

Good practice in the digital SMEs

Digitální malé a střední podniky: postupy hodné následování

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Abstract: The article summarizes findings drawn from the research carried on within the European project “Best e-European Practices” with a focus on digital SMEs only. Case studies are used to describe good practices. Cases studies are coded structurally using a set of indicators for each success factor and thus provide for learning of the potential users. Synthesis and generalization has been done on factors explaining motivations for introducing e-practices, the results firms seek to achieve and the benefits from the adoption of digital technologies.

Key words: digital small and medium enterprises, critical success factors, case studies

Abstrakt: Příspěvek shrnuje poznatky získané v průběhu výzkumného projektu „Best e-European Practices“. Ze zkoumaných oblastí se zaměřuje pouze na digitální malé a střední podniky, na nich jsou formou případových studií popsány postupy, které jsou hodné následování. Případové studie jsou zpracovány ve strukturované podobě s použitím sad indikátorů pro jednotlivé faktory úspěchu, a tak poskytují uživatelům prostor pro učení. Z poznatků získaných prostřednictvím případových studií byly zobrazeny faktory vysvětlující motivaci pro zavedení digitalizovaných postupů do podnikání, výsledky, kterých se firmy snaží dosáhnout a přínosy, které digitální technologie nabízejí.

Klíčová slova: digitální malé a střední podniky, kritické faktory úspěchu, případové studie

INTRODUCTION

Since the mid-1990s, small and medium-sized businesses have been increasingly adopting digital technologies and applications. While most firms have been using computers for word processing, databases, accounting and presentation purposes over the past two decades, the widespread penetration of the Internet and practically universal uptake of e-mail over the past decade have changed the ways in which small and medium-sized enterprises (SMEs) do business in fundamental ways—in particular in their relationships with customers, other firms and in linking different internal business functions. Recent developments, such as broadband, various wireless applications (wifi, personal digital assistants – PDAs, advanced cell phones – UMTS), XML, IM (instant messaging) and the ability to undertake rapid 3D prototyping have had important impacts on the transaction and communication speed, the level of connectivity and the ability to quickly realise designs and ideas.

Many businesses have also gone beyond the first step of ‘going digital’ (i.e. e-mail and a basic informational website) by incorporating electronic processes linking their firm with other businesses (B2B), with consumers (B2C), within specific value chains and within different structures inside the same company.

While requiring certain investments, digital technologies have helped firms to save money, to improve communications, to speed up and streamline business processes, to increase efficiency, to allow networking, and to provide a powerful marketing tool for accessing wider geographic markets: essentially, information communication technologies (ICTs) help in promoting competitiveness. This reflects the strategic goal of the 2000 European Council in Lisbon, which was to make the EU (and in this case, the enlarged EU, given the extended timeframe) ‘the most competitive and dynamic knowledge-based economy in the world by 2010’.

The article therefore focuses on good practices in the digital SMEs and thus provides for learning for small and medium-sized businesses that are considering adopting or expanding their use of digital practices. The findings are drawn from the research carried on within the European project Best e-European Practices (BEEP) funded within IST scheme.

PROBLEM DEFINITION

Larger and multinational firms have widely adopted electronic business practices, while SMEs as a whole, which represent more than 99% of all businesses in Eu-

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rope, have been slow in moving beyond the basic front-end applications, generally involving Internet webpages and e-mail. In a recent e-Business Watch survey of over 9 200 enterprises in the four largest EU economies, it was found that nearly all of the EU4 firms use computers and are connected to the internet (small firms with 0–49 staff: 84.2%; medium sized firms with 50–249 employees: 96.1%); yet nearly 30% of small firms still used analogue dial-up modems. According to the e-Business Watch statistics, 71.7% of SMEs have a website; 43.5% procure online; 17.6% sell online; 21% of orders are fully automated from the front office to the back office; 15.9% negotiate contracts online; and 5.8% participate in B2B e-marketplaces, while only 10.4% of the surveyed enterprises indicated that e-business constitutes a significant part of their operations. Furthermore, it was found that only a minority of the surveyed SMEs had integrated their on-line orders with their back-end system (8.4% of small firms, 17.9% of medium-sized firms), in contrast with nearly 40% of larger companies with over 250 employees. The survey also noted significant differences between SMEs operating in different branches in the adoption of CRM usage, as well as differences between countries.

