

White Paper Enterprise Mobility

Success through
Mobility.

In cooperation with the
Technical University Darmstadt.

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1 Introduction.

In the context of the structural transformation of Information and Communications Technology (ICT), the telecommunications industry must realign itself. Whereas the strict separation of fixed network, mobile telephone network and data network providers was common until now, a strong fixed-mobile convergence is taking place today. The globally relevant Internet standard, the Internet Protocol (IP), for individual and mass communication and the widespread use of broadband connections are evidence of this conversion. The term "Next Generation Network" is used in this regard (cf. White Paper "Next Generation Network").

The next developmental and convergent steps are derived from the clearly growing trend toward mobility. In the business environment, this is referred to as "Enterprise Mobility". Enterprise Mobility refers to the integration of mobile ICT solutions for companies. The company as center of business activity can use mobile technologies to develop into a mobile center of activity. In so doing, mobility can relate to the entire company and to its components (e.g. employees, tools, resources, services and products, software, processes, knowledge and information).

The company acts with products and services on the market. Mobile technologies enable the development of optimal processes, which make it possible to serve the market in an optimal manner. Enterprise Mobility also enables the employees of a company to become mobile, as they can access a full range of company data from anywhere – data ranging from e-mails to up-to-the-minute inventory levels. Within the context of Enterprise Mobility, Mobile Device Management is needed to coordinate the deployment of mobile end devices.

2 Mobility.

Nowadays, mobility means more than just commuting back and forth between location A and location B. Rather, mobility means being able to carry out one's professional activities regardless of time and location. The same applies to private obligations.

2.1 Mobility in classical terms.

The term "mobility" derives from the Latin word *mobilitas*, the root of which effectively means flexibility and speed. Depending on the subject involved, it is possible to differentiate, for example, between social mobility, intellectual mobility and physical mobility.

Social mobility refers to the movement of individuals within professions and the social strata of a society. In this connection, one speaks of social climbing and social decline. A person's intellectual mobility expresses itself in a willingness to adapt to changing situations in life and to learn actively throughout one's lifetime.

Physical mobility is generally associated with the automobile as a mobility-enhancing object. Over the course of the last 200 years, a significant "Mobility Revolution" has taken place. Industrialization, and especially the invention of the steam engine, first introduced a phase of mobility after millennia during which progress occurred only at a snail's pace. The steam engine made it possible to achieve unprecedented speeds, both on land and in water. It became possible to move 10 to 20 times faster, and thereby travel large distances efficiently for the first time. Mass motorization in Western countries during the 1960s ushered in the second wave of the "Mobility Revolution". As a result of this development, large numbers of people were offered the opportunity to attain a high level of physical mobility for the first time in human history.

2.2 Virtual mobility.

Today telecommunication is already heralding a third leap in the development of mobility, one that breaks down the barriers of space and time. By exchanging signals at the speed of light, it enables remote participants in a videoconference to cut "travel time" to near zero. It gives people the chance to appear intellectually – character-based, semiotically or digitally – at any location. It was in this context that the term "virtual mobility" emerged.

Mobility in such an abstract form of information exchange has the potential to replace the above mentioned physical mobility in many areas. Videoconferences and telecommuting are examples of this. The simulation of communicative proximity by means of mobile applications works so well that one can justifiably claim that modern telecommunications, network technologies and mobile applications bring the world much closer together "virtually" than would have been possible through mass physical mobility alone.

Virtual mobility eliminates spatial access and availability limits. In terms of an overarching "technology omnipresence" (ubiquity), the result is "Information Anytime, Anywhere": every type of information and knowledge is present at all times and everywhere.

Virtual mobility enables the intellectual mobility of people at work. This permits knowledge workers to deliver their services in the form of own intellectual performance independent of their current location. These services are then forwarded via networks to the location where the services have been requested.

2.3 Types of mobile communication.

Among the types of communication, a distinction is first drawn between wireless/wireline and mobile/non-mobile. Wireless does not necessarily mean mobile, as clearly illustrated by the following examples:

	Non-mobile communication	Mobile communication
Wireline communication	PC connected to network via network cable	Notebook in a hotel connected to network via modem
Wireless communication	PC connected to network via WLAN	Notebook connected to network via mobile telephone

Table 1: Examples of the difference between wireless and mobile communications

Mobility, therefore, only exists when one is able to access a network (e.g. GSM network or Internet) from anywhere without restrictions. Thus a user is mobile when he/she can move freely within a given system or within a certain cell.

