Mobile Business Start-ups in Germany
An exploration of the start-up scene and of corporate venture capital firms’ views on business success drivers and inhibitors

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Introduction
Market researchers forecast that mobile internet services in Germany will experience explosive growth and will have reached thirteen billion Euro in revenues by 2005 (EITO 2002, p. 237). Established companies both from the telecommunications and from related information technology, e-business or media industries address this market. In addition, companies from many other industries embrace m-business as a means to increase their operational efficiency or to enhance their online media presence by the possibilities of mobile data access.

To date, about fifty m-business start-ups are operating in Germany and take on the challenge of competing with established companies. Reflecting the characteristics of the mobile industry, we analyse drivers and inhibitors of the mid-term success potential of these start-ups and address three main questions:

■ To what extent are m-business start-ups active in Germany and what business models do they pursue?
■ What factors seem to be critical for the success potential of m-business start-ups?
■ How do critical success factors of m-business start-ups vary between different pursued business models?

The article first provides a description of different business models pursued by m-business start-ups. Second, we review the notion of critical factors driving or inhibiting new venture success in the entrepreneurial research literature as a conceptual anchor for our own exploratory work. Third, we interpret the impact of environmental variables on the mid-term success potential of m-business start-ups. We then analyse internal success factors regarding m-business start-ups in general and specific business models in particular. Lastly, we propose initial hypotheses on internal success factors based on our exploratory analysis.

M-business start-ups: definition and business models
The term mobile business is frequently used with varying meanings. We define mobile business, in short m-business, as the use of data- or multimedia-services (apart from sheer bi-directional

Abstract
The purpose of the article is to provide a first exploration of success drivers and inhibitors of mobile business start-ups in Germany. Based on this objective we reviewed various written sources and interviewed specialised venture capital managers. This led to the identification of about 50 m-business start-ups in Germany. Most of these new ventures address business rather than residential customers. Our preliminary analysis suggested nine general hypotheses on internal success factors likely to be of particular importance for m-business start-ups. Among these factors were the pursuance of a focused differentiation and pioneering market entry strategy or the ability to adapt services to the variety of mobile devices in the market. Young m-business ventures follow different business models (e.g. application infrastructure provision, application service provision or mobile portal operation), which possess model-specific success drivers or inhibitors. Further, more long-term research with larger samples is needed to validate and to specify the article’s rather general hypotheses on success factors of German m-business ventures.

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voice-services) in public mobile telecommunications networks

- in order to prepare, agree and/or realise business transactions
- between market players such as companies or public institutions (B2B-market), within companies or public institutions (intra-organisational market) or between companies or public institutions and mobile subscribers (B2C-market) (Gerpott 2002, p. 51).

From this definition follows that mobile business start-ups can be characterised as companies that meet the following criteria (Nicolai & Petersmann 2002, pp. 99-100):

- The founding of the start-up was motivated by perceived opportunities in the m-business arena. e-commerce start-ups such as Yahoo! or eBay, that enhanced their service portfolio by m-business services or that added the possibility of accessing their services via the mobile channel, are therefore not classified as m-business start-ups;
- the majority of the company’s equity is not held by an established shareholder so that subsidiaries of larger diversified corporations are excluded from our definition;
- the company was founded not more than eight years ago, which is the age limit for new ventures used by authors such as Biggadike (1979) or Miller and Camp (1985) to distinguish ‘new’ from more established ventures.

The mobile data communications value chain as illustrated in figure 1 serves as a starting point to further differentiate various types of m-business start-ups.

While start-ups are active in each of the depicted value chain segments to varying extents (Borowicz & Scherm 2002, p. 67), our analysis focuses on start-ups that are active in the value chain segments

- application infrastructure provision and application development,
- application service provision,
- mobile portal operation
- and mobile payment provision.

While content provisioning would fit our definition of m-business, we were not able to identify any single start-up that only focuses on generating, syndicating or aggregating content. Therefore, we refrained from any further analysis of the potential m-business start-up category ‘content provision’. This role is rather taken by established media companies such as Bertelsmann. Information service providers and others acquire content from such content providers in order to further market it, but they do not create own content or do so only to a quite limited extent (Hess & Rawolle 2001, pp. 667-8).

In accordance with our focus on start-ups that are active in the four value chain segments listed above, we propose four business model categories by using the addressed value chain segment as our categorisation criteria. The business model of an individual start-up is a broader concept which encompasses all key aspects of how a company operates, including its market positioning, product portfolio, pricing strategy, the company’s structural business set-up and other key business aspects. By categorising the business models along the value chain we implicitly assume that similar success factors are valid for start-ups that address the same value chain segment and that offer similar services. As the offered services vary widely within two of our suggested business model categories, we have formed sub-categories in these segments that group companies with similar service portfolios. The categories and a brief description of each are summarised in figure 2.

