Some Strategical Aspects for the Development of Mobile Telephony

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Zusammenfassung

Strategische Gesichtspunkte zur Entwicklung der Mobiltelefonie

Jede Strategie zur besten Ausnützung der raschen Fortschritte in der Mobilkommunikation hängt von den individuellen Gesichtspunkten der beteiligten Parteien ab: *Hersteller, Betreiber und Benützer.* In diesem Artikel werden, bezogen auf die GSM-Norm, Strategien für die Mobilkommunikation von drei verschiedenen Seiten beleuchtet und auf einen gemeinsamen, aus den drei Sichtweisen hervorgehenden Nenner gebracht. *Die Strategie wird auch von der bestehenden Infrastruktur für ortsfeste und mobile Kommunikation sowie von den regulatorischen Rahmenbedingungen eines Landes beeinflusst.* Es ist festzuhalten, dass der Bereich der Normierung als erstes angegangen werden muss.

Résumé

Aspects stratégiques pour le développement de la téléphonie mobile

Toute stratégie visant à mieux tirer profit des progrès rapides de la communication mobile dépend des points de vue des intéressés, à savoir *fabricants, exploitants et usagers.* Cet article examine, en se référant à la norme GSM, les stratégies pour la téléphonie mobile sous trois aspects différents et tente de les ramener à un dénominateur commun. *La stratégie dépend aussi de l'infrastructure en place pour la communication fixe et la communication mobile, ainsi que des conditions d'un pays en matière de législation.* Il convient toutefois de relever que les questions de normalisation doivent être examinées en premier lieu.

Riassunto

Punti di vista strategici per lo sviluppo della telefonia mobile

Ogni strategia ideata per sfruttare meglio i rapidi progressi nell'ambito della comunicazione mobile dipende dai punti di vista delle parti interessate: *costruttori, gestori e utilizzatori.* In questo articolo l'autore illustra, in riferimento alla norma GSM, tre strategie diverse per la comunicazione mobile e indica in seguito il principio comune su cui poggiano. *Sulla strategia influiscono anche l'infrastruttura esistente per la comunicazione fissa e mobile come pure le condizioni di base regolatrici di un Paese.* È opportuno ricordare che il settore di cui ci si deve occupare per primo è quello della normazione.

Summary

Some Strategical Aspects for the Development of Mobile Telephony

Any strategy that is to make the most of the rapid advances in mobile telecommunications will depend on the particular viewpoint of the parties involved: *manufacturers, operators and users.* This paper examines mobile telephony strategy from three separate viewpoints focused on GSM, and will conclude with a common theme evident from the strategies of all three. *Strategy is also affected by the existing fixed and mobile infrastructure and the regulatory framework in a given country.* However, a significant area of the needs to be addressed first is standardization.

Comparison USA/Europe

Mobile telephony has evolved in different ways in different places, notably with regard to diverging and converging standards, in the various regions of the world. In the USA, heavy subscriber demand, particularly in the larger cities, has led to increased *pressure on the radio frequency spectrum.* The *result* has been a move from the single uniform analogue AMPDS standard to a *plethora of analogue and digital radio solutions,* such as NAMPS, TDMA, ETDMA and CDMA. All countries of America are expected to follow the US lead.

In contrast, *European cellular services* are moving rapidly from many fragmented analogue systems towards a *unified standard:* the Global System for Mobile Communications (GSM). GSM is now being deployed universally across the European Community and has been adopted in many other countries worldwide. It is also being considered by yet more countries, including those in Eastern Europe.

Whatever the viewpoint or vested interest, GSM is a homogeneous standard that gives an equal opportunity — what might be viewed at first sight as a level playing field — for supplier, operator and end user. Furthermore, this playing field is enormous: the population coverage of GSM is currently just short of two milliard.

It would be more accurate, in fact, to think of GSM as a *level plateau,* its digital technology placing it above its analogue predecessors in terms of functionality and quality of service.

The influence of GSM

GSM will be influential in different ways. The interests and strategies of the three primary parties in taking advantage of GSM will differ, but to a greater or lesser extent, all three groups can enjoy a new set of commercial possibilities and communications services based on GSM technology. The following example illustrates some basic GSM services that will be available to all subscribers.

An example

A UK-based finance director travels to Germany for a meeting. All his calls are forwarded to his UK secretary. A call comes in saying that the contract price crucial to his meeting has been agreed. His secretary sends an alphanumeric *Short Message* to his handset asking him to call her. The director retrieves the message and calls his secretary; he can do so from his own GSM handset because it is a pan-European service, and enters the meeting armed with the pricing.

This example illustrates GSM's international roaming capability and the Short Message Service — neither available under analogue systems — and, although the director is inside another company's offices, he can be confident of GSM's security and privacy making the call from his own handset, which is then billed to his account in the UK.