Additional flexibility is gained when the user can move independently between specific cells without having to give up functionality at the same time. This further differentiates the term “mobility” into “intracellular mobility” and “intercellular mobility”. The following table shows an overview concerning different cell classes ordered by coverage.

Cell	Network / Coverage	Range
PAN	Personal Area Network	up to 5 m
LAN	Local Area Network	up to 300 m
MAN	Metropolitan Area Network	up to 100 km
WAN	Wide Area Network	Intercontinental
SAN	Satellite Area Network	Global

Table 2: The different cells and their expansion

A computer connected to the network via WLAN, for example, can only be moved within its local environment. This feature makes it flexible. When one moves to a location outside of the range of the WLAN transmitter (e.g. to another building), on the other hand, the user either has no connection or connects via another available WLAN transmitter. In this case, therefore, the range of such network access must be taken into account.

With a mobile telephone network, the situation is usually different. One can take a mobile telephone almost anywhere and remain continuously connected to the network for the most part. Thanks to roaming, even national boundaries no longer represent technological barriers.

In the mobile computing environment, one can distinguish between three basic types of mobility: end device mobility, user mobility and service mobility.

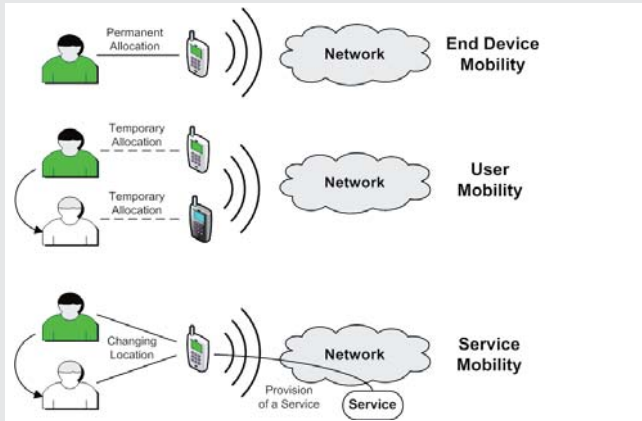


Figure 1: Types of mobility.
Source: Roth 2005

End device mobility.

End device mobility is based on a fixed assignment of a user to an end device. Dynamic connections can be used to connect the end device to the network automatically, which then also remains networked when it is physically moved. End device mobility is generally considered in connection with mobile end devices. The central feature of the location-independent but device-dependent use clearly stands out. The ability to establish and maintain end device mobility simply and conveniently for a reasonable amount of time thus becomes a requirement of a “mobile end device”. For this reason, end device mobility generally requires the use of wireless communication tools. One example of end device mobility is the mobile telephone that automatically remains connected to the mobile telephone network at all times, even when moved across large distances.

User mobility.

In user mobility, the user has the ability to use different access devices. This is not limited to users who are moving. The user can remain stationary at any given location, but is not bound to a specifically designated location or a certain device. For this, a user must have an unambiguous ID attribute, which identifies him/her vis-à-vis the network.

Service mobility.

Services can also be considered as “mobile” when they are accessible everywhere. Thus, the services are the focus of this type of mobility. A user can always access the same services, regardless of the location from which a service is used. An example of service mobility is the worldwide access to one’s own e-mails.

In addition, there is also the important aspect of the mobility of information and knowledge, independent of the services provided. Information and knowledge can be stored locally on mobile end devices or made available via communication networks as services on the end device. This differentiation is important when implementing mobile application systems, in order to distinguish, for example, between online and offline data storage or between online and offline program storage.

3 Enterprise Mobility.

In support of various forms of mobility, a variety of mobile ICT solutions for companies are combined under the standard term Enterprise Mobility. A trend toward mobility in companies is gaining momentum. A company conceived as the center of business activity can use mobile ICT solutions to develop into a web-based mobile center of activity. But what is mobile in this context? A company acts with products and services on the market. In so doing, the company itself comprises agents, the employees. Both areas of action can be supported by Enterprise Mobility. That mobility can relate to the entire company and to its component parts. In considering the topic of Enterprise Mobility, the following analysis differentiates between the case of companies and parts of companies.

