Mobile Commerce Applications in Second and Third Generation Mobile Networks: Potentials and Strategies of Austrian Mobile Communication Providers

Christian Kurz, Angraini Yauw Chen Jo, Günter Haring
Department for Distributed Systems
Institute for Computer Science and Business Informatics
University of Vienna, Austria
{christian.kurz, guenter.haring}@univie.ac.at, a9603882@unet.univie.ac.at
Fax: (+43) 1 4277 384 51

Abstract

In our research we investigate the Austrian mobile communication providers. Besides giving mobile communication market data, the participating companies were investigated. Problems and challenges concerning mobile commerce are discussed and possible future strategies are outlined. Current mobile services and services in development for use in third generation mobile networks are illustrated. In this context cooperations along the value chain, especially with content providers, are discussed. As a requirement for mobile applications, mobile devices are checked for their qualification for mobile commerce applications.

Having characterized the current situation in Austria future developments of mobile commerce are outlined according to the assessments of the questioned mobile network providers. Therefore potential perspectives for mobile commerce applications are characterized. Finally an outlook on the future of the mobile commerce market in Austria is depicted.

1. Introduction

Today, information technology is changing rapidly. Wireless services and Internet services are two successful businesses in communications today. The developments from the fixed line Internet to the wireless Internet have attracted a lot of attention. As the wireless Internet will be merged with the existing one through future technologies, common forecasts predict huge business opportunities, when the mobile telephone world will join with the IP world.

Mobile commerce[1] applications are supposed to become an important area of electronic commerce generating substantial profits. Various mobile commerce providers have built their business plans for third generation networks based on this assumption. Therefore, it is necessary for them to participate in mobile commerce at an early stage to be able to acquire prospective customers and thus to reach a competitive starting position for their future businesses.

The Austrian mobile communications market is currently in an interesting state. Two third-generation networks[2] got operative in the end of April 2003. Additionally to the four established providers two new companies are launching their services, one of them as a third generation network provider only. The established providers have already gained experience offering mobile commerce services in second generation networks. In Austria there are six mobile communication providers[3], who are competing against each other to gain new and to keep their existing customers, namely Mobilkom Austria (A1), T-Mobile, ONE, Tele.Ring, Tele2 and Hutchison (3, Drei). To get insight in current and future developments qualitative interviews have been carried out with people responsible inside five of these mobile communication providers.

Mobile communication providers and content providers want to generate new revenues based on offered mobile services. Either new customers can be acquired which are willing to pay for mobile services or the revenues per customer can be increased. Getting a closer glimpse at the market penetration in Austria, which is about 85 percent already, it can easily be seen that the market saturation is nearly attained. So especially mobile communication providers but also some other mobile market participants will have to shift their strategies

[1] The use of mobile handheld devices to communicate, inform, transact and entertain via an always-on connection to public and private networks, referring to any transaction with monetary value.
[2] networks using UMTS technology
[3] company providing a communication network for mobile services like voice telephony or message services

towards maximizing revenues and profitability in order to keep their investors and clients confident.

The enormous investments for 3G[4] licenses and UMTS network equipment as well as the decreasing average revenue per user forces the providers to acquire new sources of revenues. In pushing advanced mobile contents and mobile services into the market, mobile communication providers try to do so to cover their investments. They also want to transform their businesses from solely providing the communication network infrastructure, to a customer acquisition-focused organization based on new business models. They may provide a mobile information portal or an independent communication infrastructure operation business where they will be able to offer further cooperation with other companies along the value chain.

The question that still needs to be asked is how to spot the customers wallet. The lack of clear pricing and service models has led many customers to disappointment by mobile commerce services and applications because these just haven't met what they were promised mobile commerce will offer.

The following content of the paper will give a hint, how mobile commerce is developing in Austria and how the mobile communication providers are reacting towards the new technology of UMTS. Section 2 gives an overview of related work, the following section details some background information concerning mobile devices and applications. Section 4 characterizes the Austrian mobile communications market and introduces to basic market strategies. Results of the case studies are presented in section 5. Section 6 gives an outlook of the future of mobile commerce. Finally section 7 concludes and gives an outlook.

2. Related Work

This section presents a summary of relevant related work to get a better inside look and understanding of the content and context of this paper. Starting with the protocols that are relevant for the functioning of mobile devices Brunner [2], Steimer [21], the UMTS Forum [24] and many more are giving an overview about the recently used technologies like GSM, GPRS and UMTS. Further more mobile devices and mobile applications are described in [4], [5].

[4] third generation communication network

To gain a better understanding what is going on in the Austrian mobile market, strategies and business models that are relevant for a mobile commerce enterprise and the value chain that includes most of the members of the mobile market are emphasized. The most important strategies that are used in this field are described by Zobel [25], Gora and Röttger-Gerigk [7]. Nicolai and Petersmann [14] as well as Geer and Gross [6] are dealing with the business models and Müller-Veerse and Falk [13] give a detailed description of the value chain. Also statistical data are outlined in this section by the Austrian statistical institute Statistik Austria [20].

The next part of this paper is dealing with the Austrian market itself. Key data, target groups of mobile communication providers, their future products as well as their problems and challenges and market developments are stressed in this section, more information can be found in [16], [17], [18], [15], [23], [22], [10], [12]. Data and information have been gained through interviews with the representatives of each described organization.

Finally future prospects of the mobile commerce market are predicted by many respectable market research institutes like Durlacher, Ovum, Jupiter, Gartner Group etc [8], [9] and [19].

3. Devices and Applications

The following section introduces to mobile devices available today. Section 3.2 shows some examples of mobile applications available in Austria.

3.1 Mobile Devices

Mobile Devices have become very sophisticated universal tools in the last three years, equipped with the newest technology and lots of features. They have become handier, smaller and more functional. In the future wearable terminals working in the users clothes are possible. Currently there are a number of devices, each of them offering different functionality. Therefore those who are responsible for the development of the technology of the tools have to provide, exactly those features in mobile devices which are suited for the customers' needs to attract their attention.

We can categorize mobile devices as following. *Feature phones* are Web-enabled cellular phones, either supporting WAP technology or a micro browser.

Smartphones are a combination of a mobile telephone and a PDA[5]. Connected to the internet through wireless modems or synchronized offline with a web enabled PC, they posses a higher memory capacity than feature phones. *Wireless Webpads* are an extended version of a Smartphone. Webpads have a bigger size and touchpads are used to input data. *Wireless Special Devices* are an extended version of a Smartphone. They are equipped with special functionality such as a barcode scanner. *Wireless Wearable Devices* are mobile devices which are integrated into clothes.