These categories provide us with a structure according to which we assign each identified start-up to its relevant class. As a next step, we analyse potential success factor variations, which is conducted in the section “success factor variations by business model”.

Critical success factors of m-business start-ups: Overview

Under the heading of ‘critical success factors’, significant drivers and inhibitors of a corporation’s well-being are a popular topic of both management scholars and practitioners. Following Leidecker and Bruno (1984, p. 24), ‘critical success factors are those characteristics, conditions, or variables that, when properly sustained, maintained, or managed can have a significant impact on the success of a firm.’ The relative importance of a success factor depends on a company’s market environment and therefore needs to be interpreted in a situational context (Mulzer 1999, p. 32).

Critical success factors can be categorised into external factors, which are beyond management control (e.g., capital market conditions), and internal factors, which are directly affected by management actions (e.g., the composition of the management team). Klandt, Kirchoff-Kestel and Struck (1998, p. 39) and Mulzer (1999, pp. 5-14) for example provide overviews of perceived critical success factors for start-ups in general. We suggest differentiating two external and four internal critical success factor dimensions for m-business start-ups as summarised in figure 3.

The history of m-business start-ups is too short to assess correlations between potential success factors and long-term performance measures such as company survival, employee growth or profitability rates. Furthermore, since there are currently only about fifty m-business start-ups operating in Germany, the sample size is too small to allow for rigorous multivariate statistical testing for correlations between success factors and quantitative success measures.

Therefore, we took a different approach to explore potential success drivers and inhibitors of m-business start-ups quali-
Figure 1: Mobile data communications value chain

Network Infrastructure Supply/Mobile Device Supply → Network Operation/Information Transport → Application Infrastructure Provision/Application Development → Application Service Provision → Mobile Portal Operation → Mobile Payment Provision → Customer Acquisition/Management → Mobile Subscriber

Note: This article focuses on start-ups in the segments with grey shadings

Source: Adapted from Gerpott 2002, p. 60

Figure 2: Business model categories and sub-categories of m-business start-ups

Application Infrastructure Providers/Application Developers:
Application platform providers/application developers: Provide IT-platforms on which applications are run or develop applications which they then market to network operators or to application service providers.
Application intermediaries: Provide services such as application hosting or gateways.
Enablers/integrators: Offer IT-integration, consulting and other services that support companies in realising m-business solutions.

Application Service Providers:
Information application providers: Market information services such as news, weather or traffic information to mobile subscribers directly or to mobile portals.
Mobile entertainment application providers: Develop and market m-entertainment applications such as games, gambling or betting services to mobile subscribers directly or to mobile portals.
Mobile advertising application providers: Offer services to companies across various industries which share the intention to distribute advertising messages to mobile subscribers.
Inter- and intraorganisational business application providers: Offer services that aim at increasing the efficiency of business processes.

Mobile Portal Operators:
Enable payments via mobile phones by providing transaction services and the necessary security procedures.

Mobile Payment Providers:
Enable payments via mobile phones by providing transaction services and the necessary security procedures.

Figure 3: External and internal critical success factor dimensions for m-business start-ups

<table>
<thead>
<tr>
<th>Macro-economic environment</th>
<th>Industry attractiveness</th>
<th>Financing</th>
<th>Competitive strategy</th>
<th>Management skills</th>
<th>Organisational set-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business climate</td>
<td>Market size and growth</td>
<td>Stake/Shareholder structure</td>
<td>Focal customers (niche versus mass market)</td>
<td>Business location</td>
<td>Skill-set of entrepreneur(s)</td>
</tr>
<tr>
<td>Capital market conditions</td>
<td>Sub-market size and growth</td>
<td>Extent of product differentiation</td>
<td>Legal form</td>
<td>Complementary skills among managing team</td>
<td></td>
</tr>
<tr>
<td>Availability of venture capital</td>
<td>Entry and exit barriers</td>
<td>Market entry timing</td>
<td>Organisational form</td>
<td>Efficiency of team work</td>
<td></td>
</tr>
<tr>
<td>Availability of publicly funded capital</td>
<td>Number and capabilities of competitors</td>
<td>Scalability and flexibility of the business concept</td>
<td>Use of external support</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

External success factors

Internal success factors
tatively. First, we conducted an internet research on m-business start-ups and reviewed business press publications on m-business start-ups in Germany. With that information we assigned each start-up to one of the four business models differentiated in figure 2. Second, we conducted face-to-face interviews. In these interviews, we surveyed the individual perception of three experts on success factors of m-business start-ups. The three experts interviewed were the CEO of Siemens Mobile Acceleration, the CEO of Holtzbrinck networmXs and an investment manager at the T-Venture T-Telematik Venture Holding. Each of these corporate venture capital firms has invested in several m-business start-ups. These interviews serve as a foundation for developing initial hypotheses on m-business start-up success factors, which may serve as a starting point for future empirical validation. Third, the interview findings were validated by our review of recent scholarly German or Anglo-Saxon literature on m-business, entrepreneurship and venture capital.