3.1 Corporate mobility.

In the area of corporate mobility, the mobile support of the company is the central consideration. In so doing, mobility also expresses flexibility. In this connection, the further optimization of business and operating processes can also be seen in terms of mobile solutions. Some processes are not even possible without the use of mobile technology, such as the automatic inclusion of location-related information. The company also becomes mobile in that knowledge components for employees' actions are available from outside. This is achieved in the area of data exchange through the mobile connection of employees or the infrastructure connection to other company locations with the company's own corporate network.

Improved tracing of company components, e.g. operating tools, is achieved via RFID transponders, which are fitted to the respective objects and can be read out at corresponding stations. This provides the company with more precise information on the condition, quantity and location of the resources recorded in this way.

Enterprise Mobility solutions such as FMC serve to simplify and standardize the formulation of processes. This also simplifies the administration and accounting of communication costs incurred, thereby making these functions more cost-effective. For smaller companies, the use of externally hosted mobile services will be of interest, as they do not possess an adequate mobile infrastructure themselves.

The administration of devices within Enterprise Mobility solutions is handled by Device Management. This Device Management includes the tasks of maintenance and software distribution as well as the implementation of restrictions. Not every employee is allowed to use all of the functions of the end devices made available to them. One can, for example, limit the use of an Internet connection to access for the company's own web pages. One central role of Device Management is to guarantee security, and especially to protect confidential data. Synchronizing data between company sources and the mobile end device is another important component of Device Management.

Enterprise Mobility can provide a standardized platform for all services, which are available via a multimodal user interface, i.e. one that is suitable for various types of end devices.

3.2 Employee mobility.

For 2009, IDC projects 878 million mobile workers worldwide. Companies must support the actions of this group of employees with the most up-to-date information and relevant knowledge. The central challenge in this is to connect mobile staff continuously with the companies' networks for communication, software or knowledge.

This field of application of Enterprise Mobility focuses on the mobile support of the employees in their work. More and more frequently employees exercise their activities not from their own desk in the office of a company, but rather also at other locations within and outside of the company. Project teams organize themselves within a company beyond departmental boundaries. Employees can carry out their activities on behalf of the company from home within the framework of telecommuting. Field staff typically work outside of the company. Providing the employees accordingly with the required information and knowledge is the role of Enterprise Mobility.

Mobile employees would like to use their mobile end devices to access personal data such as calendars, contacts, and e-mails or company applications such as ERP systems. This gives users the ability to process their e-mails also when traveling on business, or to enter test production results directly into the backend system online while on-site at the test object. From the perspective of the mobile employee, an available remote access to the company network is necessary. A large number of specific access solutions exist for this, such as direct dial-up lines, web portals, VPN connections, etc.

For the mobile employee, it is very important to be able to exchange messages. For this purpose, text-based communication options are available such as e-mail, push e-mail, SMS and Instant Messaging (IM). For visual communication, MMS or video telephony is appropriate. Voice communication is also offered by different means, such as VoIP or Push-to-Talk (PTT), a kind of walkie-talkie for certain mobile telephones. A special feature of PTT is the targeted transmission of voice messages to groups of participants (multicast).

The mobile worker expects an appropriate and pre-configured mobile end device that he can use immediately. For this purpose, a platform that provides for the intuitive use of individual application solutions can be installed on the mobile end device.

This basic mobile configuration can be expanded by additional Enterprise Mobility services. Purchases can be paid for directly via cell phone (Mobile Payment Services) and the mobile end device can support the mobile employee with orientation assistance, e.g. by means of off-board navigation.

This and other applications increase the value-adding performance of the individual employee. This can be used to accelerate company processes while cutting overall costs in the company at the same time.

3.3 Mobile technologies.

The most significant mobile technologies include radio standards, packet-oriented data communication and the different mobile end devices.

Radio standards.

DECT

DECT is a short-range radio standard to connect, for example, a mobile part of a wireless fixed-network telephone with the base station. This standard enables wireless communication in a range of up to 50 meters within buildings and up to 300 meters in open air.

GSM

GSM is a standard for full-digital mobile radio networks (2G networks), which are used primarily for telephony but also for line-switched and packet-switched data transmission as well as short messages (SMS). The cellular structure of the network provides for high network coverage, so GSM can be used practically everywhere in Europe.

