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**eReality: Constructing the eEconomy**

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## **Mobile Commerce – Where Are We and Where Are We Going**

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Our panel will focus on mobile commerce and outline the mobile vision its impacts and benefits. Specifically, we shall do this by focusing on where we are with respect to m-commerce and where we are going with m-commerce by highlighting major issues, challenges and developments concerning m-commerce in Asia, Europe and the US. Our panel will also represent the industry perspective with some insights on Nokia and how this company envisages the m-commerce world of the future.

As has been discussed in many reports, e.g. [1], [2], [3] and in many earlier conferences, Europe has seen a strong movement towards M-Commerce over the last years. Due to the enormous market growth of standard GSM telephony, for all future service extensions (HSCSD, GPRS, EDGE or UMTS) extremely optimistic forecasts had been given. This, in turn, induced such extreme business expectations that business cases were calculated well in advance of their realization. As an issue for further discussion this segment of the panel will also raise the question of whether an analogy between the Iridium-case and the present development status of the 3G mobile network and its delayed roll out can be supported. Finally, some remarks on voice-commerce, which could be regarded as a subtype of m-commerce will also be discussed. Voice-based m-commerce has won major attention over the last two years in some European countries, leading to voice portals, voice authentication or voice based payment approaches. By presenting some examples, we will point out that these solutions may be implemented most often in conjunction with conventional web-based solutions, thus opening up just another supporting channel, but not imposing the need to realize a fully functional presentation layer on tiny mobile devices as seen in conjunction with WAP-based m-commerce applications.

Mobile commerce in the United States is maturing rapidly, even though it lags advances made in Europe and Asia. This segment of the panel will present a brief overview of the current status of m-Commerce in the U.S. and discuss implications for the future. Areas that will be addressed include: platform technologies and transmission technologies, clashes of standards for example moving from G-2 to G3 and beyond and standards. The discussion will also address challenges for management which will cover the issues of anytime-anywhere monitoring and tracking, super-connectivity and cost management.

In conclusion, we anticipate that our panel discussion will enable many of the critical issues pertaining to m-commerce to be identified and some potential solutions highlighted. From our panel discussion we hope to engage audience participation and together outline some key areas for future research.

### **Key Questions for the Panel & Audience That Will Be Addressed**

What are the particular issues in m-commerce, opportunities and challenges?

How well is our research addressing them?

What gaps are emerging between research and practice?

Where should our research be directed ?

What are some examples of successful applications?

What does the future hold for m-commerce?

- [1] Müller-Veerse, F. (1999): Mobile Commerce Report. Durlacher Corp.
- [2] Müller-Veerse, F. et al. (2001): UMTS - An Investment Perspective. Durlacher Corp.
- [3] TIMElabs Research Center (2000): Winning in Mobile eMarkets. Diebold Deutschland GmbH, Eschborn,

## **1. The Global Scene Regarding M-Commerce**

We shall address developments in m-commerce across the globe highlighting key issues in Europe, Asia-Pacific countries and the United States. This will serve to develop an all encompassing view regarding developments in m-commerce, deployment of various mobile technologies and the key challenges faced.

### **1.1 Europe**

Europe has seen a strong movement towards M-Commerce over the last years([1][2][3]). Due to the enormous market growth of standard GSM telephony, for all future service extensions (HSCSD, GPRS, EDGE or UMTS) extremely optimistic forecasts had been given. This, in turn, induced such extreme business expectations that business cases were calculated well in advance of their realisation. The auctions in some European countries for UMTS frequency band packages thus led to incredibly high price levels. In conjunction with the marked fall in international stock markets, the telecommunications industry has, since mid 2001, faced severe problems, being part of a serious recession in some European countries which is still lasting (e.g. Germany). Furthermore, the acceptance of new basic services such as GPRS has up till now been very slow and all the test beds for UMTS pilots have failed to show convincing results. With GPRS we see not only the horrendous pricing as a major cause but also the lack of really convincing value-added services on offer. Those advanced services mentioned most often in the literature, e.g. m-payment or ticketing and ordering, have not been introduced widely.

