

## Guest editorial

# Seamless mobility: more than it seems

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### Guest editors

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### Keywords

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### Abstract

The five papers in this special issue have been selected from presentations held at the 2003 Mobility Roundtable, held at Stockholm. Looks at the inevitable merge of the tele-centric and data-centric world and mobile Internet and how they have enabled mobile access in both professional and personal lifestyles. Evaluates demand, supply and culture. Opines that with future developments hard to predict new actors from other sectors, such as hotels and restaurants could, by merging their interests, provide a seamless roaming service. Conclusions drawn are that conceptions of mobility in all lifestyles will be broadened to expect an environment of continuous usage.

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Seamless mobility was the title of a small workshop in Stockholm, held in September 2001 as a precursor to a series of Mobility Roundtables held over the past three years (in Tokyo, Stockholm, and Austin). The notion of “seamless mobility” has since become more prevalent in, for instance, public debates, industry magazines, research publications and programmes for future research (e.g. sponsored by the European Commission).

Even back in 2001 it seemed inevitable that the tele-centric world of 2/2.5/3G cellular network-based services was likely to merge with the data-centric world based on Ethernet with Wireless LANs (WiFi), as a natural extension providing Mbit/s access at hot spots outside offices and homes. From a user’s perspective, a combination of the two worlds held great promise. Even if WiFi could provide data communication at superior capacity and high speeds at a potentially lower price, there was (and is) also a need for greater coverage on an anywhere/anytime basis, where cell networks have a proven track record. For many cell phone users, even data-rates below 100kbit/s might anyhow be more than enough for most “convenience services” such as checking time tables and bank accounts, or even for sending pictures and streaming video. In less time-sensitive applications, the option of using WiFi or the fixed network has the potential of providing more capacity at a lower cost.

It is largely a matter of perspective. If you start from a data-centric perspective, cellular networks can be an attractive extension, albeit at lower speed and at a higher price per Mbyte. If you start from a tele-centric perspective, WiFi can be an attractive extension, albeit with spottier coverage and quality-of-service. Either way, a more or less “seamless” combination, making the best out of two worlds, looked attractive from a user perspective – but back in 2001 it was decidedly less so from a vendor and operator perspective. Operators of enhanced (2.5/3G) networks looked on WiFi options as a negative challenge, or even as an outright threat “stealing the thunder” from their massive investments in licences and costly new infrastructures.

In light of this general development, and of the three Mobility Roundtables completed since then (Tokyo in 2002, Stockholm in 2003, and Austin in 2004), the initial debate on seamless mobility already looks like history. Most operators have now adopted WiFi as part of their wireless offerings, in some cases as an outright extension of fixed-line and wire-bound services. Future developments are still hard to predict. Will WiFi simply be adopted as a valuable extension by established cellular and fixed network providers? Or will new actors coming from other sectors, like hotels, restaurants, and airlines be able to carve out new business opportunities on their own terms, perhaps by ganging together to provide seamless roaming or

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even free access (earning increased revenues from their core business, rather than from communications *per se*)? The traditional view of an operator or a third-party software house providing the user with mobile services is also, to an increasing extent, being challenged by individual users, who see themselves as altruistic, making services publicly available at no subscription cost.

It might be tempting for us as academic researchers to follow plays in this rapidly changing theatre on an, if not day-by-day, at least quarterly basis. A hopeless endeavour it is, though, since other actors have far more resources tracking and shaping ongoing events. The (unique and important) role of academic research is rather to attempt to grasp a more long-term perspective, staying out of the (present) business events, and thereby detecting also the weak signals preceding later major shifts. Academics may even have a responsibility to blow the whistle, as we did back in 2001, at the height of spectrum auctions and operator beauty contests. As the Devil's Advocate, academic researchers are free to make observations which even the most knowledgeable consultants and employees simply might not dare to state, without unduly risking their contracts.

Voice services have been quite homogeneous. Carrier grade services providing anywhere/anytime access have been their very hallmark. By contrast, non-voice services have a heritage from the Internet world. The Internet services that have gained widespread acceptance on home and office computers do not readily transfer to small, mobile devices that are used on the move. To a large extent, this is due to the limited interaction and screen size, but also because mobile devices are used in completely different situations and environments. When a service "goes mobile", the designer must take into account that the service will be used in public places by users with a very limited attention span. The vision also fails to realize the special features in small mobile devices. They are also highly personal and move with the user, and there is the possibility to use geographical location as an in-parameter to services. The cell phone is mainly a communication device, and services that fit PDA or laptop users may not readily transfer to the phone. When such services become available on phones, user confusion is the result. Many phones provide both MMS and e-mail services, for example. Although both can provide multimedia messaging between phones as well as between phones and computers, their configuration, access models, and cost models are entirely different. Moreover, the services available to the end-users vary both with the phone and the chosen subscription. Phone services that can be

categorized as multi-user, such as those that create awareness between friends regarding presence, availability, and even friendliness, or those that are used for multi-user gaming, are worthy of special attention, since they often create demand in an explosive and sometimes unexpected manner. It is clear that mobile services must be seen in their own right, naturally overlapping with computer-based services and other mobile devices, but with restrictions and opportunities of their own that relate to this particular mobile media.