UMTS

UMTS is a standard for the third mobile radio generation (3G). Higher bandwidths make it suitable for nearly all communication. Such UMTS systems rely on a packet-switched network.

WLAN

WLAN is a broadband wireless LAN standard for the transmission of IP packets. This involves WLAN radio transmitters and their access, which are referred to as Hot Spots. WLAN has a range of approx. 30-100 meters. In this connection, WiFi refers to a certification of different WLAN devices in order to ensure interoperability.

Bluetooth

Bluetooth is a short-range radio standard. Bluetooth offers a wireless interface by means of which mobile end devices such as mobile telephones and PDAs as well as computers and peripherals can communicate with each other. The primary purpose of Bluetooth is to replace cable connections between devices.

RFID

RFID is a passive short-range radio standard. Transponders attached to objects can be used to identify and localize those objects. The range can extend from a few centimeters to several hundred meters.

Packet-oriented data communication.

IP

IP is the most important network standard, which enables a packet-switching data transmission. This standard has become widely known as a result of the Internet. This protocol and the associated protocol family can be implemented on various networks.

GPRS

GPRS is a service for a GSM-based mobile radio network, which serves to enable a packet-switching data transmission. In the mobile telephony area, this has created the ability to charge for transmit data by data volume so that individual mobile telephony callers can remain constantly connected with the network but need only pay for the cost of the data volume actually incurred.

HSDPA

HSDPA is a very high performance transmission process of the 3G mobile radio standard UTMS, which is designed to enable the rapid transmission of large amounts of data.

Mobile end devices.

The large number of extremely different but also very similar devices makes proper classification difficult. End devices are typically classified according to size and performance, and according to application, into: laptop, tablet PC, PDA, MDA, smartphone and mobile phone. Beside this, there is also a number of special devices, e.g. onboard computers for automobiles or handheld scanners for RFID tags.

3.4 Enterprise Mobility solutions.

The technologies in the mobile area are experiencing the same growth relative to performance and transmission speed as in the area of integrated circuits and classical WANs. In these areas, the former head of Intel, Gordon Moore, formulated the so-called "Law of Integrated Circuits" in 1967: Processing speed and storage capacity of the components in the computer industry double every 18 months. What was initially perceived as an incredible prognosis is still proving true today in the form of uninterrupted exponential growth. This performance growth in the technology area put pressure on the industry to complete it with software and useful applications in order to draw a benefit from this "technological explosion". In the future, such developments will enable telecommunication via all of our human senses from any location. With this background, the following sections describe Enterprise Mobility solutions in detail.

3.4.1 Roaming.

Roaming refers to the use of a mobile end device to communicate beyond network boundaries. In this respect, roaming has two meanings. On the one hand, roaming means the property of a mobile telephone network that enables a caller to call or be called from any location. In so doing, the caller need not explicitly enter his/her current location. The current location of the mobile caller is determined by the home network by means of relevant registration of outside networks. On the other hand, Roaming means a caller's option to use mobile telephone networks with which he/she has not signed a contract. For this purpose, various mobile telephony providers have signed roaming agreements. In connection with the required signaling and data lines between network operators, this creates the basis for exchanging access information and billing-relevant data between networks. The best known example of roaming is phoning with a mobile phone abroad. Roaming is not limited to voice service telephony, however, but also enables data services across network boundaries.

In order to use roaming, the mobile end device used must support the network-dependent mobile radio standard (e.g. GSM 1800 or GSM 900). When the mobile device does not support such a standard, the existing SIM card can be installed in a mobile device suited for this purpose. This solution is referred to as SIM card roaming. The outside network then retains the caller's identity. This option also exists with some satellite telephones. A major advantage of SIM card roaming is the availability of the caller under the known mobile telephone number.

Roaming is implemented by means of access by the mobile telephony switching systems of outside networks to the caller register (Home Location Register, or HLR) of the home network of the mobile caller. In this way, it is also possible to check whether a caller has been blocked.

3.4.2 Virtual Private Network (VPN).

Virtual Private Network (VPN) refers to a communications network that uses a public network (e.g. open WLAN) to transport private data. For this purpose, the connection via the public network is encrypted, so the data are exchanged with the confidential network (e.g. intranet) via a tunnel between VPN client and VPN server (concentrator). In the area of IP-based networks, the so-called IP-VPN uses the Internet to transport IP packets independently of the transmission network. This type of network access is considerably more flexible and cost-effective than direct remote access to an internal network, such as direct dial-up via ISDN or mobile telephony.