### **1.2 Asia Pacific**

Interestingly, m-commerce has been slow to take off in the Asia Pacific region for a variety of reasons including lack of infrastructure, delay in launch of higher bandwidth service, luke-warm reception of new multi-function handsets and a general “wait and see” attitude. There also, of course, is the generally depressed

global economy that has hit Asia harder and is tending to last longer than in some other parts of the world. Enthusiasm for m-commerce remains reasonably high although expectations have been lowered as pragmatic reality takes hold. Looking more closely at some specific areas:

Hong Kong is struggling to shift perceptions away from the use of phones for audio to use of phones for data. Phones have a penetration rate in excess of 85% in the applicable population, usage prices are quite low and the communication “culture” is mobile oriented. However, data transactions are very small in number and are limited to bits of news, downloading new “ring tones,” and some SMS (especially in the younger generation). It may well take a couple of years (and a much higher degree of trust) along with recognition of extended functionality before serious financial transactions begin to routinely take place. As it currently stands, there are six service providers (for 6 Million people in a small geographic area) which is probably three more than can profitably exist over time. All are trying to provide value added services and looking for “killer applications.” For example, all currently are competing to develop some integrated location-sensitive applications but none have yet to be launched.

Japan is the brightest story in the region. I-mode continues to be successful and act as the model for many in the region and the world. Japanese of all ages are becoming more accustomed to the use of the phone as a data transmission device and the portfolio of goods and services continues to expand. This has, of course, brought with it concerns such as viruses which, for example, swamped the emergency number service for a short time. Transaction security remains a big issue.

China has the potential to move quickly towards m-commerce. The rate of cell phone introduction coupled with the poor existing wire-based infrastructure provides an opportunity. However, there are many problems to be overcome, not the least of which are ineffective payment systems in conjunction with a banking industry that is struggling under mountains of bad debt and focusing attention to meet WTO entrance commitments.

Korea is an interesting example of a country with both heavy use of phones and heavy use of e-commerce that has yet to come together to any great extent in m-commerce. Phones are used for audio and computers are used for internet access and two have yet to merge to any great extent e.g., in wireless PDAs. One minor reason stems from a unique phone system but suspicions are that the real issues are more culturally based in not yet recognizing the phone as a true data device.

### **1.3 The United States**

Mobile commerce in the United States is maturing rapidly. While Europe and Asia move on to new 3G mobile technologies, and Japan begins to experiment with 3.5g technologies, the United States is struggling to move out of second generation

mobile technologies. Part of this is due to the fact that the U.S. was so successful in the installation of the early analog and digital mobile telephone services. It is also due to the fact that the U.S. has struggled to pick among the plethora of choices available for high speed mobile commerce services.

The greater the number of choices has limited the growth of m-commerce in the U.S, but the shift from voice communication to data communication (and the shift from simple phone service to mobile commerce) is slowly taking place. A large number of organizations have made 802.11b technologies available inside their companies. 802.11a (and soon 802.11g) technologies which offer significantly higher bandwidth are also becoming available. One interesting challenge to the large carriers is the emergence of hot-spots in airports and hotels. These hot-spots allow anyone with a Wi-Fi card to login for a fee and begin surfing the net. Costs for the technology have dropped by 80% in the past two years.

So far the volume of business is not sufficient to attract the large carriers. Since the technology is still used primarily for data communication, the large carriers have not paid much attention yet. Att, World Comm and Verizon are the large carriers offering 2 and 2.5 generation service at this time. There is also some 3<sup>rd</sup> generation service being offered on the east and west coasts, but the penetration is very small at this time. The large carriers are treading carefully given the implosion of the telecom sector in the U.S. The demand for text messaging and e-commerce services is growing, but not at the explosive rates seen earlier in Japan and Europe. Part of the reason given for this is the high penetration of the Internet in the U.S. Over 100 million, or about half the population, regularly use this technology. So far, US consumers seem to regard e-commerce as something which occurs on the Internet, while mobile devices are seen as organizers or phones. The spectacular failure of Ricochet, a high speed mobile internet service in big coastal cities is seen by many of the big carriers as a cautionary tale.

At the same time, the ferment of the US entrepreneurial market continues. Recent devices marrying mobile telephone technology, Palm PC and Pocket PC technology have proliferated in recent months. There are also a number of new dual access cards available for notebooks that allow access to either 802.11b or 2.5g networks.