Economies of scale require that the smaller enterprises must invest relatively more in human resources in their more limited IT infrastructure compared with larger enterprises. Most of the on-line orders processed by SMEs (73.2% for small firms, 63.7% for medium-sized firms) take place via e-mail, which is then handled by a human operator. Very few SMEs have yet adopted a capacity to engage in sophisticated electronic processing of on-line orders.

In other words, the main message of the survey was that, while SMEs have taken the first step in going digital (Internet, e-mail, websites, selling and procuring on-line – mainly front-end applications) and they seem to be satisfied with these innovations, they are finding it much more difficult to digitally integrate their business processes as most of the larger firms have done. There are technical reasons for this (including lack of interoperability and absence of good applied standards, among others), but also economic reasons (difficult mobility across supply chains and electronic markets; unequal benefits across vertical organisations based on proprietary standards and rigid technological platforms); and high cost of membership and of interaction. Within this context, the Beep digital SMEs cases show examples of how some small and medium-sized businesses have successfully adopted greater integration of business processes.

Attention is devoted to SME evolution and to the ‘external’ factors, related to the digital economy, which directly affect SME success and development. This focus will result in addressing:

- Structural changes in SME organisation and management related to the impact of digital economy
- Changes in the competitive scenario that may affect SME evolution.
- Interventions and policy instruments that have contributed to fostering SME adaptation to the digital economy.

OBJECTIVES AND METHODOLOGY

While it is difficult to define SMEs in a strict sense (especially since the definition according to number of employees and turnover can vary from country to country), we use the definition applied by the European Commission. The definition of a SME adopted by the European Commission addresses two standard criteria: the number of employees and one of two financial criteria, i.e. the turnover threshold or the balance sheet total. The figures of the financial criteria are adjusted regularly, normally every four years, to take account of changing economic circumstances in Europe. In addition, the enterprise must be independent, which means that less than 25% can be owned by another enterprise (or jointly by several enterprises). Within the non-primary private enterprise sector, the following size-classes are identified (Table 1).

Many of the SMEs covered in the Beep analysis are micro-enterprises (10 employees or less) and small firms (less than 50 employees); however, the limited size of staff is not necessarily a problem in doing business, even in global markets. In fact, it is mainly through the adoption of digital technologies that these tiny firms are able to offer their products and services on a regional, national and even international scale. It is particularly in market niches that these enterprises have been able to obtain successful results.

Small size and flat hierarchy favour short decision-making processes and a very quick realisation of new ideas; but small size also limits capacity, and the staff (more often than not they are also the proprietors) frequently work on weekends and evenings to complete projects. Yet also in this latter aspect (i.e. working outside of normal business hours and even from home or another remote location), ICT has shown its value to businesses. In fact, one of the most important results of going digital for small firms is that ICTs have amplified staff capaci-

Table 1. European Commission definition of SMEs currently in force

	Medium-sized	Small	Micro-enterprises
Max. number of employees	< 250	< 50	< 10
Max. turnover (million Euro)	40	7	–
Max. balance-sheet total (million Euro)	27	5	–

Source: EU, OJ L 107 of 30. 4. 1996, p. 4

ties, particularly in a number of administrative, financial and stock management applications.

Definition of issues and key factors

The case study approach has been adopted as the most appropriate one to provide for learning of potential users. Cases have been coded for further use in the knowledge base in accordance with the identified success factors. The SMEs studied are mainly European, though there are some cases from East Asia and the United States. Each case study tells the story of a SME and its motivations and actions in adopting and incorporating digital technologies.