VPNs ensure security for the authentication of VPN endpoints through the use of passwords, public keys or by means of digital certificates.

With VPNs, there are basically three different approaches.

Site-to-Site refers to the connection of two local networks. For this purpose, both sides use VPN gateways. The VPN connection is then established via these two gateways. With this procedure, all network users can be connected with each other via the respective gateway. An example of an application for this is the connection of the computer networks of two remote company locations.

Site-to-End refers to the connection of a single caller, e.g. an employee outside of the company, with the internal network (intranet) of his/her company. In this case the employee's end device establishes a VPN connection to the company's VPN gateway known to it. Via this connection, the employee is then able to work as if he/she were on the company's local network (Remote Access VPN like Universal Secure Access). This procedure is also used to secure WLANs and other unsecured and public networks (End-to-Site VPN).

End-to-End refers to the targeted connection of two individual end devices that establish a tunnel together. This procedure is appropriate for meeting extremely high security needs. In this way, the entire communication can be encrypted and carried out via networks.

3.4.3 Fixed-Mobile Convergence (FMC).

Fixed-Mobile Convergence (FMC) refers to the convergence of stationary and mobile communication. This results in a merging of the TIME markets (Telecommunications, Information technology, Media and Entertainment). One goal of FMC is to eliminate the previously existing differences and media discontinuities between mobile and stationary networks and services. In so doing, FMC involves both voice and data services. The user should be given access to services that are easy to use and have a uniform "look and feel" in the various network environments. The heterogeneity and complexity of the networks should remain transparent to the user. FMC providers make suitable platforms available for this purpose. FMC callers receive one caller identity (telephone number), one central answering machine (mailbox) and one invoice. FMC provides the user with a higher level of mobility. Integrated services increase convenience and convergence lowers costs, because the user then needs only one provider.

FMC also has a direct impact on the mobile end devices themselves. Dual phone refers to a mobile end device that is suitable for voice and data transmission via fixed-network, mobile telephony network and WLAN. Depending on the application, the communication then occurs via radio connection (DECT, GSM, UMTS, WLAN or Bluetooth) or via the fixed-network or DSL. In this sense, the mobile end device is a combination unit integrating fixed-network telephone, WLAN receiver and mobile telephone. Conversations can be carried out with WLAN reception via Voice-over-IP (VoIP). These end devices are a step toward the convergence of fixed and mobile networks. This achieves end device mobility, user mobility and service mobility.

The characteristics of this convergence are:

- Rate variants and call forwarding (Virtual Convergence)
- Convergence service for message administration: Unified Messaging
- Convergence in messaging: SMS, MMS, IM
- First mile convergence: IP-based Internet and line-switched telephone network (mobile Internet)
- Combination of voice telephony and the associated telephone numbers beyond technical network boundaries
- Triple Play (fixed-network, mobile telephony, broadband) and Quadruple Play (Triple Play with integration of media content, e.g. TV)

3.4.4 Device Management.

Along with smooth technical integration of the solution, the central administration and security of the end devices, data and users play an important role in the mobilization of complex corporate systems. According to IDC, standard requirements include the upkeep of PC hardware and software assets (preventive maintenance), software distribution, administration of anti-virus scan files and the remote control of system diagnoses. In addition, MDM (Mobile Device Management) solutions offer extended functions such as mobile security, restriction of individual functionalities, the ability to recover the system and support for offline and wireless synchronization. A standard synchronization comprises of the data replication between mobile phones and between mobile phone and computer and vice-versa.

A problem area with the use of mobile end devices arises from the security risk due to unintended loss of the device. Such losses occur not only through theft – small end devices are also easy to misplace. Thousands of PDAs are reportedly left behind in taxis, for example. These losses often incur high costs.

The end device price of a few hundred euros in this case is considerably less than the value of the information stored on the end device. In this connection, Device Management offers protection mechanisms for the access to the mobile end device, e.g. via a mandatory password protection and the encryption of the storage and the storage cards as well as the encryption of the data transmission. For particularly sensitive data, a series of wipeout functionalities are offered ranging from the deletion of the software on the end devices up to hard reset ("kill pill"). In the hands of an unauthorized person, a device equipped with such protection mechanisms is wiped completely clean of data and therefore no use.