One of the issues fed by this ferment in the US mobile commerce market is the question of which devices the consumer will be attracted to. Mobile phones are popular, although penetration rates run at about half the rates as in western Europe (36% vs 63%). The wireless hand held devices are growing rapidly in popularity, although overall market penetration still remains small. Current Wireless Internet is pegged at 2% in the consumer market, although corporate use is growing rapidly.

The future of m-commerce remains questionable in the U.S. Not the question of whether it will happen. The rapid adoption of m-commerce devices in corporate America proves that. The question is which devices will become popular with consumers. To reach take-off, a mobile commerce device will have to capture the fancy of at least 1 million consumers. So far, no single mobile commerce solution is showing signs of doing that.

## 2. Current Issues and Potential Resolutions

The expectations for mobile commerce products and services is coloured by the hype generated by various consulting companies. The reports published show inflated growth figures in markets-to-be for unlikely mobile commerce products and services. In order to focus serious research and development work it will be necessary to build a good methodology and to find sound and solid market estimates.

IAMSR in co-operation with HHL, ENPC (Paris), City University of Hong Kong, North Carolina State University and Nankiang Technological University of Singapore has in 2001-2002 carried out a series of surveys of expert companies (the sample in each country was 50 companies) in search of potential mobile commerce products and services, possible business models and most promising markets. The results are interesting and can be used as a basis for a focused effort to build market scenarios.

Market scenarios can be built with a scanning and scenario agent technology developed by IAMSR as part of the *Imagine21* project [E28732 (ESPRIT)]. The agents work from a hyperknowledge platform residing on a secure server at IAMSR. The material to be collected is selected on the basis of a scenario storyline, which has been constructed on the basis of insight in mobile commerce products and services built through the expert surveys conducted in 2001. The scanning agents work on a 24/7 basis and may be activated to scan tens or hundreds of data sources and will deposit the take into a data warehouse. The scanning agents have filters to screen out irrelevant material and are built to retrieve only new material from scanned data sources. The scenario agents extract material from the data warehouse and update the scenario reports semi-automatically. The partners of the research consortium have identified the best data sources in each country. The main data sources used so far are Reuters Business Briefing (now replaced by Factiva) and Economist On Line for overall market reports.

The combination of surveys of expert companies and the market scenarios outlines the future mobile commerce markets in terms of products and services. The first results of this work will undoubtedly serve to shape the m-commerce vision in the future.

## 3. mCommerce as a Solution to an Industry Dilemma

Healthcare is the largest service industry in the world and none of us throughout the course of our life can avoid some interaction with this industry. While no country spends more per capita on healthcare delivery than the US, most of the 29 countries of the Organization for Economic Cooperation and Development (OECD) have

doubled their healthcare expenditure over the last 20 years<sup>1</sup>. Thus, cost effective, efficient high quality healthcare delivery is a critical challenge for healthcare at a global level.

Healthcare systems in each nation have to date been shaped by their country's traditions, culture, payment mechanisms and patient expectations. Now however, it is not these differences but rather the commonalties of a global and apparent terminal malady of exponentially increasing costs, an informed and empowered consumer, the need for e-health adaptability and a shift from focusing on primarily curing to the prevention of diseases that are the major challenges of healthcare management in the 21<sup>st</sup> century [4]. Most are agreed that the key lies in the adoption and use of information systems / information technology (IS/IT) in healthcare management [5]; however, views vary tremendously when it comes to how this should actually be brought about. In short then, the healthcare industry is finding itself in a state of turbulence and flux. The key is likely to lie in the adoption of a mobile/wireless solution.