Among the main topics covered in the area of SMEs are the following:

- Motivations: What led the SMEs to adopt digital technologies and applications
- Methodology: How did the firms go about implementing these technologies and applications: which steps did they take to reach their objectives.
- Resources: Which human, financial and other resources did they use?
- Results: What results and outcomes were obtained?
- Lessons: What are the lessons that can be useful for other firms?

In answering the question “What needs are most important to the user?”, the user objectives are defined – a set of relevant objectives for each user type. In this sense, the user objectives are the traditional critical success factors (CSFs) but at a higher level, e.g. resolving human resource problems, cutting costs, learning, etc. Some objectives can be obtained from the eEurope Action Plan since the objectives listed there are relevant user objectives.

Critical success factors (CSFs)

A set of CSFs is determined for each objective. CSFs describe what to benchmark, and it is these that are mapped and measured using indicators, resulting in benchmarking scores. The purpose is to select CSFs, which are the most important in the Beep cases in indicating the achievement of a given objective. CSFs are always measured (using indicators) as changes resulting from case implementation, and which the case presents as being brought about by the case. However, it is important to note that no causal relations can or will be inferred.

Indicators

The achievement or otherwise of each CSF is measured using one or more indicators, which can be either quantitative (i.e. based on real data) or qualitative (based upon subjective but rigorous assessments of the level of achievement).

Best practice descriptions

A best practice description explains how the score(s) of the indicator(s) for a given CSF were achieved, i.e. what assumptions and background conditions were in place, which resource and other inputs were used, which activities were implemented, which results and outputs obtained, and what lessons learned and conclusions drawn. The best practice descriptions prepared for each CSF will normally be collated together within a given case in order to avoid repetition and optimise synergy across the case.

Case characteristics

In addition to domains, objectives, CSFs, indicators and best practice explanations, which are clearly domain-specific, the Beep knowledge base will include generic case characteristics. These describe background but important attributes of a case, which will mainly be used for searching in the Beep databases. Apart from management characteristics (such as name, number and contact details of the case), these include such characteristics as the timing of the case, its geographic setting, the ICT employed, the main actors involved, the number of people directly contributing and benefiting, the EU or other programme or initiative to which the case belongs (if any), and investments in and costs of the case.

RESEARCH FINDINGS

In field analysis, it has been shown that globalisation is a strong driver of the introduction of e-commerce, rather than the reverse. This is why multinational companies are more likely to engage in cross-border e-commerce operations than SMEs, which tend to operate in their domestic markets. As far as SMEs are concerned, the Internet is used as a complementary channel for sales and other transactions (for example within a supply chain) mainly in the local markets that they have traditionally served. Through the Internet, SMEs – mainly operating in mature industry sectors – have an opportunity to get closer to their customers in providing additional services to them. The focus on penetrating global markets is mainly embraced by those small – or even micro – businesses that operate in market niches.

The firms surveyed expressed a number of different motivations for introducing e-practices, among which are the following, though not necessarily listed in order of importance:

- *Increased market access*: the ability to sell to global markets. This has been particularly important for the small niche operators (such as Roundstone, which hand-makes Irish bodhrums; the graphics and illustration microfirm, Artbox Studios, which seeks to serve and expand its transatlantic clientele from a non-metropolitan US location; and Global Recycle, an online trader of waste products to be recycled). Several cases indicate

that the introduction of e-commerce has resulted in export sales accounting for significant shares of turnover, though in some cases (Zooplus, the on-line pet supply retailer; and Wollywood, a wool retailer) the expansion was mainly in the domestic market.