**External critical success factors**

**Macro-economic environment**

The growth of the German economy has slowed down significantly since 2000. More importantly, venture capital investments in communication technology start-ups have significantly decreased and, for example, reduced by more than half from 203 million Euro to 97 million Euro between the second half of 2001 and the first half of 2002 (BVK 2002a, p. 20; BVK 2002b, p. 3).

Lower availability of venture capital has therefore become a bottleneck for both new m-business start-up foundations and for the growth of existing start-ups. Lower availability of venture capital has therefore become a bottleneck for both new m-business start-up foundations and for the growth of existing start-ups.

**Industry attractiveness**

**Market demand**

At the end of 2001, there were 56.2 million mobile subscribers in Germany. Nine months later, this figure has decreased to 54.5 million (Informa Telecoms Group 2002, p. 7), indicating that the overall mobile market’s attractiveness is not improving. Nevertheless, data usage of the remaining subscribers is growing. M-business encompasses a range of new data services that may be increasingly adopted, which leads to positive m-business growth expectations. As shown in table 1, content and services are expected to be the largest mobile data revenue driver, followed by traffic revenues and fees paid by third parties. However, there is still high uncertainty in the market about how these revenues are actually going to be achieved. The actual mobile internet revenues may therefore well be lower and be realised later than expected (Buse 2002, p. 100).

**Competitive intensity**

M-business start-ups interact with mobile operators either in a supplier-customer or in a co-vendor relationship. Due to their dominant position in the mobile data communications value chain in Germany, mobile operators are the key competitors of German m-business start-ups (Nicolai & Petersmann 2001, p. 38). Their competitive position has become even stronger, as two out of the six German UMTS-licensees, Quam and MobilCom, have discontinued or are about to discontinue their UMTS-network roll-out. Another factor that may further increase competitive pressure from German mobile operators is their incentive to exploit opportunities from m-business on their own. This could help them to reduce their high debt levels, if m-business turns out to be a market with relatively short breakeven cycles.

The second cluster of competitors to m-business start-ups consists of other established companies particularly from the information technology and media industries that continue to converge with the telecommunications industry (Gerpott 2003a). Both established and start-up e-business companies are especially expanding their business models into the m-business arena (Göbel & Molfenter 2001, pp. 222-3).

The third competitive cluster is formed by m-business start-ups worldwide, of which Zobel (2001a, p. 19) had already identified about 500 in the year 2000.

The combined effects of the lower than expected adoption of GSM/GPRS-based data services, delays of the planned launch of UMTS-services, high competitive intensity and the decreasing venture capital investments have resulted in a downturn in the founding activity of m-business start-ups. In fact, the latter had almost come to a halt by mid-2001, as indicated in figure 4.

Table 1: Forecast of mobile internet revenues in Germany (in million Euro)

<table>
<thead>
<tr>
<th>Type of service</th>
<th>2003</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data access and traffic</td>
<td>930</td>
<td>3,478</td>
</tr>
<tr>
<td>Content and services</td>
<td>3,497</td>
<td>7,563</td>
</tr>
<tr>
<td>Third party fees</td>
<td>225</td>
<td>1,717</td>
</tr>
<tr>
<td>Total</td>
<td>4,652</td>
<td>12,758</td>
</tr>
</tbody>
</table>

Source: EITO 2002, p. 237

After mid-2001, not one single new German m-business start-up was founded with 51 m-business start-ups operating in Germany in September 2002 according to our research. This figure is lower than the 59 m-business start-ups reported by Nicolai and Petersmann (2002, p. 101) since several insolvencies and other market exits had
taken place since their assessment in mid-2001. As suggested by our interviewees, the number of future insolvencies among m-business start-ups is likely to decrease as many players with unsustainable business strategies no longer exist. Clearly though, if the expected m-business market does not become a reality to the expected extent or within the expected time frame, many of the remaining m-business start-ups are unlikely to survive.

The founding rate of m-business start-ups may receive a new boost once UMTS-services are launched (Göbel & Molfenter 2001, p. 224). A large number of entrepreneurs are still willing to enter the m-business market as venture capital firms continue to receive hundreds of requests for investment in potential m-business start-ups, according to our interviewees. However, each step of the mobile data communications value chain is already being addressed by established or by start-up companies. Therefore, new start-ups have to outperform competitors either through differentiation or through cost advantages. Only one of our three interviewees was therefore convinced that the launch of UMTS networks would lead to significant new m-business start-up founding activities in Germany.