What we will see in the future is that the functionality of a broad range of consumer electronics is going to be more and more transferred and integrated into mobile devices such as MP3-players, digital cameras, voice recorders, FM radios, TVs etc. Gradually functionality of these devices will slowly integrate closer with the functionalities of the above mentioned mobile phones.

3.2 Mobile Applications

M-Applications will heavily depend on the respective enabling technologies. Here are some applications that are offered by Austrian mobile communication providers today or planned for the future.

Communication Services: 3G will enable some important improvements for text based communication. For instance the 'always on' mode will enable chat like instant messaging applications. Besides, Unified Messaging is an emerging service that is crossing the boundaries between different communication media. Voice Mail, SMS[6], MMS[7], e-Mail, fax-messages etc. will end up in the same mailbox.

Mobile Travel Services: 3G systems will become one of the most valuable tools for the travel and tourism industries. Travel information services are often location dependent and location information will be a feature of 3G mobile networks that will then become the key to reach the offered services. Positioning, information and news services will enable an unlimited number of applications.

Mobile Ticketing and ticket auctions might become a very interesting service on mobile devices. The instant transaction capabilities as well as the location independence are the main advantages compared to the fixed line internet.

Infotainment: The 'always on' mode will enable users to get access to real time information at any time and any place. Not only the latest news but also stock quotes, weather information and much more are considered.

Financial and Banking Services: Mobile banking and brokerage services are already in the market and frequently used. They provide a high level of convenience. In particular money services have an enormous potential.

Mobile Office: The use of mobile office applications helps to save time and money, increases staff efficiency and facilitates the emergence of flexible virtual companies with project based employees. Mobile offices enable users to stay in touch with their company anywhere, at any time and any place working with the same productivity as within the company building.

4. Characteristics of the Austrian Market

Section 4.1 gives a short overview about the Austrian mobile communications market. The last section illustrates some basic strategies which are applicable to mobile communication companies.

4.1 The Austrian Market

Figure 1 shows the development of the Austrian mobile communications market. Mobilkom Austria (A1) built the first GSM network in 1995. About one year later in 1996 the first private company T-Mobile went into business, followed by ONE which started services in 1998. The fourth provider Tele.Ring got operational in 2000. In early May 2003 Hutchison started with an UMTS network, also Tele 2 should start as a virtual provider in 2003. The number of employees within the three biggest companies stayed quite constant with Mobilkom employing 2520, 2300 and 2300, T-Mobile 1900, 1900 and 2000 and One 1500, 1600 and 1400 people for the years 2000, 2001 and 2002.

[5] Personal digital assistant
[6] short message service
[7] multimedia message service

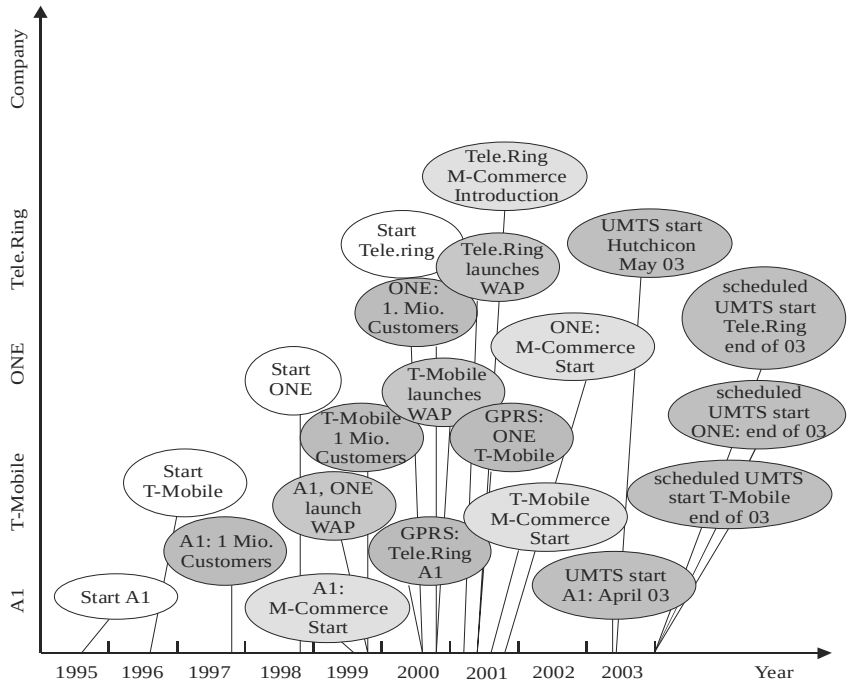

Figure 1: History of the Austrian Mobile Communication Market

Figure 2 shows the number of customers for the three main mobile communication providers for the years 2000 to 2002. Firstly it has to be noted that Austria has a population of about 8 million people. It can clearly be seen that Mobilkom has an advantage because of its early market entry which is extended until 2002. The second biggest company T-Mobile delivers an almost constant number of subscribers but had to give up some of them because of the market entry of ONE and Tele.Ring. ONE could extend its customer basis from 1.2 to 1.4 Million customers.

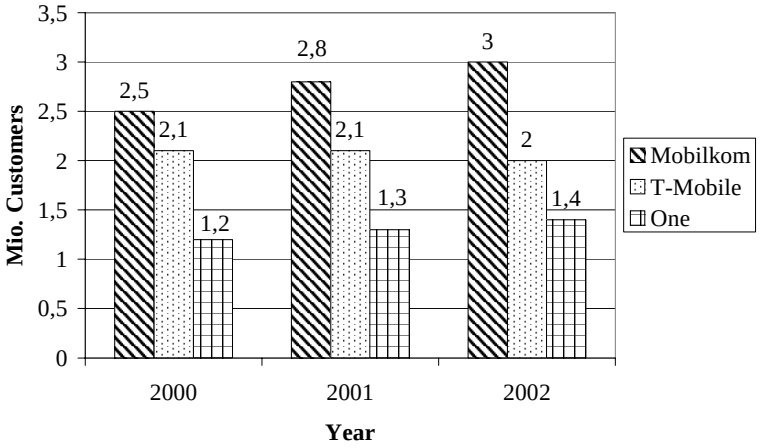

Figure 2: Number of Customers

Figure 3 illustrates the market shares for four of the Austrian mobile communication providers from 2000 to 2002. Mobilkom was able to stabilize its market share at about 44 %, T-Mobile was loosing to the new competitors, ONE could extend its market share to 21% until 2001 when Tele.Ring gathered most of the new market share.