A central administration of the mobile end devices provides for the integration of the data and the users into the company's ITC infrastructure (System Management). Such Device Management ensures information exchange beyond system boundaries and device standards. In so doing, one important role of Device Management is the recognition of the end devices and network structures in order to compensate for any heterogeneities and specific differences. This recognition of end devices is also necessary to achieve a software configuration tailored to the end devices.

Another feature of Device Management is the implementation of mobile database systems. Following replication with the respective end device profile and the prevailing application situation, data and/or applications themselves are offered as a service of a remote server (online scenario) and/or provided on the end device itself (offline scenario). Between these two forms, there are mixed forms, or so-called hybrid scenarios. Temporary data can be provided on an end device, for example, and these can then be updated asynchronously by the relevant server.

4 The market for Enterprise Mobility.

In a survey of CIOs, analysts have determined that Enterprise Mobility represents a very attractive means of cutting costs. In this respect, the main factors are the strategic management of mobile end devices and the avoidance of expensive roaming charges for mobile voice and data transmission. An additional expectation lies in the area of Fixed-Mobile Convergence (FMC). This combines mobile and fixed-network on a single platform, whereby the customer has only one contract for wireless and wireline communications. The analysts expect strong growth in the FMC area, especially through the use of data transmission and also through the use of VoIP.

A migration of communication revenues is projected to occur as a result of Enterprise Mobility. The total volume of calls remains nearly constant, but it increasingly migrates from the fixed-network to mobile telephony.

4.1 Opportunities and risks.

A survey of CIOs conducted by IDC showed that mobile solutions generally lead to an increase in productivity. Employees need not necessarily be at the company in order to obtain the required information and knowledge. Integrated Enterprise Mobility solutions enable better use of the existing corporate infrastructure. The resulting competitive advantage in terms of information improves the company's overall competitiveness and increases customer satisfaction. Further optimization of business processes through mobile solutions has a cost-reducing effect throughout the company. Reduction of travel expenses can yield cost savings, for example,

or need for costly office space can be reduced by equipping mobile employees appropriately. The results of the IDC survey are presented graphically.

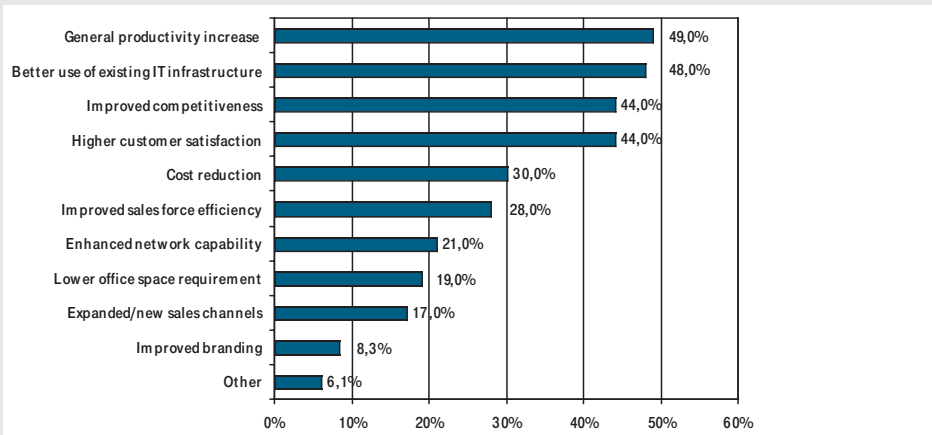


Figure 2: Factors driving the implementation of mobile solutions.
Source: IDC 2005

Along with these opportunities arising from Enterprise Mobility, the same IDC survey also identified risks that should be taken into consideration.