**Internal critical success factors**

**Financing**

In their survey of new venture performance, Cooper, Gimeno-Gascon and Woo (1994, p. 391) found that start-ups with larger funds available upon their founding have higher success potential in a mid-term perspective so that funds availability for m-business start-ups is a crucial determinant of their future success. During the pre-founding phase, m-business start-ups depend on their own funds or equity injections provided by friends, business angels or venture capital firms as they cannot provide the securities needed to obtain debt financing (Mellewigt & Witt 2002, p. 97). In the start-up phase, venture capital remains the major equity source and is particularly important for m-business start-ups in Germany as they rarely obtain publicly subsidised loans or equity, according to our assessment. As new m-business ventures approach the end of their start-up phase, they must have proven their ability to attract customers. Otherwise they are likely to be unable to conclude a second or third financing round especially in the current tighter venture capital market.

In conclusion, the substantial decrease of venture capital investments into communication technology start-ups has become a bottleneck for m-business start-ups, as these are, on average, financed to 48 per cent by venture capital (Nicolai & Petersmann 2002, p. 103). Thus, the ability to attract a first financing round has become an increasingly important success factor.

**Competitive strategy**

**General competitive strategy variables**

We raised the question which competitive strategy – i.e., whether an industry-wide differentiation, an industry-wide cost-leadership strategy, a focussed differentiation or a focussed cost-leader-
ship strategy – is most promising for m-business start-ups. The interviews yielded that all interviewees strongly opted for a focussed strategy. They suggested that m-business start-ups are more likely to succeed if they concentrate on developing and marketing just one group of services. In the same context, they suggested that m-business start-ups should target a single rather than multiple market segments. The generally limited financial resources of m-business start-ups are a further argument as to why m-business start-ups should pursue a focussed rather than an industry-wide competitive strategy. This result is also supported by findings of Mellewigt and Witt for start-ups in general (2002, pp. 94-5). Within a focussed strategy, start-ups can try to differentiate themselves from competitors, to achieve cost-leadership or both. In the m-business market arena with its high innovation dynamics, m-business start-ups regularly seek to differentiate their services from others rather than to pursue a pure cost-leadership approach, which may, in addition, strain the start-ups’ already limited financial resources. This pure cost-leadership approach may become more important when the m-business market matures. For m-business start-ups it seems therefore advisable to pursue a focussed differentiation strategy.

As they continue work on developing the services that they intend to market in the long run. Our interviewees concluded that a pioneer market entry strategy of m-business start-ups is likely to be more successful than a follower strategy if the pioneer can maintain its innovation lead and if he can be the first to establish relationships to important clients. A survey conducted by Hartenstein (2001) among experts on the performance of new economy start-ups came to the same conclusion.

Flexibility and scalability of the business concept of m-business start-ups were also rated as important drivers of m-business start-ups’ success potential by the interviewees. M-business start-ups must be able to flexibly adapt their services to rapid technology changes or market delays, such as new service launches (e.g. multimedia messaging), new micro-browser standards (e.g. cHTML used by i-mode or WML used by WAP-phones) or delays in the planned launch of UMTS-networks. If the services of m-business start-ups meet market demand, both their IT-infrastructure (e.g. databases, application platforms or billing processes) and their organisational set-up need to be highly scalable, as they address a mass market potential of millions of mobile subscribers either directly or via mobile operators as their clients.

Asked about market entry timing, the interviewees stressed the importance of meeting a strategic window of opportunity. High innovation dynamics in the mobile market and short product life cycles however make this quite difficult for start-ups (Clement 2002, p. 27). In order to increase the chances to meet a window of opportunity and to quickly generate first revenues, the interviewees further pointed out that m-business start-ups should keep the time to market low. They should therefore ensure that they develop services with which they can quickly reach first sales or that they also market services that can quickly generate first sales while they continue work on developing the services that they intend to market in the long run. Our interviewees concluded that a pioneer market entry strategy of m-business start-ups is likely to be more successful than a follower strategy if the pioneer can maintain its innovation lead and if he can be the first to establish relationships to important clients. A survey conducted by Hartenstein (2001) among experts on the performance of new economy start-ups came to the same conclusion.