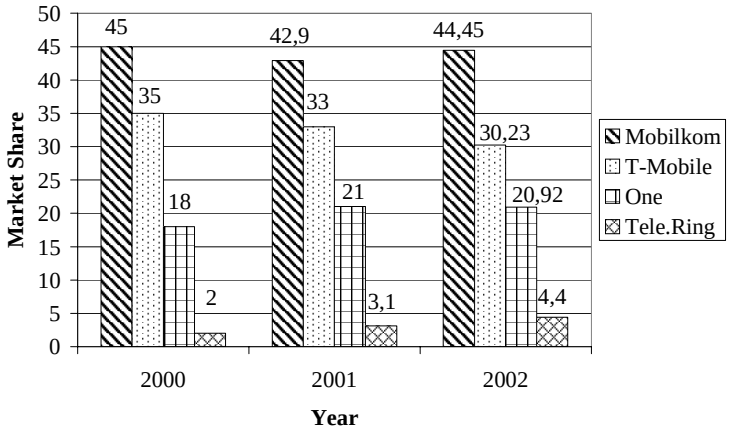

Figure 3: Market Share

In Figure 4 the turnover of Mobilkom, T-Mobile and ONE are outlined, leading to the same conclusions as Figure 3. Mobilkom could steadily extend its turnover, T-Mobile is stagnating and ONE was able to increase its turnover from 2000 to 2002 by about fifty percent.

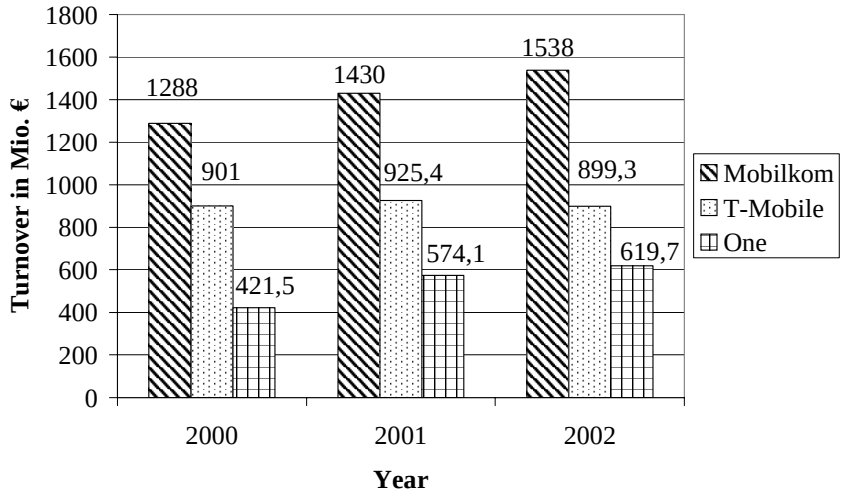

Figure 4: Turnover

At the end of 2003 there has to be 25% UMTS coverage, at the end of 2006 50% of the Austrian people shall live in covered areas. Table 1 summarizes the activities of the six UMTS license holders.

	GSM license	UMTS license	Field Trial	Status
A1	yes	yes	yes	operative
T-Mobile	yes	yes	yes	rollout started
ONE	yes	yes	yes	rollout started
Tele.Ring	yes	yes	yes	no activities
Hutchison	no	yes	yes	operative
3G Telefonica	no	yes	no	no activities

Table 1: UMTS activities

4.2 Market Strategies

Mobile communication providers can apply various strategies to generate revenues. The strategies illustrated in the next paragraph are mainly chosen according to the point in time when the company has entered the market [25].

The *entry strategy* is followed when a company enters a market which is already occupied by other companies. The entering corporation can either want to diversify its existing business into new promising areas to open a new distribution channel or a newly formed start-up enters a fast growing market. Zobel [25] proposes three possible strategies for companies entering a new market:

1. Coevolution: The focus is on early adopters when the market forms. Learning and test experiences can be made which gives an advantage compared to companies which enter the market later.
2. Opening up of new markets: When entering an already developed market the main focus is on marketing to gain customers.
3. Entry with intended exit: The goal is to be bought up by another company, therefore it is important to generate know-how, content and a loyal customer base needed by a competitor.

A *defensive strategy* is chosen by companies which are already positioned in the market against newly entering competitors. The defender has to know where the weak points of his company are and has to make himself strong against the competitor. In many cases the most important issue is to maintain and extend its customer base. That is why the requirements of the customers have to be currently monitored and satisfied, possibly using new technologies to improve existing products. Also cooperations with potential competitors can be formed.

Lastly the *differentiation or growth strategy* allows distancing oneself from competitors. For example it can be realized by finding a unique selling preposition. Through this strategy one can achieve competitive advantage and so stand out from the rest of the challengers. Mobile commerce is offering a lot of possibilities in this field (e.g. price differentiation, location based services). For that purpose technology monitoring is important to provide new services to customers when they become realizable.

5. The Austrian Mobile Communication Market

During extensive interviews with five of the Austrian mobile communications providers, namely Mobilkom Austria, T-Mobile, ONE, Hutchison and Tele 2 which have been conducted within the scope of a master thesis an insight into the Austrian market could be gained which is presented in this section. Unfortunately there is no data available about Tele.Ring who was not willing to provide information for this study.

5.1 Problems and Challenges of 3G mobile services

Currently mobile commerce is only a marginally business in Austria and Europe. Mobile communication providers are not sure which applications can bring added value to their customers for which they will be willing to pay for. On the other hand there is technology lacking to make some of the mobile applications possible, for example the limited user interfaces, the slow transmission speed or the lacking standardization of mobile software interfaces. But all this limitations can be overcome using new technologies like GPRS[8], UMTS[9], and J2ME[10] etc.