The problem of unpaid GSM phone bills

This problem is exacerbated by international roaming, because it takes up to six weeks for service providers to track fraudulent calls when they are made outside the provider's country. Meanwhile, service providers — as intermediary between subscriber and cellular operator — must pay the operator for network use. Even Deutsche Bundespost Telekom and Mannesmann Mobilfunk GmbH, which sell their GSM service directly and through independent providers, may limit high-risk customers from roaming.

With GSM roaming agreements multiplying across Europe, service providers say their losses will mount into millions of dollars. And though operators say they are trying to rectify the problem, it is not clear how long it will take. The problems stem from the fact that GSM network operators have not put enough emphasis on billing. Currently, GSM operators do not supply service providers with timely enough information on who is using the network and where calls are being made, so delinquent subscribers can be cut off promptly. In some cases, users cut off in a service provider's home country can cross the border and continue making calls temporarily. Left with the task of billing such users, service providers want them cut off immediately in all European countries.

Europe's GSM operators concede that international roaming has become the foundation of growing subscription fraud. Technology is still not available to immediately prevent subscribers cut off in one country from continuing to make calls in another country. Some GSM operators have agreed to a three-step plan to combat the problem:

- an interim fraud prevention procedure under which the operators monitor roaming traffic in their home networks and alert one another via facsimile of irregular use by visiting subscribers
- a plan by year's end to supply caller records over an on-line service rather than on magnetic tape
- a central clearing-house to monitor all mobile switch centers in real-time (but this may contravene German data security laws).

Manufacturers', operators' and users' strategies

GSM forces on everyone a technical discontinuity that is based on a standardised digital radio interface working in conjunction with an intelligent network infrastructure. *Manufacturers* are starting afresh, unable simply to sell upgrades or additions to existing products.

Each supplier has the same opportunity to develop equipment to meet the standard, so the supplier who can add most value and functionality will fare best.

It is a big potential market: economies of scale can be passed down the consumer chain in the form of lower prices. As many rather than only a few countries are interested in implementing a standard system, there is also a slightly lower commercial risk than usual for manufacturers who will seek to differentiate their offerings from those of other suppliers. The delivery mechanism for these services is mainly on the network infrastructure; the mobile equipment itself and its associated radio path can be considered as the access mechanism to this network. The network provides basic GSM services, but advanced mobile services are within reach. Software packages — developed to provide functionality on corporate PBXs and for Centrex — can be effectively redeployed in mobile exchanges. This will bring the mobile user inside the corporate network. Voice messaging, call screening and other personal services can be made available to enhance end user freedom.

Moving ahead even further from basic GSM, and if we accept that radio is the mechanism, to a network that provides services, we foresee the introduction of true Intelligent Network services, which include mobility, serving both fixed and mobile terminals. *The key of a successful marriage of* both today's and tomorrow's *fixed and mobile communications services* lies, therefore, in the *development of Intelligent Networks (IN)*. These are based on existing and still evolving standards and technologies but far more functionally rich than any infrastructure currently deployed.

In addition to basic mobile voice and Short Message services, intelligence in the network allows the global conference call, integrating the fixed, corporate and GSM networks. Familiarity, ease of use and cost-effectiveness is also retained.

From the *operator's* viewpoint, GSM is also a unique opportunity to offer users the latest technology to provide services not commonly available in the analogue mobile networks. Not only will it provide the basic services for business and personal users. Competition will be greater than currently experienced in the fixed or analogue mobile environments. New mobile operators are being licensed everywhere, challenging the incumbent operators. For the operators, again there is the need to differentiate; this can be accomplished by marketing strategies supported by offering increased functionality and services.

For Eastern Europe, the task is to deregulate and to free the spectrum, currently utilised by the military, for GSM. The interim analogue service at 450 MHz now being built in many areas does not have the capability necessary to support GSM.

End users want a cheap, robust handset, universal mobility and flexibility and, as they have demonstrated, they are willing to pay for it. However, they are at the mercy of what manufacturers and operators can offer, so they need to make their voice known through the user groups represented within the ITU.

Basic GSM services can become a launch pad for a host of additional indivdual and group services delivered through an intelligent network. These can incorporate smart cards, PIN numbers and automatic services initiated by users through the handset.

What is clear from these three snapshots of manufacturer, operator and end user, is that the basis for GSM's success already exists. The success of particular networks, however, is dependent upon how the needs of the end users are met. In the end, the operators determine the roll-out of services, pricing structures and all the other parameters which make an end user choose to subscribe. GSM's intelligent network (IN) infrastructure is the future for all mobile networks, the *platform* on which a Personal Communications Network can be built.

A single concluding message emerges: the growth of worldwide mobile communications — which affects the strategies to be adopted by all players — is not determined by technology, but by how the industry meets customer needs. In this, GSM will play a key role far into the future.

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