From a partnership perspective, the ability of a start-up to enter a close relationship to mobile operators or to their associated mobile portals was considered by the interviewees to be of considerable importance for its likeliness of succeeding. In most cases, m-business start-ups must attain a close co-operation or at least some type of a ‘lead-user relationship’ with mobile network operators. At the same time, however, many m-business start-ups compete with mobile network operators for the same clients and revenue streams. Thus, a key challenge for m-business start-ups is finding an optimal level of ‘coop-petition’ when interacting with mobile operators (Gerpott 2001, p. 221). Taking into account that German mobile operators have the power to negotiate contractual agreements to their favour because of their control of bottleneck resources in the mobile data communications value chain, the relational quality that an m-business start-up can establish with one or several operators is of particular importance. Therefore, those m-business start-ups which pursue a business model allowing them to by-pass mobile operators (e.g. mobile marketing service providers) may be particularly successful.
Success factor variations by business model

As a prerequisite to identify success factors by business model category we assigned each of the identified 51 m-business start-ups with operations in Germany to one of the four business models and to their respective sub-categories that were illustrated in figure 2. Our assignment procedure included three steps:

- We analysed company homepages in order to identify the primary service focus of the start-up. If the service portfolio included services that would need to be assigned to separate categories, we analysed the online information available about the service offers, company statements, press releases and similar information in detail to reach a thorough qualitative impression of the start-up’s service focus. It proved hardest to distinguish between the sub-categories ‘application platform providers’ and ‘inter- and intraorganisational business application providers’, as many application platform providers also offer intra- and intraorganisational business applications and vice versa. Here, the category distinction is weakest. Where in doubt about which category a certain service was to be allotted to, we assigned the start-up to the broader sub-category ‘application platform providers’;

- In some cases, we reviewed additional business press articles and conducted phone interviews with two m-business experts;

- Lastly, we performed a consistency check by comparing the relative distribution of m-business start-ups in our categories with results stemming from the assessment of German m-business start-ups by Nicolai and Petersmann (2002, p. 102). Their relative distribution along the categories ‘enabler’ (66%), ‘application service provider’ (23%) and ‘portal operators’ (12%) is roughly in line with ours, especially considering that they have most likely used a broader definition of the business model category ‘enabler’. We assume that they included some or all of the ‘inter- and intraorganisational business application providers’ into their ‘enabler’ category. Further differences may be explained by market exits of several start-ups that occurred since their assessment and before ours.

To sum, our categorisation is based on qualitative information. While we have taken due care, our categorisation therefore still is far from being perfect. However, a categorisation using quantitative measures such as relative revenue contribution was not possible since such information is not publicly available for many m-business start-ups.

The results presented in figure 5 suggest that over four out of five start-ups chose to position themselves as an ‘application infrastructure provider’ or as an ‘application service provider’. M-business start-ups therefore seem to focus on the ‘downstream end’ of the mobile data communications value chain.

Only 10 of the identified m-business start-ups in the categories information application provider, mobile portal operator or mobile payment provider directly target mobile subscribers as their clients. The high share of m-business start-ups that address business customers suggests that entrepreneurs and the investment community currently tend to believe that B2B-oriented m-business start-ups are more likely to perform well than B2C-oriented start-ups. The fact that most of the latter have strong partnerships with established companies suggests that such a partnership is a key success prerequisite for B2C-oriented m-business start-ups. Such a partnership improves the chances of reaching a sufficient number of mobile subscribers, i.e. to address a mass market that is difficult to reach by a start-up on its own due to its limited resources (Nicolai & Petersmann 2002, p. 107).

Application infrastructure providers

55 per cent of German m-business start-ups pursue the application infrastructure provider business model. Given that, according to our research, just one start-up in this category went bankrupt, there is some reason to suggest that start-ups in this category are in a situation which provides them with a reasonable mid-term time frame to prove that this business concept is sustainable.

A closer look at application infrastructure providers reveals that there are three business model subtypes within this group (Kalakota & Robinson 2001, pp. 61-71):

- Application platform providers market platform middleware such as m-commerce, content or location-based service platforms to mobile operators, to application service providers or to other companies. Application developers programme applications upon request from mobile operators, application service providers or from device manufactures who embed the applications into their mobile devices. Most application platform providers also develop applications and vice versa, so that we have included both types into one sub-category

- Application intermediaries market services such as application hosting or gateways. Gateway operators offer network-independent gateways, e.g. for SMS, MMS (multimedia messaging service) or for WAP-traffic. Operators use independent gateway providers to increase the capacity, flexibility and redundancy in their networks. For instance, OpenMobile Germany is a start-up that operates an international SMS-gateway. Oper-
ators that use this service by-pass the necessity to set-up bilateral SMS-exchange agreements with operators in a variety of foreign countries on their own.

- Enablers offer system integration, m-business consulting or other services that aim at providing support in the realisation of applications or of application infrastructure.

Application platforms are systemic goods with indirect network effects. The value for the customer and as a consequence the speed of diffusion in the market of the offered platforms therefore positively correlate with the number of platform users (Gerpott 2003b). The larger the customer and application base of a platform provider the lower the platform development costs per application are – leaving room for providing customers with lower prices. Hence, m-business application platform providers should strive to ensure that a sufficient number of companies develop applications running on their platforms. This reasoning provides additional support for suggesting that a pioneer strategy is likely to be more successful than a follower strategy, particularly for application platform providers (Mellewigt & Witt 2002, p. 93).