Mobilkom Austria discovered a number of problems when dealing with mobile commerce for third generation networks. The UMTS networks will at first only be available in urban areas thus limiting the number of prospective customers. Another major obstacle to be considered is the handover of calls between second and third generation networks at the edges of UMTS coverage. An employee of A1 estimates that it can take until 2006 for the handover to work flawlessly. The second problem is to find appropriate pricing schemes for mobile services offered. At the moment it is not exactly known how much a customer is willing to pay for new services like video calls or location based services. For the start of UMTS, Mobilkom will charge the same rates for second and third generation networks concerning basic fee, calls or SMS[11], charging extra for unique services of 3G like 50 cent for a video clip or 50 cent per minute for video telephony. Another problem mentioned by A1 is the upgrade of the core network involving various competiting partners. Lastly there is only a small amount of money available for the development and establishment of new mobile services because of the UMTS licensing cost.

[8] General Packet Radio Service
[9] Universal Mobil Telecommunications System
[10] Java 2 Micro Edition
[11] Short Message Service

T-Mobile has not yet started a third generation network because it wants to wait until the required network infrastructure is available working absolutely reliable and there is a broader choice of mobile devices. For introducing new mobile applications in second generation networks T-Mobile sees a lack of available bandwidth. Finally the user interfaces of today's mobile devices like keyboard, screen size and resolution etc. are not yet adequate for new mobile services.

ONE identifies the lack of network spanning standards for mobile software and platforms as a major obstacle for delivering mobile services. It should be possible to develop software which can run on a wide variety of mobile devices. ONE wants to determine the needs of its customers to create the appropriate mobile applications. Pricing is considered a major component of the mobile strategy, thus mobile devices and services have to be available at adequate rates.

Hutchison just started operations in Austria. As it is the fifth entrance into the market it will be quite difficult to establish a significant market share. Hutchison operates a UMTS network - being able to deliver services only in a limited area. Therefore it was necessary to use Mobilkoms network to cover the rest of Austria with at least voice communications. The main challenge for Hutchison is to gain a considerable market share. Thus a distinct offer is made to customers which distinguishes Hutchison from the other market players mainly by offering 3G services like video calls and offering packages of services available for a fixed amount of money a month.

Tele 2 is not yet operating. The main problem until now is to obtain a license as a virtual network operator.

5.2 Consequences

The mobile communication providers currently (mid 2003) have problems because of the lack of thoroughly developed 3G network infrastructure which stalls their efforts to offer 3G mobile services. A major obstacle is the handover of calls or data connections between 2G and 3G networks. Besides this the availability of mobile devices is very limited. Not only the quantity but also the quality of these devices, especially the user interface and the battery power, are not appropriate until now. The mobile devices also have to be standardized in a way that mobile applications can be developed only once and be able to run on all available devices.

From the customers perspective the rates charged for services are considered fairly high. Many customers also miss a user friendly interface. Besides, the value of some of the newly offered services cannot be seen by them. This leads to the conclusion that because of these reasons mobile applications are seldom used. Most of the customers are satisfied with services like voice calls and SMS. The danger is that 3G services may fail to gain customer acceptance the same way how WAP services failed. Mobile communication providers therefore do intensive customer monitoring to avoid an UMTS flop. Using test subjects they try to find out which mobile services are accepted and how their customers can handle the user interface. Currently there are still problems with handover of calls between 2G and 3G which are considered to be high priority. Also the 3G networks are extended constantly.

Mobilkom Austria tries to flawlessly move customers to its UMTS networks and its new services. It offers the same pricing structure for 3G as well as for 2G networks making it easy for its customers to accept them. For additional services like video calls additional fees are charged.

5.3 Strategies

Mobilkom Austria (A1) basically pursues a defensive strategy in the mobile communications market as it was the first company to enter the market. On the other side it also extends its business into new areas like the mobile commerce where it applies a differentiation or growth strategy. Mobilkom Austria was innovation leader since it entered the market. A number of technologies were introduced into its networks as one of the first companies worldwide and mostly as the first Austrian company. A good example is applying UMTS which started at the 25th of April as the first Austrian company and only the second in Europe. Since the start of the second UMTS network by Hutchison in early May Austria was the only country with two operating third generation networks open for all willing subscribers. To further strengthen its market position Mobilkom delivers regionally customized products.

The second largest and oldest mobile communications company *T-Mobile* follows basically the same strategy as Mobilkom Austria, that means a defensive strategy to maintain its customer base and a differentiation and growth strategy into new business areas. T-Mobile is not an innovation leader but waits until other companies have introduced technology before it follows. For example UMTS technology will be introduced not until the end of 2003. Customer feedback about the new services offered by Mobilkom and the new competitor Hutchison are closely followed. This strategy minimizes risks but can result in a considerable lag of time to the technology leaders. T-Mobile Austria also depends on decisions done by its parent company T-Mobile Germany.

As *ONE* has already gained a considerable market share of about twenty percent a similar strategy to the first two companies is set in place, using a defensive and also a differentiation and growth strategy. The main focus of ONE in 2003 is directed towards third generation networks where it wants to gain market share. Thus it is astonishing that the start of UMTS is only scheduled about half a year later than the one of Mobilkom and Hutchison. As reasons for that, the currently bad network quality and the limited availability of mobile handsets are stated. ONE wants to rent out network capacity to a virtual mobile communication company when the regulatory terms allow for it which should be in late 2003.

A new mobile communication provider in the Austrian market is *Hutchison* which started its third generation network on the fifth of May 2003. Hutchison operates no second generation network. Thus Hutchison pursues an entry strategy, in detail a coevolution strategy as the UMTS market just starts to be established. As the trademark is unknown in Austria the company has created a new one called *"3"* (Drei in German) which is promoted with great effort. In the first month of operation less than one thousand customers signed up with 3. A problem in the beginning was the intransparent pricing structure. Hutchison has the advantage of having an international parent company which currently also starts 3G operations in other countries like Italy or Great Britain.

Tele 2 is an established company in the fixed line telephony business. With that advantage and thus a large customer base it wants to enter the mobile communications market as soon as regulatory terms allow, as mentioned above, using the network infrastructure of ONE. Tele 2 wants to offer a combined package of fixed line and mobile communications services.

5.4 Current and Future Mobile Services

Mobilkom Austria is starting cooperations with content providers like the national broadcaster ORF or the international news agency Reuters. These companies will operate as content suppliers which will deliver information in real time. For example news magazines from ORF can be watched on 3G mobile devices or business news from Reuters can be received. Besides, live pictures of the traffic on major routes or weather forecasts are delivered. Also events (goals) in the soccer league are available as short video sequences. To use those services

no additional basic fee has to be paid, but each service has to be paid separately. Additionally surfing the internet via a mobile device is possible. In the future live streaming of TV to the mobile device will be feasible.