- *Improved relationship with customers*: 24/7 services and an increased ability to provide up-to-date information, catalogues and pricing on-line. Furthermore, firms were able to post related content on their sites that helped to build customer interest and loyalty. Zooplus, the German pet supply e-retailer, created an on-line community focusing on the interests of pet lovers and animal fans in general, while at the same time providing quick and responsive service.
- *Streamlined transactions*: e-commerce can simplify the ordering process and reduce transaction costs, and the time required to process orders and ship out products can be significantly decreased. In cases where the ordering process is integrated with stock holding, control over inventory is much improved, while at the same time customers can only order products that are actually in stock, as seen in the case of Dubarry, the Irish shoe manufacturer, which sells its specialised boating and outdoor footwear on-line. The integration of transactions is also seen in the case of Bennewitz, the East German optical e-retailer and micro-firm, which have internally developed an e-commerce order integration software that has been so successful that it is now being marketed to other small businesses as a sideline.
- *Innovative marketplaces*: several of the cases provide examples of SMEs establishing B2B marketplaces, for instance Pefa, the online fish auction, and Global Recycle, thus employing mechanisms that were previously not cost effective in linking potential suppliers and customers.
- *Clusters*: an extension of the above occurs in a few of the cases where complementary suppliers form consortia to address customers' needs that individually they could not handle, as seen with the group of Finnish auto parts manufacturers involved in Autolinkki and with Koncraft Manufacturen, in which individual microfirms (joineries) work together electronically to better meet the demands of the market;
- *Mass customisation* – this was a feature in the one case (Bivolino, a firm that custom designs men's shirts using digital technologies) in which a mass-produced product can be customised to the needs of individual customers.

Within the digital SME domain, there are four important results that firms seek to achieve through the implementation of digital technologies and applications:

- *Networking*: The objective is to improve networking: ICTs are used to help firms work with each other and with suppliers and distributors to integrate supply chains as well as consumer networks. Intranets and extranets have been particularly useful in achieving this objective. The good practice analysis focuses on how digital

technologies and infrastructures facilitate access to information and knowledge through networks (the key factors are associated with ICT networks, supply chains, customer networks and collaborative networks). The highlighted key factor in the analysis is 'to improve networking'.

- *Innovation*: The objective is to improve innovation within an organisation. ICTs allow firms to innovate their products and services and integrate their business processes to operate more efficiently and be more responsive to customer needs as well as internal demands. The good practice analysis covers innovation of current products and services with the input of digital technologies or by introducing new and/or integrating upgraded business processes. The key factor highlighted in the analysis is 'to improve innovation within an organisation', whereas the analysis also draws on some of the key factors covered within the objective mentioned below: 'to improve the effectiveness of human and knowledge resources'.
- *Resources*: The objective is to improve the effectiveness of human and knowledge resources. ICT can help firms to improve their access to knowledge resources as well as to use these resources effectively to improve the capacities of human resources, for example in undertaking financial transactions, engaging in business management and formulating and implementing business strategies. The analysis will show good practices of innovation of current products and services with the input of digital technologies or by introducing new or improving existing business processes. The key factors covered in the analysis all pertain to the objective 'to improve innovation within an organisation' and also draw upon some of the key factors in the objective 'to improve the effectiveness of human and knowledge resources'. The key factors covered include 'use of knowledge resources', 'matching of human resources to business needs', 'use of financial transaction tools', 'business management' and 'business strategies'.
- *Marketing*: The objective is to improve the effectiveness of B2B and B2C tools in marketing to customers/clients. ICT broadens firms' marketing reach and e-commerce applications allow them to sell their products and services online. The analysis will describe the adoption of e-commerce practices both in B2C and B2B transactions. The key factors all contribute to the objective 'to improve the effectiveness of B2B and B2C tools'. The analysis covers the key factor 'improving marketing', whereas the key factor 'use of e-transaction tools' is also described within the overall discussion.

Many cases reported significant benefits from the adoption of digital technologies: some of these benefits were not initially identified as main motivating factors, but grew increasingly important as the new uses of ICTs became an integral part of business operations. Some of these results are the following:

- *Improved relationships throughout the supply chain* – the use of extranets, for example, gives suppliers and

customers visibility along the supply chain and permits making more informed sourcing decisions. Chasestead, for example, a Prototype Engineering Company which produces low volume sheet metal parts and their assembly, and specialises in subframes and other automotive understructure components, is now using project-based extranets, job bar-coding and database-linked telephone systems to revolutionise the way it works with its suppliers and customers.