While application infrastructure intermediaries largely face the same challenges as application platform providers, application infrastructure enablers need to find niches to be able to successfully compete with established companies such as Accenture who also offer enabling services such as consulting or system integration.

Application service providers

31 per cent of German m-business start-ups mainly provide applications in one or several B2C- or B2B-oriented m-business service categories. Following m-business service segmentations published in research literature (e.g. Gerpott 2002, pp. 53-60; May 2001, pp. 90-139) we suggest to distinguish three subtypes of application service providers whose applications primarily address mobile subscribers as private consumers, i.e. information, entertainment and mobile marketing applications. We distinguish a fourth application service provider subtype which addresses the mobile data communication needs of companies.

Consumer information application providers

Companies in this sub-category provide information such as news or weather forecasts that they usually have bought from content providers. However, subscribers are unlikely to pay substantial fees for content that is available for free via other media (Gerpott 2003c).
Therefore, many information providers try to increase customer value by offering location-based, personalised or otherwise enhanced content that specifically addresses the situational context of the targeted mobile subscriber. However, even for contextualised content considerable doubts remain whether m-business start-ups will be able to generate sufficient revenue. Market research and the slow growth of information service revenues generated by the i-mode portal of E-Plus (the third German mobile operator) indicate that subscribers are in most cases unwilling to pay additional fees even for contextualised information services. Therefore, information service providers need to gain a share of the traffic revenues generated by the usage of their services, which German mobile operators however mostly refuse. Rather, they tend to buy, contextualise and market information content on their own since they already have the billing relationship to subscribers and since they control the data on the subscribers’ location (Zobel 2001a, pp. 213-4).

Summing up, the success of m-business start-ups operating in the role of an information application provider largely depends on whether they control unique content which mobile subscribers are willing to pay for or which generates communication traffic in such large quantities that mobile operators are willing to share an attractive part of the generated traffic revenues.

Entertainment application providers

Entertainment application providers such as FirstM and Scaraboo address a market segment characterised by very positive revenue growth forecasts. For instance, as shown in table 2, EITO expects that m-entertainment revenues will have reached over three billion Euro in Germany by 2005, with games expected to become the most significant entertainment service type.

However, German m-business start-ups offering m-gaming face strong competition from both established electronic games producers and from m-entertainment start-ups in other countries such as, for example, Code Toys in Finland. The critical factors to succeed in this competitive environment are creativity in developing new gaming ideas and process efficiency in transforming the ideas into software versions running on a variety of devices.

Mobile marketing application providers

Mobile marketing application providers offer services to companies across various industries sharing the intention of distributing advertising communication messages to mobile subscribers. Among possible mobile marketing forms, permission-based, targeted advertising messages are likely to be one of the most successful mobile advertising forms in Germany (Schwarz 2002, p. 291). Mobile marketing application providers by-pass mobile operators in that they do not need to enter revenue sharing agreements with them. Instead, they charge their client companies directly.

A key success driver of mobile marketing application start-ups is their ability to attract a sufficiently high number of profiles of subscribers who give their permission of being sent mobile advertising messages. Many mobile marketing application providers such as, for example, MindMatics therefore grant monetary incentives in order to attract subscribers willing to receive advertising messages (Hinrichs & Lippert 2002, p. 269).

Inter- and intraorganisational business application providers

Inter- and intraorganisational business application providers enable companies to improve the efficiency of intra- and inter-company collaborative work processes by using mobile data communication solutions. Due to this potential efficiency increase, businesses show a certain ‘willingness to pay’ for such m-business services (Zobel 2001b, p. 153).

This m-business start-up category is rather similar to the before-mentioned start-up category ‘application infrastructure provision’, as inter- and intraorganisational business application providers also need to integrate platforms, such as mobile e-mail servers, into the client company’s IT-landscape. Therefore, several m-business start-ups that we assigned to the category ‘application platform provision’ offer inter- and intraorganisational business applications in addition to marketing their platforms.

Mobile portal operators

Mobile portals such as Jamba! provide end consumers with information, entertainment and other services that are accessible in a single virtual place, i.e. via the portal site (Durlacher 2001, p. 46). These portals are usually accessible via both mobile devices and fixed internet access. Therefore, mobile

<table>
<thead>
<tr>
<th>Type of m-entertainment service</th>
<th>2003</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gambling</td>
<td>20</td>
<td>202</td>
</tr>
<tr>
<td>Games</td>
<td>95</td>
<td>1,014</td>
</tr>
<tr>
<td>Video and audio</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Ringtones and cell phone icons</td>
<td>534</td>
<td>938</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>966</td>
</tr>
<tr>
<td>Total</td>
<td>656</td>
<td>3,220</td>
</tr>
</tbody>
</table>

Source: EITO 2002, p. 238
portal operators need to be capable of integrating different IT-systems, i.e. for both mobile and fixed access.