T-Mobile will introduce UMTS technology in late 2003. Then multimedia applications like video telephony are offered. Additionally services like payment with the mobile phone, mobile office, interactive shopping, games and video clips, online news, location based services like virtual sightseeing, web browsing and much more will become available via 3G. Some of those services are already offered in the existing 2G networks.

ONE intends to enter the UMTS market in 2004. The focus for m-commerce in 2003 is on business customers with emphasis on the mobile office. With UMTS similar services like the ones of the last two providers are planned like video streaming, video calls, music downloads, interactive games, traffic, tourism and weather information etc.

Hutchison offers multimedia services like video messaging, music and video clips, electronic postcards, interactive games and ticket and news services. They offer a basic rate which includes a limited number of accesses to the offered services.

5.5 Target Groups

Currently about 85% of Austrians poses a mobile phone [11], in urban areas the penetration rate is 91%, in rural areas 76%. The urban residents tend to be more indifferent about prices than the rural residents which are quite price sensitive [11]. Surfing the internet and downloading video clips using a mobile device is mainly demanded by rural residents which points to a lack of access through other means of communication.

According to the interviews *Tele 2* will firstly focus on male customers who are between 20 and 40 years old. The target group is mainly educated and located in the upper social class. They are open-minded in regard to new technology and services and therefore an ideal test group to introduce new services.
ONE focuses on business customers offering them mobile applications which allow for simplification and acceleration of business processes.
Both *Mobilkom* and *Hutchison* serve private and business customers without any closer definition of their target groups.

Hutchison offers business customers access to news (text or video) for various areas like the stock market. Additionally there are services for video conferencing, electronic banking, stock brokering or the purchase of flight or concert tickets. Private customers are offered mobile services like news, weather forecast, traffic information, multimedia on demand and more.

5.6 Content Providers

Critical for the success of mobile commerce is the availability of content the customers are willing to pay for. This section will give a short overview about three Austrian content providers offering a variety of different services, the ÖBB[12] (m-ticketing), the ORF[13] (m-entertainment) and the BA/CA[14] (m-banking).

The *ÖBB* sells electronic tickets via WAP; additionally customers can query the time table. There are about 50000 queries a month and about 5000 booked electronic tickets a month. For the future additional services providing information in case of delays, route planning, train configuration etc are planned.

BA/CA offers access to customer data via WAP and SMS. For example there are about 20000 SMS a month to check the current account balance. The low speed of WAP is seen as a major obstacle for its usage, it is assumed that with UMTS there will be fewer problems. Major problems identified are security concerns about WAP usage, the lacking standardization of mobile hard- and software and the low speed and stability of mobile communications together with the not satisfactory user interface. About 13% of the banks 900000 customers use electronic media to access their accounts. They are seen as the potential customers for mobile commerce. Until 2005 it is estimated that 500000 customers will use online services. For the future the bank wants to offer its services like identification and certification of customers or clearing services to other companies in the mobile communication value chain.

ORF currently provides a service for the listeners of one of its radio stations. People can ask for the title of a song which is on air using WAP or SMS.

---

[12] Österreichische Bundesbahnen – Austrian Railway
[13] Österreichischer Rundfunk – Austrian Broadcast
[14] Bank Austria / Creditanstalt, biggest Austrian bank

6. Future of the M-Commerce Market

It is not yet clear where and how fast M-Commerce will penetrate into the global markets. Much of the promise of M-Commerce remains still at the prototype stage. However, the move towards mobile commerce is gathering pace. The usage of mobile phones is currently well established and sales are soaring, outpacing existing and forecasted PC sales.

M-Commerce could prove to be a very promising opportunity to expand subscriber numbers, increase revenues, increase customer loyalty, and differentiate market members from their competitors. The mobile phone, for example, could become a single device for offering personalized services and gathering customer information. Customer relationship management (CRM) and personal information manager (PIM) systems could potentially know all about users, their preferences, and their movements in real time.

M-Commerce has not yet provided enough convenience to persuade consumers to prefer it. The limited growth can be attributed to the fact that, in general, technological advances happen rather quickly compared to the time it takes for consumers to adjust to and adopt them. However, the mobile commerce market is likely to continue to grow at a high rate because there are already more cell phones than PCs. Once cell phones can offer more applications and services consumers will be quicker to adopt them. In addition, the emergence of third generation UMTS cellular technology will allow for increased communication traffic making wireless devices more efficient and usable. In the future, we can expect to see all industries making extensive use of wireless technology in some form such as in terms of customer service as well as in daily business practices. This scenario may still be a while off due to integration difficulties such as usability, compatibility and security issues. As these issues are resolved wireless technology will grow exponentially in the number of users and applications. As more people use it, the more necessary it will become for other people to use it and it will grow to an extend, where customers and companies are dependent on it.

6.1 Globally

If not separately labeled the data presented in this subsection is obtained from [8] and [9]. Figure 5 gives an overview about the percentage of all mobile phones that are capable of using mobile internet services. The highest penetration was reached in Japan with 72%, probably due to the i-mode services.

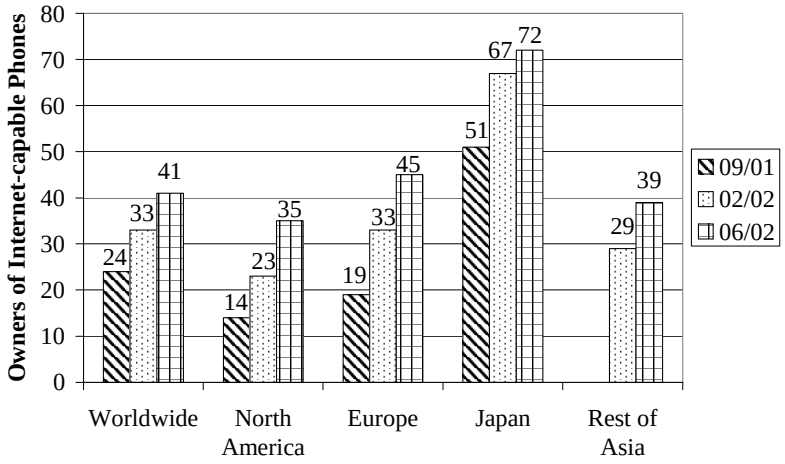

Figure 5: Owners of Internet-capable Phones in Percent [9]

Figure 6 shows the estimated worldwide turnover. It firstly grows very rapidly to 127 percent from 2002 to 2003; finally the yearly growth rate sinks to 34 percent between the last two years.