As a consequence, is the industry heading into a further split-up of the vertical value chain? There are arguments to the effect that WiFi is just a forerunner. There are also arguments of the contrary. The weak uptake of GPRS in Europe compared to i-mode looks like a case in point. Users might appreciate freedom of choice, but not the confusion created by gaps and bad handover between the different parts of the offerings.

While cultural differences are often cited as a main reason for differences in supply of as well as demand for mobile phone services, the series of Mobility Roundtables have to some extent contested this. Many service availability discrepancies between countries are due to non-cultural differences, such as billing policy, cost models, level of acceptance of a particular service, and more. Moreover, there are similarities between such apparently different cultures as Scandinavia and Japan when it comes to the personal sphere around a mobile phone user in public spaces. These similarities can even be measured quantitatively. For instance, one could measure the number of mobile flashers – people who use their phones in public spaces as if they were alone, usually causing inconvenience to people around them – e.g. as a function of the total number of users and the time of mobile phone acceptance.

During the pre-roundtable meeting in 2001, a pivotal issue was why "seamless mobility" had come so much into focus for both business and academia. Possible explanations were proposed from both the demand and the supply side. It was argued that whatever the efforts from the supply side, it would in the end be a matter for the users/customers to decide whether or not all these new services and applications would be really worth paying good money for. They would need to be not only widely available, but "seamlessly" fit into the actual needs of the users' working lives, mobility included, as well as into their private life styles. The five papers presented here, selected from the 30 presentations held at the 2003 Mobility Roundtable at Stockholm, cover a range of both demand and supply side issues.

Against the background of seamless mobility and the I-centric view of mobile networks – the

marriage between 2.5G/3G and WiFi technologies – Bylund and Segall argue that the future of mobile communication networks lies not only in how successful we are in deploying technologies. Also important is how well we can create a functioning environment and usage situation for end-users in which they can get a homogeneous and continuous usage experience. The authors advance concepts that support this observation and propose a possible solution that would take us in that direction (the Personal Server). In their paper, they explore the added factors of user interface and device flexibility, and the notion of user experience continuity. The Personal Server concept illustrates that there are at least partial, technical solutions to the challenges of achieving seamless mobility.

The following two papers also address important end-user issues, both focusing on mobile professionals. Against the background of increasingly ubiquitous and pervasive mobile technologies, Kakihara and Sørensen discuss the emergence of the mobile professional. A field study of more than 60 professional workers in Tokyo during 2002 forms the empirical foundation for their discussion. The paper concludes that we must broaden our conception of mobility and conceptualise mobile professional work in terms of locational, operational, and interactional mobility. A set of implications for a new design of mobile professional work and technology use are drawn from the analysis of the field study. The authors discuss ICT as a mobility-booster, the importance of maintaining multiple ongoing interactions, the importance of personal networks, and finally places as material foundations for interaction.

The third paper, by Sørensen and Gibson, continues the theme, trying to answer the question of the applicability and reality of ubiquitous computing in today's work environment. They argue that the vision of ubiquitous computing provides an idealised framework that can be projected onto the relationship between modern professionals and their technologies. Their study demonstrates that the joint life of professionals and their technologies of choice is not one best characterised by the technical and the social merging seamlessly. It is instead one burdened by constant attention. Based on discussions with professionals on how they use and perceive modern pervasive and mobile technologies, Guest editors highlight some of the issues of a more pragmatic nature relating to the intricate relationships between professional work practices

and the use of technologies in carrying out these practices.

The last two papers shift, from the user and usage situation, to a market perspective. Henten, Olesen, and Su-En Tan provide an empirical overview of the developments of new mobile systems and services in Europe, Japan, and South Korea. They examine the discussions regarding the possible explanations for the present lead that East Asia has in new mobile developments. The comparison is done against the background that Japan and South Korea have taken the lead within mobile communications during the past few years, whereas Europe and in particular the Nordic countries were leading the way with GSM. Factors explaining differences in mobile developments in Europe, Japan, and South Korea are grouped in three main categories: technology solutions, business models, and policy and regulation. The authors argue that the main reasons for the lack of success in developing mobile data and Internet services on the basis of 2G platforms in Europe are related to the slow introduction of packet switching technology and to the implementation of a business model inspired by the fixed Internet. They also discuss various reasons for the slow take-up of 3G networks and services.

The fifth and final paper, by Funk, applies a model of industry formation to explore how mobile Internet services, technologies, and applications will evolve. A key part of the model is the interaction between technological trajectories and the expansion of applications. The application of the model to the mobile Internet is based on published information from both Japanese and English sources, and on interviews with more than 150 managers involved in the mobile Internet, mainly in Japan. Managers were asked about the current and future impact of the mobile Internet on their businesses with a focus on lead users. The author describes a few paths by which the mobile Internet may evolve in six contents/applications. The paper summarizes the origins of the mobile Internet using the model of industry formation, and also sums up the technological trajectories and their effect on these applications.

These Stockholm Mobility Roundtable papers were selected in tough competition and were subject to two rounds of independent reviews. We hope that you agree with us that, together, these five papers go a long way to show why seamless mobility is more than it seems to be.