The key success driver of mobile portals is the number and quality of the visitors they can attract to their site. Mobile operators therefore pre-configure the handsets distributed via their associated distribution channels to their own mobile portal. A critical success driver for m-business start-ups that operate mobile portals is therefore their ability to enter partnerships with established corporations with strong mass-market distribution channels. For instance, Jamba! partnered with two powerful distributors (debitel, Mediamarkt/Saturn), that push handsets pre-configured to the Jamba! portal into the market (Samwer 2001, pp. 253-4).

Mobile payment application providers

This business model is pursued by only one German m-business start-up. Therefore, we were unable to provide a sufficient amount of empirical material to analyse success factors for this business model. Nevertheless, it is evident that the ‘installed base’ both on the consumer/buyer and the business/seller side of the mobile market is the key success driver for mobile payment application providers. If the diffusion pattern of another non-cash payment solution, namely credit cards, also holds true in the m-payment market, it follows that it will take years for mobile payment providers to gain wide acceptance of their service. Hence, a strong financial position helping a payment provider to stay in business during the early years should be considered a prerequisite to succeed as a mobile payment provider (Entenmann 2001, pp. 271-2).

Entrepreneur and management team

The qualification of the individual entrepreneur, or of the entrepreneurial team is a pivotal long-term success driver for new ventures. Earlier work of Mellewigt and Witt (2002) or of Hartenstein (2001) suggests that start-ups founded by teams have a higher success potential and that the degree to which the team members’ skill-sets complement each other is positively related to the success of new economy start-ups. According to our assessment, the team-founding rate among German m-business start-ups is rather at the higher end of the team founding rate spectrum of German technology-oriented start-ups of 38 to 67 per cent that was identified in a meta-analysis of empirical studies of German start-ups conducted by Mellewigt and Witt (2002, p. 95). In addition to complementary technology (e.g. information technology, network technology), commercial and general management skill-sets (Durlacher 2001, p. 39), management teams of m-business start-ups also need in-depth industry experience. This is another critical success factor for start-ups, which was identified in a survey by Cooper, Gimeno-Gascon and Woo (1994, p. 390).

Organisational set-up

Our interviewees rated organisational set-up variables such as office location, flexibility of office space expansion, functional versus product-related organisational structure or use of support from non-commercial sources such as public incubator institutions as having little impact on the success of m-business ventures. A moderate importance was attributed to the appropriate legal form of a start-up. The only organisational set-up characteristic that the interviewees believed to have a substantial impact on the success potential of m-business start-ups is the amount of external support that start-ups receive from the venture capital firms that invested in them. This is in line with findings of Schefczyk and Gerpott (2001) who identified a significant positive correlation between the intensity of management support that a start-up received from venture capitalist firms and the performance of new ventures.

Discussion

Our analysis of the German m-business start-up scene provides a view on the future development of m-business start-ups in Germany and on their chosen segment focus. Furthermore, our analysis suggests initial hypotheses on key success factors for m-business start-ups in general and preliminary conclusions on specific success drivers for different business model categories of m-business start-ups.

First, the number of 51 m-business start-ups in Germany identified by us is quite small, which may in part be explained by the lower than expected growth of the m-business market and by the competition from established companies. To wit, mobile operators have a dominating position in the mobile data value chain and enhance their service portfolio by m-business services which they develop partly on their own, partly in cooperation with partners. When partnering, the operators are likely to prefer teaming up with established rather than with start-up companies for reasons of risk reduction. Mobile operators may be uncertain whether a m-business start-up will actually survive in the medium to long term. Media companies entering the m-business market form a third cluster of companies competing in the m-business market. Due to this fierce competition and to the strong position of German mobile operators in the mobile value chain, it is likely that mobile operators and other established companies will grasp the largest share of value created in the m-business market.

Second, the start-up foundation rate declined after mid-2001. Whether a new wave of m-business start-ups will take place once UMTS-services have been launched is far from certain. New start-ups may benefit from substantially
## Figure 6: Summary of our findings for nine key internal success factors for m-business start-ups