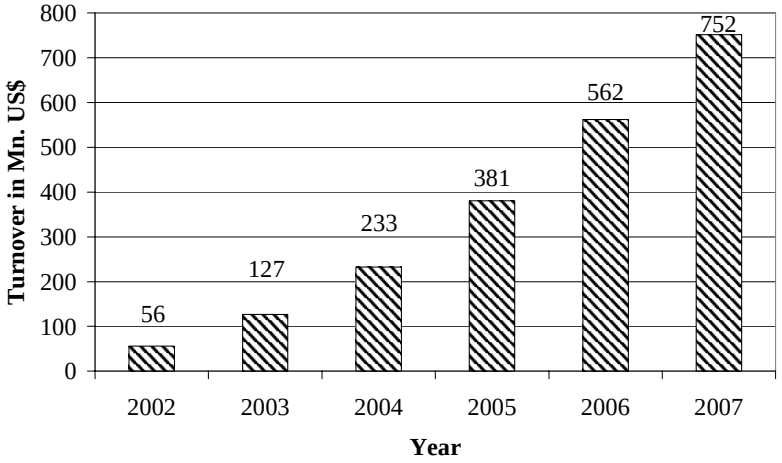

Figure 6: Worldwide M-Commerce Turnover [9]

Figure 7 shows the mobile Internet usage for the year 2001 and the estimation for 2005. As can be seen in the figure an explosive growth is expected.

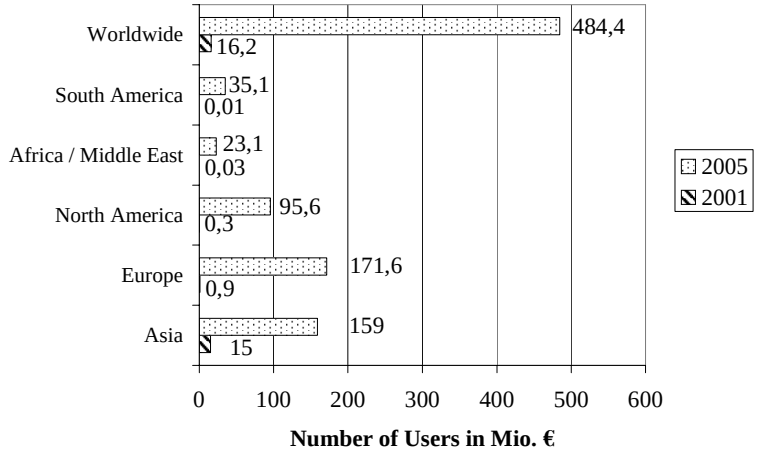

Figure 7: Mobile Internet Usage Worldwide [8]

Figure 8 separates mobile commerce revenue according to the services offered for the year 2003. Most revenues will be generated by advertisements (23%), financial services (21%) and mobile sales (15%).

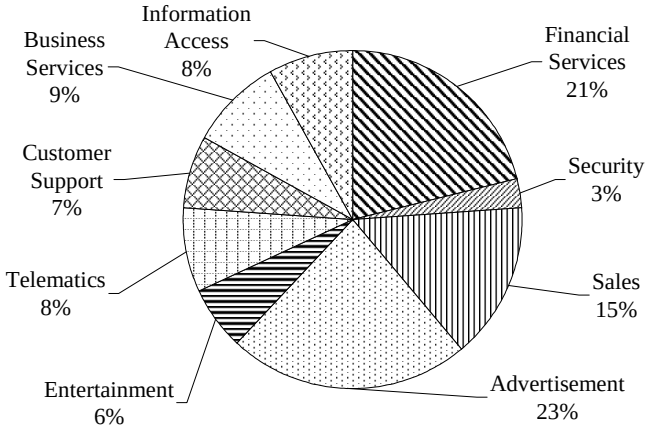

Figure 8: M-Commerce Revenues [8]

Figure 9 details the most common used mobile applications which are estimated for the year 2010 (MM means multimedia). As can be seen mobile speech still is the most widely used service.

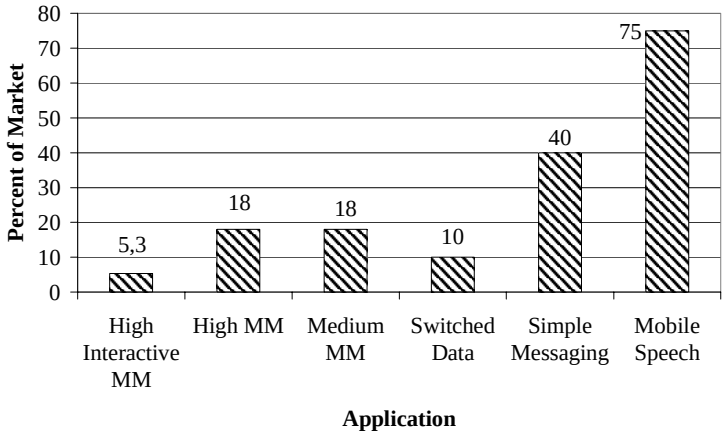

Figure 9: Common UMTS applications in 2010 [8]

6.2 Europe

The next figure predicts the estimated turnover for mobile content in Europe (including Eastern Europe) from 2002 to 2007.

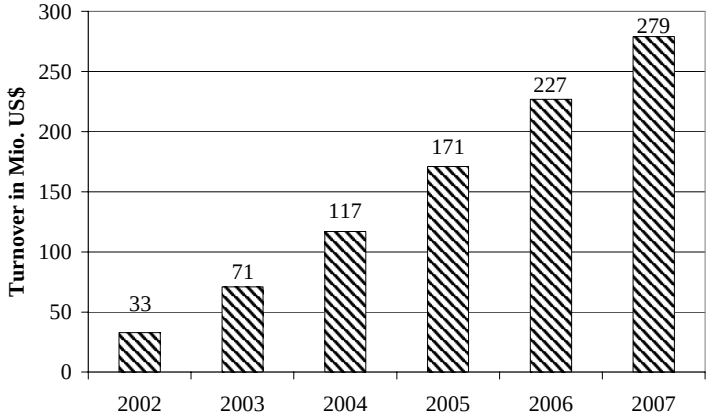

Figure 10: Turnover with Mobile Commerce in Europe [9]

6.3 Austria

Currently mobile commerce services are scarcely used in Austria and are thus generating barely any profits. It is interesting to note that content providers and hardware vendors have different market assessments. Content providers are just waiting until the technology they need, to create adequate mobile services, arrives whereas hardware vendors actively promote new standards for mobile devices. There is also a different assessment between mobile communication providers and content providers. The communication providers see the technical problems solved and are waiting for innovative contents and services to be offered. On the other hand the content providers wait for the technology to arrive to start creating mobile services. It is also interesting to note that the mobile communication providers expect content providers to pay to be able to access their networks, but content providers think they will get paid by mobile communication providers to deliver contents into their networks.