- *Employee satisfaction* – many cases show how time is saved on routine administration such as dealing with status queries and following up orders. This time saving allows them to concentrate on more interesting and productive (value-added) activities. In particular the microfirms, such as Bennewitz and Wollywood, surveyed showed this characteristic.
- *Better market understanding* – several cases discovered real value in being able to conduct research on line, including competitor research. This gives astute companies an advance awareness of emerging trends. The Irish shoe manufacturer Dubarry conducted a detailed web-based competitor analysis as well as research on other companies' websites (not only those of competitors) prior to setting up its upgraded website. Also, especially in B2B marketplaces, online research identifies new (and often cheaper) suppliers.
- *Faster product development* – quicker turn-around on specifications and designs; also rapid prototyping using 3D CAD and broadband (as seen in the example of Materialise, which provides rapid prototypes to order).

The critical elements to be considered in making sense of SMEs going digital are:

- knowledge mobility within business networks
- organisational innovation according different integration models.

Among others, the very important lessons we have drawn from the BEEP exercise, as well as from other research and surveys, concern the three following key success factors:

- the intimate knowledge of own business and the ability to translate this knowledge into an effective website and related services that continue to be requested by customers, or partners
- the use of ICT creates a positive loop of increased ICT use, so that the increasing awareness of the benefits of ICT within networks can occur through the joint implementation of key content, the promotion of business growth, and economic regeneration
- the Internet has provided companies with an unlimited number of access channels and communication possibilities with intelligent systems, which in turn has led to the emergence of new forms of intra-company organisation as well as inter-company co-operation and competition. Flexibility in the usage of both traditional and modern practices and communication channels is also needed in many cases, to ensure business inclusion or prevent the exclusion from digital networks.

CONCLUSIONS AND RECOMMENDATIONS

The development of the knowledge economy is driven by factors of production, including innovation, design, branding and know-how, which represent competitive advantages in an increasingly global economy. Increasing the competitiveness of enterprises is crucial in stimulating growth and employment in the European economy. Within the domain covering Digital SMEs, the Beep analysis focused on the change introduced into firms and their business processes through the adoption of digital technologies. Such change may lead to increased competitiveness, but generally it needs to be coupled with innovation in products, services or processes in order to significantly affect the way of doing business. In the digital economy change tends to be linked to the management of knowledge; whereas competitiveness is measured in terms of the control over and exchange of knowledge.

The access to and use of ICT can make a significant difference in the production of knowledge, which is incorporated into goods, services, organisational practices, resources, and capabilities. The most striking feature of digital technologies is their power to translate information into algorithms and to operate on devices operating universal languages, which make possible low cost and high-speed exchanges and trading of codified knowledge all over the globe. The effectiveness and efficiency of ICT applications are therefore closely correlated to a company's objectives, resources and strategy, its business model, and its particular branch or sector: in other words, to the processes of knowledge accumulation in the enterprise.

The Beep knowledge base has contributed significantly to the understanding of how very differently SMEs across Europe have incorporated ICTs in order to make their businesses more effective. The digital SME case studies provide valuable lessons for other firms that are considering the adoption or expansion of their use of digital technologies. The cases covered by the Beep represent a cross-section of examples that were deemed successful by the team members. Some of them were also pre-selected by the relevant organisations in their respective countries – thus providing a filtering effect.

The following good practices were identified. They are common to most of the domain objectives.

- Need for good planning: many cases underestimated the overall costs of implementation. It was not necessarily the visible hardware and software costs, but the costs of consultants and internal costs in implementing and training. Things always take longer than planned. Doing thorough research and developing a detailed implementation plan featured in several 'lessons learned'.
- Outsourcing: many cases benefited from outsourcing the website development and other ICT activities to external specialists (in particular, the SMEs that received support from the Enterprise Ireland, including Roundstone and Dubarry). On the other hand, some of the SMEs had to set up effective websites on their own

simply because outside specialists could not adequately incorporate the specificities of the particular niche (as seen in the Bennewitz, Wollywood and Artbox Studios cases).