<table>
<thead>
<tr>
<th>Critical Success Factor</th>
<th>Exemplary supporting arguments and literature</th>
<th>Exemplary opposing arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to attract venture capital</td>
<td>The less venture capital firms invest into communication technology start-ups, the more the successful attraction of venture capital becomes a differentiator and therefore a critical success factor (Cooper et al. 1994)</td>
<td>Promising business models receive venture capital also in baisse markets</td>
</tr>
<tr>
<td>Pursuance of a focussed market entry strategy (one product group, one targeted market segment)</td>
<td>Most m-business start-ups focus on one or few product groups and on one client segment. Focussed start-ups are likely to need less time-to-market and can hence generate first revenues faster. Limited resources of start-up companies require a focussed strategy</td>
<td>Focussed start-ups may miss attractive market opportunities</td>
</tr>
<tr>
<td>Business Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scalability and flexibility of the business model (IT-platforms, organisational set-up, ...)</td>
<td>High market dynamics and technology innovation rates require the ability to flexibly adapt the business model and service portfolio. The business model needs to be highly scalable due to uncertain market potential. Hartenstein’s (2001) survey on new economy start-ups supports the higher success probability of a pioneer market entry strategy</td>
<td>The advantages of scalability and flexibility are offset by associated costs</td>
</tr>
<tr>
<td>Ability to prevent imitation of the business model</td>
<td>Measures that hinder imitation increase market entry barriers and hence lower competitive intensity. To a certain extent, intellectual property rights can prevent imitation</td>
<td>Even intellectual property rights provide only limited protection</td>
</tr>
<tr>
<td>Ability to adopt applications to the variety of mobile devices</td>
<td>Ensuring the adoption of applications to different mobile devices is a challenge for all m-business start-up clusters, as application services need to run on a wide variety of mobile devices and as application platforms need to provide the necessary processes to adapt applications to the specifics of the receiving mobile device</td>
<td>Adoption costs</td>
</tr>
<tr>
<td>Quality of the relationship to mobile operators (depends on the start-ups business model)</td>
<td>Due to the strong position of mobile operators in the value chain, m-business start-ups need to ensure that they build a good relationship with them. However, mobile operators can still negotiate contractual agreements to their favour. Therefore, those m-business start-ups pursuing a business model that allows to by-pass mobile operators (e.g. mobile marketing service providers) may be particularly successful</td>
<td>Attractive services may be adopted by mobile operators regardless of the relationship quality. German operators may offer attractive revenue sharing agreements more readily in the future</td>
</tr>
<tr>
<td>Complementary skill-set among the managing team (e.g. technical skills and industry expertise)</td>
<td>High technological innovation and market dynamics require management teams that combine IT- and business administration skills with in-depth industry experience. Most successful start-ups have teams with complementary skill-sets (Mellewigt &amp; Witt 2002) and with extensive industry experience (Cooper et al. 1994)</td>
<td>Lacking skills among teams that have been recruited among the same social background may be partly offset by higher interaction quality among the team</td>
</tr>
<tr>
<td>Extent of external support by venture capital managers</td>
<td>Advise on financial, managerial and functional aspects by venture capital firms is positively correlated to start-up performance (Schefczyk &amp; Gerpott 2001)</td>
<td>Venture capital managers often lack the time to provide extensive management support</td>
</tr>
</tbody>
</table>
higher demand but they also may face significant competition from companies already present in the market. In addition, new m-business start-ups may find it difficult to attract venture capital in the face of decreased venture capital investments in communication technology start-ups. The success of the m-business start-ups already operating in the market certainly depends to a large extent on how fast the expected growth in m-business demand will actually become a reality.

Third, most m-business start-ups in Germany sell products and services to other corporations operating within or outside the telecommunications market. We suspect that an important reason for this B2B focus is that it leaves start-ups with some room to operate independently and that their value proposition centers on increasing the process efficiency of their client companies, for which the latter show a certain ‘willingness to pay’. In contrast to this, the economic fate of many start-ups in the B2C m-business market heavily depends on revenue sharing/billing partnerships with mobile network operators or with other players who control a strong distribution network and brand.

Among the internal critical success factors discussed in the article, our findings lead us to state nine initial hypotheses on internal critical success factors for m-business start-ups. These initial hypotheses were also judged as being particularly important by our interviewees. They are summarised in figure 6. As also shown in this figure, a number of opposing arguments to our hypotheses can be put forward. In addition, our analysis builds on only a small number of conducted interviews and is of an exploratory nature. Further research is therefore required exploring whether our hypotheses will hold true in larger m-business samples from various countries.

While our proposed hypotheses on internal success factors should be valid for m-business start-ups in general to varying degrees, some peculiar success drivers seem to apply for each of the analysed business model categories and sub-categories proposed by us. For instance, application platform providers as the largest identified category of m-business start-ups need to attract a sufficiently high number of application developers or businesses that make use of the offered application platforms in order to realise network effects necessary to justify the platform’s development costs. Future studies are needed to specify the initial hypotheses and to address the question of whether the impact of model-specific success drivers of m-business start-ups outweigh the effects of variables which seem to be of relevance for all types of m-business ventures.

Endnotes
1 In addition to our internet research and to the interviews with venture capital managers, we conducted interviews with the author of an annual report on the German mobile market and with a former board member of an application platform provider start-up.
2 Apart from the insolvencies, further market exit includes for example Condat, smapCo Smart mobile application, iobox and Canbox whose services have been taken over by established companies.

References


