and service to purchase is difficult for those looking for compatibility outside their own country.

Worldwide Mobile Marketing and Advertising

Mobile advertising and marketing campaigns require new models and innovative means for reaching customers. Various platforms need to be evaluated for unique advantages and limitations when creating mobile ads. Consumer concerns about security and privacy play a major role in the eventual success of these campaigns. Culture will play a role in the direction these initiatives will take. Privacy concerns, for example, vary among cultures with US consumers among the more concerned about privacy issues.

Cultural differences in Asia, Europe and the United States drive mobile marketing and advertising initiatives and these variables will determine the success of these projects. Japan has experimented more extensively with mobile marketing and advertising campaigns. Spending for wireless advertising in Japan is expected to grow from \$6M in 2000 to almost \$3.0 billion in 2005. Fierce competition is already underway for audio notification and message alerts. In Europe, mobile advertising is dominated by SMS services. Although the European mobile advertising market is currently small, it is expected to grow to \$5.8 billion by 2005 (Wireless Advertising Association).

The success stories, however, are not necessarily transferable to other parts of the world. The US consumer is more likely to view mobile advertising interruptions and distribution of coupons as spam. They are likely to be less responsive to these types of messages.

In the United States, companies are taking a cautious stand on mobile advertising given much uncertainty about consumer attitudes. Since US consumers are not as likely to respond positively to mobile ads, permission marketing may be even more important for mobile applications. Mobile advertising is in its infancy and there are currently few success stories to rely on. Standards have not yet been established although there has been some collaboration among industry players to develop standards. The WAA (Wireless Advertising Agency) is promoting voluntary standards for marketers.

Location-Based Services

Location-based applications will also vary around the world. In the US, for example, e-911 has been a main motivator of these services. Physical security and safety is a major driver for consumers in the United States. The equivalent of e-911 does not exist in other parts of the world. Location-based services in Europe, for example, address consumer needs to obtain timely directions, and locations of restaurants and other establishments such as movie theatres and shopping sites. European consumers are more inclined to use wireless services although pricing strategies are not as supportive of mobile usage and commerce. Location-based services have also proliferated in Asian markets to address consumer needs for timely information on the spot.

Privacy Issues

Privacy continues to be an important issue in the context of mobile commerce. The concerns take on a different meaning than for electronic commerce. Consumers are concerned about having their location known in situations other than those for safety and security reasons. Although the benefits are recognized, location-based services will succeed or fail based on the perception of the consumer about violation of privacy. No formal legislature governs mobile commerce privacy issues but these issues will likely be addressed as demand dictates. This state of affairs follows the trends for electronic commerce. As mobile commerce progresses, privacy will take a less prominent role as consumers experience greater benefits from mobile technology. The benefits will outweigh the risks at some point in the consumer's mind.

Cultural Implications For Wireless Products/ Services

From the previous discussion, it is clear that cultural variables play a major role in the acceptance of wireless products and services. Companies creating products for world markets need to be responsive to these cultural variables. The demand for wireless products and services will be driven by consumer habits and deep-rooted social norms. The Japanese consumer spends much time on public transportation and therefore has more idle time for playing games and need for sending short messages. The teen population in both Europe and Japan have taken to short messaging services (SMS) and use SMS as a primary means to communicate with friends. MMS (multimedia messaging services) promises to be successful with these target markets as well. The US culture is less inclined to spend hours on entertainment or using SMS. The US is more business-oriented and places a premium on information access. The US culture is less oriented to the popular fads of wireless pets and video karaoke, for example, whereas Japan and Korean cultures responded positively to these forms of entertainment.

The Global Digital Divide

Wireless technologies can potentially help developing countries leapfrog expensive wired infrastructure technologies. Wireless technologies may provide benefits that were, until now, cost prohibitive or not recognized as offering potential benefit given the level of poverty in some developing countries.

The OECD estimates that only 5% of the world's population uses the Internet. Of these, a majority live in developed countries. A majority of Internet hosts and secured servers also reside in developed countries. Progress, however, was made in developing countries in recent years. In Africa, for example, all 54 countries have access to the Internet, compared to only 11 in 1997. Internet service providers (ISPs) are more prevalent and competitive in these countries. Cyber cafes are now located in all capital cities in Africa (AllAfrica.com). Even in Afghanistan there is now access to GSM through the recent launch of the Afghan Wireless Communication Company. This GSM network became operational in April 2002 and provides national and international mobile calling as well as voice mail and SMS (GSMWorld.com).

Wireless technology may be a solution to bridging the technology gap that continues to widen between developed and developing countries. Access to this technology may help narrow the gap in income, education, literacy and other areas of divide. Wireless public phones became popular in some developing countries as a less expensive way to provide communication capability for those who would not otherwise have access. In some villages one cell phone is shared by many. In some instances this practice is a business for women living in the village. They can purchase a cell phone and rent usage to others in their village.

In much of the world it is less expensive and requires less time to purchase a cell phone than a fixed land line. The cell phone is the primary line for people in countries like China, for example. Wireless brought hope to many who would not otherwise have access to technology.

Conclusions

Wireless/mobile commerce brings the world even closer together while at the same time promoting connectivity through technology as opposed to face-to-face interaction. As with all new technologies, the implications are positive and negative. On a global scale, the technical complexities and cultural variables continue to play a major role.

As discussed in this tutorial, consumer acceptance of wireless products and services will depend on cultural variables and expectations around the world. Wireless products were slow to catch on in the United States primarily because consumers do not see benefits beyond that offered by the PC. No killer application emerged to push the consumer to wireless products. In countries where wireless is the only reasonable alternative to Internet access, the popularity with the technology is much more substantial. Consumer reaction is difficult to predict and proved to be even more so with wireless.

Even though wireless was slow to take off for a variety of reasons, it will eventually happen but likely at a more gradual pace than e-commerce. Global trends will provide indicators for companies to gauge when and how to implement their wireless strategies for long-term profitability.

References

- All Africa Web page (<http://allafrica.com/>)
- Canada Wireless Communications Association Web Page (<http://www.cwta.ca/>)
- GSM World Web Page (<http://www.gsmworld.com/index.shtml>)
- International Telecommunications Union Web Page (<http://www.itu.int/home/index.html>)
- Legard, D. "Mobile Phone Use Surges in Asia," IDG News Service, April 10, 2001.
- Microsoft Smartphone Web Page (<http://www.microsoft.com/mobile/phones/smartphone/>)
- Mossberg, W.S., "A Guide to the Lingo You'll Want to Learn for Wireless Technology," *Wall Street Journal*, March 28, 2002, p.B1.
- Network World Fusion Web Page (<http://www.nwfusion.com/>)
- Scheeres, J. "Latin America: The Mobile World," *Wired News*, Jan.25, 2001.
- Sherman, L. "US Versus the World," *Field Force Automation*, April 2002, p.32.
- Wireless Advertising Association (<http://www.waaglobal.org/>)
- Wireless Web Web Page (<http://www.wirelessweb.com>)
- ZD Net Australia Web Page (<http://www.zdnet.com.au/>)

Glossary

The following glossary of mobile and wireless technology terms can be downloaded without cost from the following site: The Mobile Glossary – Cahners In-Stat Wireless Group, Report Number IN020434WP, February 2002
http://www.instat.com/catalog/downloads/mobile_glossary_download.htm