In Figure 11 Ovum sees the mobile commerce turnover in Austria steadily growing until 2006.

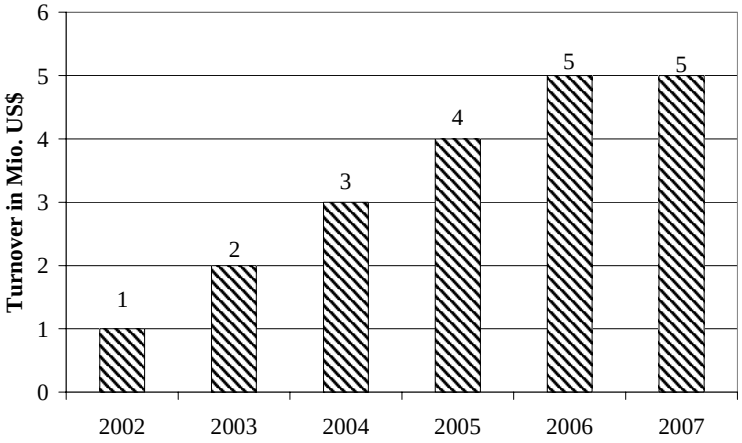

Figure 11: M-Commerce Turnover Austria [9]

According to Mobilkom Austria [1] the potential for mobile commerce in Austria is very high because of the high market penetration of mobile phone. The development of mobile commerce will follow the one of electronic commerce. The Austrian market is already saturated and therefore there is not enough revenue for six third generation mobile communication providers. One of them, Telefonica Moviles already abandoned the Austrian market. The intensive competition which is anticipated between the remaining five companies will certainly be a stimulus to offer innovative third generation mobile services for a competitive price.

6.4 Mobile Commerce Applications

Figure 12 details which mobile services are mainly used in different parts of the world. In Europe 10% of the customers use email, 11% gather news, 5% use travel services, 3% do mobile banking, 1% mobile shopping and 3% play mobile games.

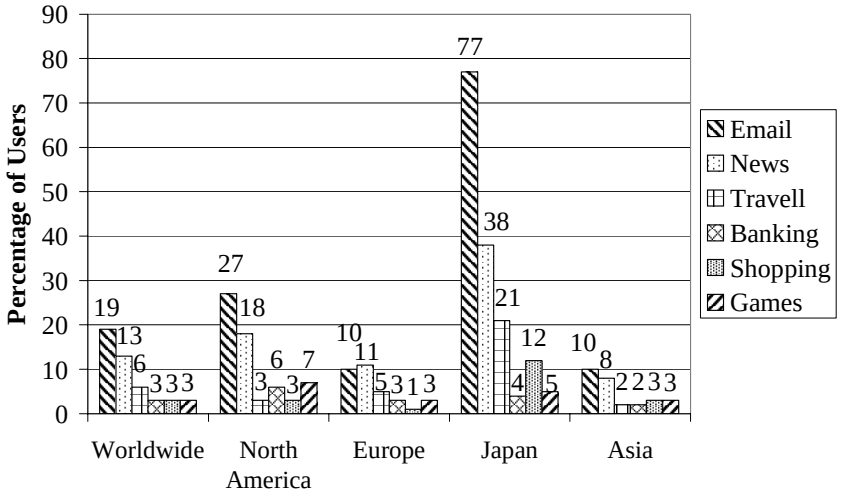

Figure 12: Usage of Internet Services through Mobile Devices [9]

The next graph shows which mobile services customers in Western Europe desire, where six is the highest and one the lowest priority. In Figure 13 it can be seen that this it quite consistent with Figure 12, which shows the used mobile services in 2002. Therefore it can be noticed that most of the services which are desired by the customers can already be used in today's second generation networks. This leaves only an advantage to third generation mobile networks when services with high bandwidth requirements are to be delivered.

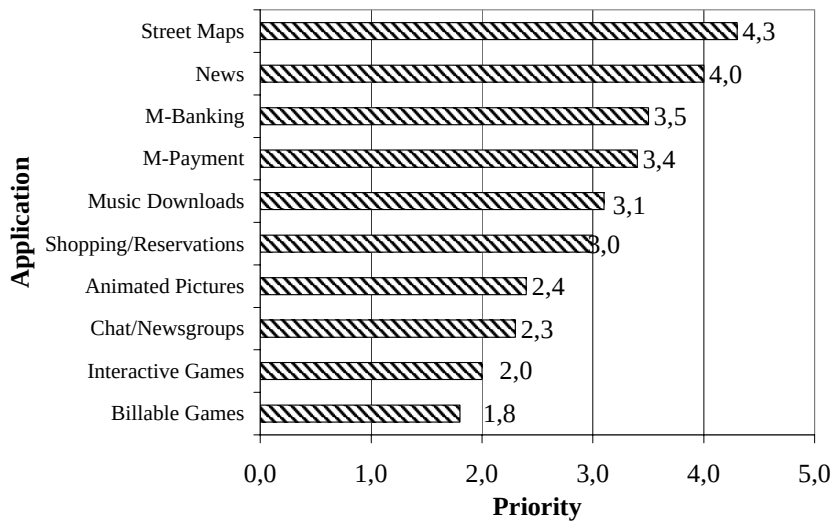

Figure 13: Desired 3G Applications by Internet Users and Mobile Phone Owners [9]

7. Conclusion and Outlook

Mobile Internet offers very promising possibilities for a broad range of business sectors. It can be seen as complementary with other upcoming trends and lifestyles and hence the increasing demands for communication that is multifunctional and location independent.

When the Internet hype reached its peak, mobile commerce was postulated to be the next logical step. Mobile commerce was expected to provide both the freedom of information brought along with the Internet and the freedom of mobility introduced by the cellular networks. The combination of these technologies was expected to be a true break-through for both Internet and communication technology. The trust in this promising vision and its related profit prospects were good enough to justify nearly every investment.