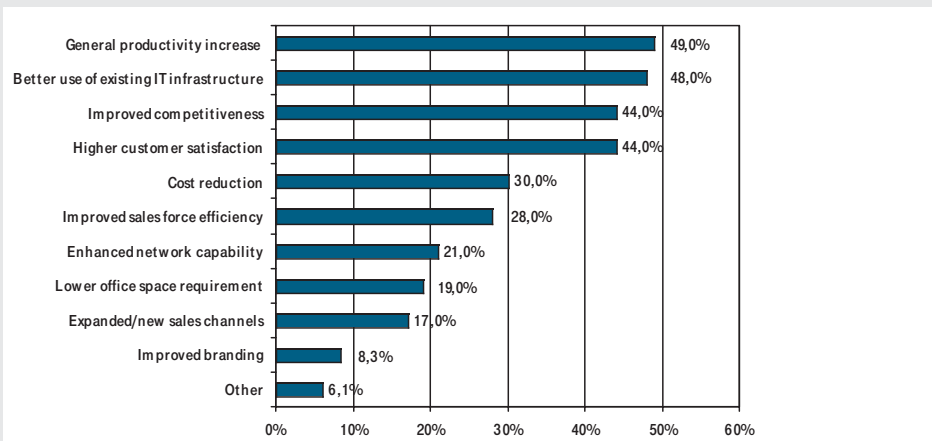


Figure 3: Factors inhibiting the implementation of mobile solutions.
Source: IDC 2005

Security concerns relative to the use of mobile solutions are at the top of the list. This opens up opportunities for those providers offering security as a core competence. Further risks are seen in the additional costs. Slow transmission speeds due to narrow bandwidth are no longer of concern now, as further major developments in the technology of mobile communication continue apace. This represents yet another proof of Moore's Law. Management of the highly heterogeneous end devices is costly because there are too few standardized mobile applications. Device Management is designed to address these risks.

4.2 Development of the market participants.

The market for FMC telephony shows some interesting developments among the participating providers. Various providers approach the topic of FMC from different directions. A leading provider has yet to emerge. No comprehensive, integrated solutions can be found as yet among the product portfolios of the companies studied. For this reason, Ovum suggests strategic partnerships in order to achieve the right combination of individual solutions.

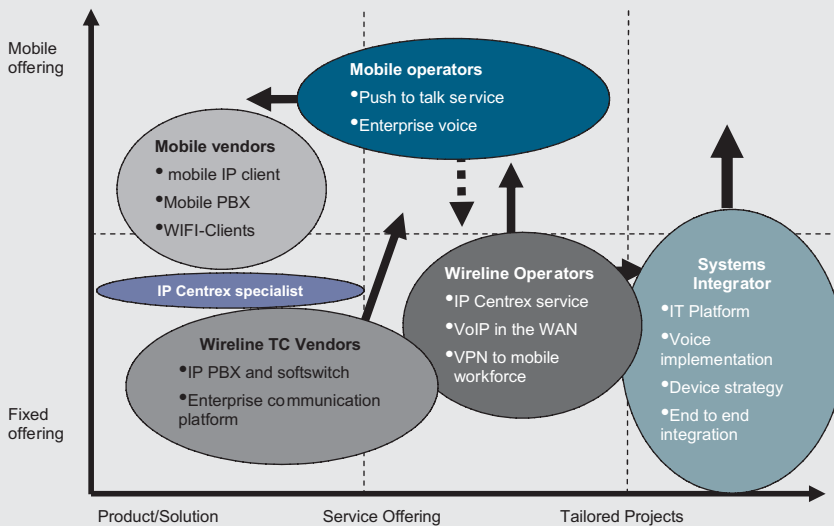


Figure 4: Development of the Enterprise Mobility market.
Source: Ovum 2005a

Fixed-network operators have experience in the administration of voice and data services. They offer data services in the Wide Area Network (WAN) area, provide robust platforms for high data volumes on IP-based networks, and establish a connection to a different network infrastructure. Further development of the offering relative to mobile voice and data service is expected with these companies. This will enable communication from any origin to any end device anywhere.

Mobile telephony operators have a very strong starting position through their experience in the area of mobile voice and data services. But they rely too heavily on the sale of subsidized end devices (e.g. mobile phones) in order to sign and extend mobile telephone contracts while failing to link the rapidly expanding functionalities of modern end devices with useful applications. Moreover, there is a risk to sales through exaggerated branding measures in the sale of special mobile phones, as some of the other manufacturers' models feature extensive functionality or enjoy wide acceptance. In this market segment, a more transparent and simpler rate structure is expected along with a solution for the cost-intensive roaming problem.

Telecommunications providers are starting to enhance their abilities through management services. They traditionally have experience in terms of customer interests, highly developed marketing, innovative solutions and launching new solutions on the market. Further development in the direction of mobile communication is expected.