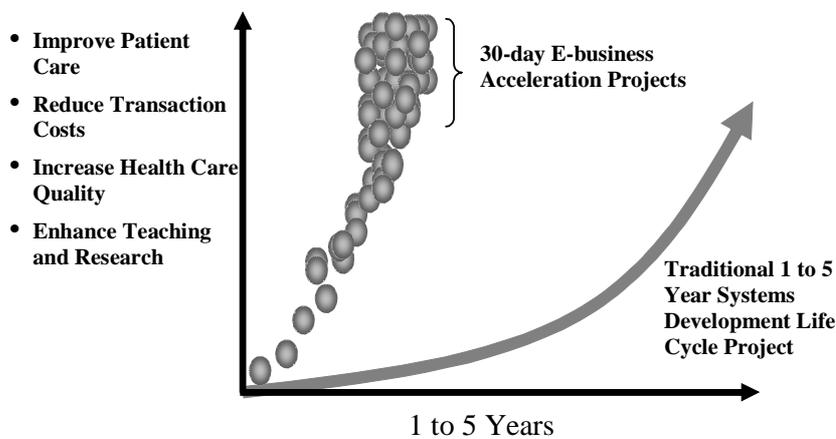


Figure 1: Accelerated Health Care Delivery

Over a period of two years INET International Inc has been conducting research that has been directed at how to apply mobile Internet wireless technologies' low cost advantages to evolve a wireless health care portal (Figure 1 depicts the rapid acceleration afforded by a wireless solution while Figure 2 depicts the wireless environment). A portal is a single point of contact for health care providers and handheld technology applications (HTA) to access and process various data pertaining to patients such as: 1) Patient specific-data (i.e. Patient ID, radiology reports, Lab results, Clinical findings, and research data.), 2) Medical Knowledge (

<sup>1</sup> Figures from study by PriceWaterHouseCoopers HealthCast 2010 report

primarily from evidence based medicine training and journals), 3) Clinical guidelines (i.e. association guidelines such as the Association of Radiologists clinical practice publications.) and 4) Reimbursement rules and data (i.e. Ontario Health Insurance Plan, known as OHIP.) This research has shown that mobile/wireless solutions for healthcare can achieve four critical goals of 1)Improve patient care 2) Reduce Transaction Costs, 3) Increase healthcare quality and 4) Enhance teaching and research.

Help Clinicians Improve Patient Outcomes Using Mobile Internet (wireless) Technology



**INET International Virtual Lab:** HTA proof-of-concepts and clinical HTA trials.

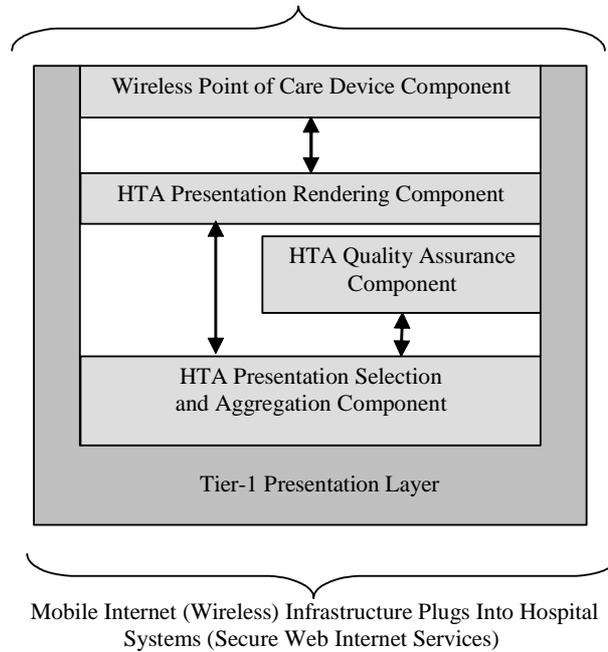


Figure 2: A Standardized Mobile Internet (wireless) Environment

#### 4. Conclusions

Our panel will show that m-commerce is here to stay. Furthermore, we will show that there are many challenges ahead regarding realizing an appropriate mobile vision. Europe, Asia Pacific and the United States face many unique challenges given their respective positions with their embracing of m-commerce. However, there are also global challenges which include but are not limited to developing good research methodologies and robust models and appropriate products and

services. For some industries such as healthcare m-commerce solutions may provide the answer to combat several dilemmas and provide superior quality cost effective healthcare. Clearly the challenges of mobility are not just technological we must not forget social and ethical aspects. Indeed m-commerce offers many exciting opportunities for research and industry to excel. In closing it is important to keep the following key questions in mind:

What are the particular issues in m-commerce, opportunities and challenges?

How well is our research addressing them?

What gaps are emerging between research and practice?

Where should our research be directed ?

What are some examples of successful applications?

What does the future hold for m-commerce?

## **References**

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- [4] Wickramasinghe, N. & J.B. Silvers 2002 "IS/IT The Prescription To Enable Medical Group Practices Attain Their Goals" forthcoming in Health Care Management Science
- [5] Goldberg, S & N. wickramasinghe, 2002 "21<sup>st</sup> Century Healthcare : The Wireless Panacea" working paper