Global Co-Operation in the New Millennium
The 9th European Conference on Information Systems
Bled, Slovenia, June 27-29, 2001

MOBILE ELECTRONIC COMMERCE CHALLENGES FOR GLOBAL COOPERATION KEYNOTE ADDRESS

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1. INTRODUCTION

Two worlds are merging, Internet and telephony. One is already full of global challenges of legislation, tax collection, payment, law enforcement and odd issues. The other is a showcase of global cooperation, continuing a century-old tradition of gradual and standardized internationalization. One is a world of freedom and chaos, the other a domain of control and power. In one everything is wanted for free, in the other charging is the rule.

Internet has created the electronic commerce and telephony invented the mobile user. Today, both parties are already on their way to the other´s turf, and the first clashes of worlds have been observed. On the long run, the synergy promise of mobile and talking, e-commerce is huge, as well as the global challenges it will bring about.

2. LEVELS OF MOBILITY

Mobility of information system use is a package of three ingredients:

- wireless connection to the network
- ubiquituous availability of connection
- possibility to move (roam) during a use session

Taken together, total mobility would require fully covering global wireless access with seamless roaming in all circumstances. Much less is, however, sufficient for practical purposes; even good supply of two ingredients out of the mentioned three might well do in many cases.

Mobile voice has thus far developed relatively isolated from the data processing system evolution, but merging tendencies are already quite obvious here. The subsequent progress of united mobile information world can be visionarily divided into four, consecutive but overlapping waves:

A mobile access to traditional data services, separate mobile voice

B location awareness of client, new client-location based services

C mobile servers with server-location adapted data and voice services

D environment aware clients and servers, mobile community oriented services

Parallel with this evolution, the abilities of terminal devices and performance of mobile data channels will grow as well. In five years, mobile telephones will approach the capabilities of today´s microcomputers, which, for their part, will be able to talk as perfectly as telephones today.

The present misconception of mobile voice or data networks; kept up mainly for commercial reasons, will meet its natural death quite soon. The network consists always of totally stationary fiber optics, only the access to it can be mobile.

3. CHALLENGES OF GLOBAL CONNECTIVITY

Unfortunately it has appeared to be difficult to earn money from access to networks. Here is the reason why the bit pipes behind the mobile access have been tended and invoiced separately, and the driver of substantial funds committed on the continuity of this habit. This has not only created a tremendous price differentiation between principally equal bit packages, but also split the mobile world into less connectible islands in three directions:

- mobility operators in countries and regions
- cellular phone technologies and wavebands
- evolving alternative mobile access tchnologies

Part of this fragmentation seems to be rapidly diminishing with improving cooperation of operators and gradual merging of cellular technologies. Compared with the ubiquitous unity of Internet access, there is still much room for improvement. The pain has obviously been in covering of appreciable mobile access costs according to the Internet rule of no payment for anything.

The worst is still to come. Emerging licence-free wideband access modes (WLAN, Bluetooth) will create their own access islands, at least in the beginning hardly fully compatible even with their own siblings. These wireless connections will be built to Intenet rules from the beginning, but initially limited to data access only. Still, as we know, speech is data, perfectly transferable also over Internet and following its rules. The Berlin Wall will fall.

The challenge of global unified and seamless mobile access is too formidable to be tackled in one step. The first milestones would probably be good coverage and compatibility of cellular solution (wide area) and the settlement of WLAN and Bluetooth standardization (hot spot). How much the battle over voice earnings will hamper the later bridging of these worlds, remains to be seen.

Mobility with incomplete roaming can be supported rather well with terminal devices only, also missing the cooperation of network operators. There are already two- and three-band phones, and Bluetooth will come in addition, not instead of cellular access. As usually, however, war would also here be more expensive than peace and collaboration.

4. GLOBAL AVAILABILITY OF FUNCTIONS

As experienced in the present cellular services, basic compatibility of access and transmission will only serve part of the purpose. If the voice mailbox will not function, caller identity does not transfer or domestic database cannot respond, the mobile service is not fully global. The reasons of deficiencies are easy to see, but hard to cure.

The corresponding problem has been less visible in the global telephony service, because the intermediation needs between operators have been narrower and the pace of development slower. In the fast-moving evolution of combined voice and data services, the model of mutual recognition and transfer of other parties´ services may be too slow, not to speak of formal global standardization. What is left as an alternative, will be the flat structure of Internet access again.