The mobile market with its large number of members involved is a very complex and changing one. At the moment we can see how a more stable structure through partnerships and co-operations is about to develop. Simultaneous companies start to see the market more realistic and also pay more attention to the customer learning curve for new technologies as well as their individual service demands. With the next generation mobile communication networks but also location based technology the necessary infrastructure for a successful deployment of mobile commerce is implemented. In the future we will see the mobile Internet successfully becoming the extension of the existing E-Commerce market.

There are now six mobile communication providers, who have established themselves in the Austrian market (Mobilkom Austria, T-Mobile, ONE, Tele.Ring, Tele2 and Hutchison). Everyone of them is now working on the new technology UMTS and everyone of them is eager to provide the newest mobile services and mobile applications to their customers such as multimedia applications, mobile shopping, ticketing etc. As mentioned in section 5 every company has its own way to differentiate itself from its competitors in the mobile communication market. They all pursue different strategies in order to reach their goals; they all have problems to bear especially with the roll-out of the UMTS technology. For example there are still problems in building up the 3G networks, the interoperability between 2G and 3G, supply and development of mobile devices as well as the specification of necessary standards and protocols.

Another interesting question that should not be ignored is the development of the content providers. With the emergence of UMTS there will be a huge potential for mobile applications that can be offered to the customers. And once successful, the mobile communication providers that stand close to the suppliers of the content will have a greater chance to improve their revenues. Again as mentioned in section 5 there are already three big companies working together with the mobile communication providers, namely ÖBB, ORF and BA/CA.

Mobilkom Austria at the moment is the most innovative company in the Austrian mobile communications market. But as Hutchison is one of the companies who are only concentrating on providing and offering UMTS technology, it will be interesting to watch how the market will develop. It can be predicted that in the end of 2003 T-Mobile and ONE will also enter the market with 3G technology. The potentials of mobile commerce are enormous and the future will show, who of the market members will be able to reap the benefits out of the possibilities and which of the mobile providers can satisfy customer needs and consequently maintain hold on the market.

References

[1] Austria Presse Argentur, 'Studien über Telekommunikation/Mobilfunk/Österreich', Publication APA 2003

[2] Brunner S., 'GSM-GPRS-UMTS', Universität Karlsruhe, 2001, http://palmpower.fzi.de/Proseminar/Ausarbeitung/Presentations/SvenBrunner_GSM-GPRS-UMTS.pdf

[3] Buse S., 'Der mobile Erfolg – Ergebnisse einer empirischen Untersuchung in ausgewählten Branchen', Universität Hamburg, 2002, http://www.homobilis.de/docs/Der%20mobile%20Erfolg.pdf

[4] Business Solutions, 'Die mobile Zukunft ist zum Greifen nah: Webpads, Tablet-PC und Co.', Press Release, Business Solutions, 2003, http://www.datakom.at/bizmail/6052.php

[5] Emedia, 'emedia – Internet, Computer, Handy – Die neuen Super-Handys', Magazine, Nr.16, 5.-18.08.2002

[6] Geer R., Gross R., 'Geschäftsmodelle für das mobile Internet – M-Commerce', Moderne Industrie-Verlag, 2001

[7] Gora W., Röttger-Gerik S., 'Handbuch M-Commerce', Springer-Verlag, 2002

[8] Graumann S., Köhne B., Kahre S., 'Monitoring Informationswirtschaft – 4.Faktenbericht 2002', Report, February 2002

[9] Graumann S., Köhne B., Kahre S., 'Monitoring Informationswirtschaft – 6.Faktenbericht 2003', Report, March 2003

[10] Hutchison, 'Hutchison Whampoa Limited – Telecommunication Introduction' Press release Hutchison, 2000, www.hutchison-whampoa.com

[11] Legend.at, 'Generation M', Press release legend.at Consulting AG Research, 2001

[12] Mobilkom Austria, 'Geschichte der Mobilkom', Press Release Mobilkom Austria, 2002, http://www.mobilkom.at/CDA/index/1,1298,NavId_255,00.html

[13] Müller-Veerse, Falk, 'Mobile Commerce Report', Publication, Durlacher Research, 2000, http://www.durlacher.com/

[14] Nicolai A.T., Petersmann T., 'Strategien im M-Commerce', Schäffer-Poeschel-Verlag, 2001

[15] One, 'One - 10 Schritte auf dem Weg zu UMTS', One Position Paper, 2002, http://presse.one.at/medienleiste/103528682224720044.rtf

[16] One, 'One - Interesse am M-Commerce', Press release, 2002, http://presse.one.at/cgi-bin/vps/artikel.pl?id=745&artikel_kategorie_id=11&sprache=de

[17] One, 'One - Neue Produkte und Services', Press release, 22.10.2002, http://presse.one.at/cgi-bin/vps/artikel.pl?id=864&artikel_kategorie_id=1&sprache=de&preview=

[18] One, 'One - Neue Struktur im Bereich Kommunikation', Press Release, 18.10.2002, http://presse.one.at/cgi-bin/vps/artikel.pl?sprache=de&artikel_kategorie_id=1

[19] Puchleitner M., Dürauer W., Dibelka F., Lindner H., 'mobile commerce report 2000', Study, legend.at Unternehmensberatung Gmbh, 2000, http://www.legend.at/xres/M-Commerce_Report_2000.pdf

[20] Statistik Austria, 'E-Commerce – Ergebnisse der Europäischen Erhebung über E-Commerce 2001/2002', Press Release der Statistik Austria, 2001, http://www.statistik.at/fachbereich_forschung/commerce_txt.shtml

[21] Steimer F.L., Maier I., Spinner M., 'mCommerce – Business and Computing', Addison-Wesley, 2001

[22] Tele 2, 'Tele2Mobil - Einfach billig telefonieren', Press Release Tele 2, 2002, http://www.tele2.at

[23] T-Mobile, 'T-Mobile – Das Unternehmen', Press Release T-Mobile, 10.10.2002, http://www.t-mobile.at/PDF/unternehmen/upraesi_20021010.pdf

[24] UMTS-Report, 'Grundlagenserie: Zellenhierarchie von UMTS – Teil3', Press Release, UMTS-Report, 22.09.2001, http://www.umts-report.com/index.php4?seite=thema&thema=27

[25] Zobel J., 'Mobile Business und M-Commerce – Die Märkte der Zukunft erobern', Hanser-Verlag, 2001