System integrators have experience in the integration of different platforms. Their business model enables the customer-based tailoring of complex solution projects. The proximity to the customer enables contracts from companies with virtually no experience relative to the desired solution. System integrators will enter the Enterprise Mobility market especially in the area of Device Management and in the integration of fixed-network and mobile telephony through mastery of the underlying middleware. "Middleware" refers here to hardware and software for the exchange between different applications.

4.3 Positioning of T-Systems.

With its convergence projects, T-Systems aims to optimize internal business processes and processes at customers and suppliers, increase employee productivity and reduce the investment and administrative costs of the IT/TC infrastructure.

From the customer's point of view, T-Systems is starting from an outstanding position, as confirmed in a survey conducted by IDC. It rates integrated IT providers with 39 percent approval on cooperation in the mobile solutions environment – the highest level of approval by far – ahead of mobile telephony providers, hardware providers and other categories.

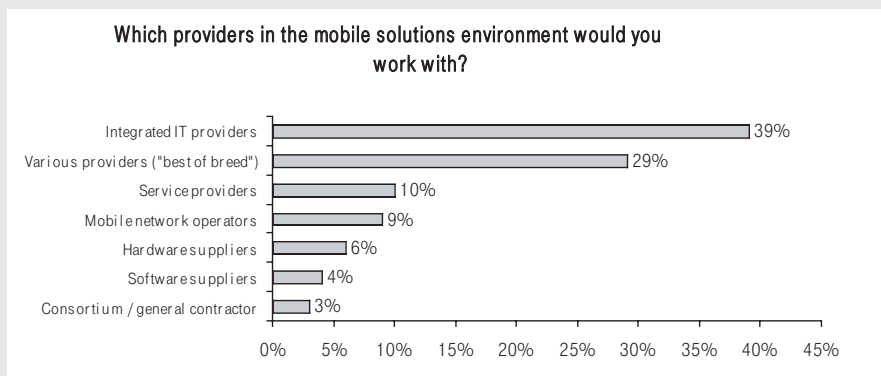


Figure 5: Preferred providers for mobile solutions
Source: [IDC 2005b]

In order to fully exploit the potential of convergence, T-Systems would like to significantly reduce technical and process complexity. In so doing, the mobile phone will become part of the TC system, and Remote Access will be possible securely and seamlessly via all fixed and mobile networks. In this way, the customer will be offered the benefits of a single invoice, a single contract, a single end device and an integrated security concept. This can save costs while improving customer convenience at the same time. In addition, access to all networks is ensured. The customer can thus be reached under a single telephone number without having to program call forwarding constantly – the mobile phone rings in parallel to the end device in the company (twinning function). A further advantage arises from the usefulness of TC system functionalities, which are only partly available in mobile telephony, if at all (conference calling, broker's call, call-back, etc.).

5 Conclusion and outlook.

Enterprise Mobility ushers in an era of mobility in the telecommunications age. The vision of communication with remote communication partners at every location using all of our human senses is thus increasingly becoming a reality. In this respect, the effects of Moore's Law ensure appropriately rapid, exponential growth in the performance of mobile technology. In this way, Enterprise Mobility enables solutions such as the integration of mobile end units into the established corporate infrastructure. In so doing, mobile solutions have a positive impact on the company's productivity, especially through the mobile support of employees who are able to work independent of location, that is to say, at any location.

Glossary of Abbreviations.

DECT	Digital Enhanced Cordless Telecommunications
DSL	Digital Subscriber Line
FMC	Fixed-Mobile Convergence
GSM	Global System for Mobile Communications
HLR	Home Location Register
HSDPA	High-Speed Downlink Packet Access
ICT	Information and Communication Technology
IM	Instant Messaging
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LAN	Local Area Network
MAN	Metropolitan Area Network
MDA	Mobile Digital Assistant
MDM	Mobile Device Management
MMS	Multimedia Message Service
PAN	Personal Area Network
PBX	Private Branch Exchange
PDA	Personal Digital Assistant
PTT	Push-to-talk
RFID	Radio Frequency Identification
SAN	Satellite Area Network
SIM	Subscriber Identity Module
SMS	Short Message Service
TIME	Telecommunications, Information technology, Media and Entertainment
TV	Television
UMTS	Universal Mobile Telecommunication System
VoIP	Voice over IP
VPN	Virtual Private Network
WAN	Wide Area Network
WiFi	Wireless Fidelity
WLAN	Wireless Local Area Network

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