Another issue of global availability of functions will be the terminal compatibility. Thanks to Microsoft - with fingers crossed - the laptops and desktops are truly ubiquitous. For WAP phones and their successors this cannot be (and has not been) achieved the same way, and the road to unity will be more bumpy. The lack of compatibility would limit the service availability and increase the cost. There is a challenge here.

After the first wave of mobility applications, location will be the killer component of service. Anybody, looking beyond the sticky, but controllable privacy issue, will notice the vast need of location-based information, becoming necessary soon enough. Even the supply is globally very uneven, and little or nothing has been done to unify or standardize. There is a real challenge here.

5. GLOBAL TRUST AND MONEY

According to an old textbook, money is a measure of trust. The tough problem of payments in mobile e-commerce is actually a problem of trust, aggravated by the global scope of vast number of participants, all alien to each others. No wonder that the pipe dream of Internet-money; some kind of immaterialized gold nuggets, free from all control and dependencies has attracted minds so much.

Still, both the international trust and money problems have been solved ages ago. Trust can be created by a chain; I know (and trust in) somebody, knowing (and trusting in) somebody, knowing you, and back. This is how the digital certificates work today and how the banking system has moved money already several centuries. An invincible challenge would only be to try to live without the trust chain or account money issued by a trusted party.

Payment is, unfortunately, not the only global trust challenge in m-commerce. On the other side of the immaterial coin are the delivery, quality of merchandise and right to return. Global material logistics is a tangle of transportation problems, tax issues and legal loopholes. The seemingly neat digital delivery by downloading is - in addition - overshadowed by the risk of illegal copying and impossibility to secure honest return of the ware.

The location and community aware future forms of mobile e-commerce will probably increase the weight of digital content as tradeware and peer-to-peer exchange as market. The main obstacle of this will not be the small payment, although improvement is needed also there, but the digital rights management. Unless it is possible to earn money by publishing new content in the Web, the sources will run dry. Global market will not be an attraction, if it can be lost in one act of piracy.

Trust chains always begin and end with a certified identity of a person; the certainty that I am really who I claim. For that a device is needed, trusted by me, to protect this identity and prevent its misuse. There is, however, still a higher degree of trusted device, one trusted by digital property owners to protect the rights to content, downloaded to the device. It remains to be seen, if standard microcomputer can convert itself to a really trusted personal device, or from where else this animal will pop out.

6. GLOBAL SECURITY AND PRIVACY

Security is the foundation of trust, but not all of it. Further, security is needed also beyond the protection of identities for trust creation. The other main areas are securing of service availability and integrity of information. The risks are as global as the threats, the mobility adding another benefit for the wrongdoer.

Airwave access opens a new window for penetration and another opportunity to hamper the service by disturbance. Licence-free frequencies are especially vulnerable for both, unless protected by clever technology and supported by legislation. It would be pity, if the licence income would here distort the interest of society to promotion of one solution only.

Mobile access devices should be lightweight, and they can easily be misplaced or stolen. The personal information inside is therefore vulnerable, and shall in any case be backed up somewhere. It depends on the

cost and capacity structures of transmission and portable memory, to which extent this will direct the development towards thin clients and network-centric mobile solutions.

The amount of sensitive information about a single user, recognized by the network and its servers is also growing. Locations of calls, sites visited, services used, parameters given, payments made or persons contacted will be recorded, not only because of established habit or commercial urge, but in many cases out of sheer necessity to produce the wanted service or experience.

Privacy protection by legislation only is a nearly unsolvable global challenge, because the chain will not be stronger than the weakest link. Sufficiently broadly applied, adequately consistent legislation can, however, be a foundation to build additional safeguards. In a world, where the competitor is a click away, the market forces, pointing out and rejecting unsafe or dishonest service providers, could be an efficient aid to privacy.

Finally, the technology, creating the risk also offers a mitigant. It has long been reminded that protection of Internet privacy can also be delegated to a special actor; infomediary. It is simply a trusted party, connecting my trust chain, simultaneously hiding my identity. Other services of such actor could be back-up storage for sensitive personal data and accumilation of summary information of surfing and shopping behaviour, which is made impossible to commercial forces by the identity protection provided. The collected valuable data would then be personal property to be utilized or hidden according to owner´s choice.

The idea of infomediaries has thus far not really materialized; traces of it can be seen in some advanced network banking services. There is no certainty that it will, but its need will surely be growing together with the global challenges of mobile e-commerce.