- Adding customer interest and interactivity – the most appreciated websites – and those that attracted repeated visits and customers – generated pages directly from databases, and allowed customer interaction. Putting related content on applications, techniques, market developments and not just on products enhanced the customer experience, especially in specialist markets where some customers need basic information to help them. For example, a ski equipment supplier (Barrabes) provided additional free services on weather, ski conditions etc. A couple of cases ran regular ‘webinars’ and several so-called portals added discussion facilities.
- Customer relationship management: a few cases (not many) had more fully exploited CRM and content management software to personalise offers, for example the zooplus case.
- Internet is just one channel for interaction with customers – often the website contributed to an increased number of telephone calls to the firm. Anticipating this and having a good call centre helped the overall success. The Internet is viewed as a complementary sales channel. One case exploited new channels such as SMS on mobile phones.
- Intranet: several cases cited the benefits of bringing into one place all product and customer information and commonly required documents such as sample agreements. This helped to improve internal communications and aid decision making (e.g. through giving better visibility of the customer history). This was particularly useful for Koncraft Manufacturen, the German “virtual joinery.”
- Extranet: giving customers access to their own information and other privileged information enhances their experience (for example, Sailcoach and Materialise). This practice was not widespread.
- Development of partnerships: e-commerce exposes SMEs to new areas in which they do not have the necessary infrastructure or skills. Common partnerships are with e-commerce software suppliers/consultants. Also, with increasing cross-border sales, several SMEs developed partnerships with courier companies like TNT. Another area of partnership is with complementary suppliers so that online customers can have a “seamless experience” or access a ‘one-stop-shop’.

An important conclusion of this study is that ICTs can increase the capacities and turnover of small firms in spite of structural limitations that are linked to small size, location in a small town or rural area, lack of resources or prospects for physical or geographical expansion, etc. As seen in many of the cases, one of the biggest benefits of putting an e-commerce site on the Internet is that it has opened much broader markets to small firms that once only served their limited local market (for example, Bennewitz, Wollywood). For other firms, establishing an

internet-based intranet and extranet has provided a means to increase their capacity within a network as seen with Koncraft, in which five SMEs function as a virtual joinery. Given the nature of Koncraft products, the aim has not particularly been to expand the geographic market, rather to achieve increased efficiencies among the firms.

The analysis showed in particular that successful incorporation of digital technologies and practices is not necessarily dependent on the firm’s size or the amount of money spent. Among the selected cases, some of the micro-enterprises have had tremendous success in penetrating global markets essentially because of the incorporation of digital technologies in their business processes and the establishment of very effective websites from a marketing and e-commerce perspective. The digitisation of business processes has also helped SMEs to save money, to speed up various functions and to improve efficiency and coordination within the firm. Other firms have achieved positive synergies within enterprise networks that have led to improvements in efficiency of supply chains, knowledge exchange and stimulating co-operation between different types of partners.

Probably one of the most important lessons from the Beep cases is that being small does not mean being unable to penetrate national and international markets. In fact, by setting up effective and sector-tailored e-business websites, even micro-enterprises have expanded their business to far-flung markets. Some of them have even become leaders in their particular niches, whether in national or international markets. A number of the micro-enterprises studied have succeeded in ways they had not foreseen.

By virtue of their limited size, SMEs and particularly micro-enterprises have more limited resources that they can spend on setting up ICT solutions. Yet, in a number of the cases, although investments in equipment (PCs, modems, printers, etc.) and software were necessary, large expenses were not necessarily required, especially if the website and some of the relevant applications were developed internally.

Another important finding was that if small enterprises pool their resources, they are able to achieve far greater results than if they had continued to work independently. Collaborative load sharing within a network of enterprises becomes a critical multiplier of capacity and an excellent way to increase sales.

The cases also show how some small firms are beginning to think not only of their national market but also of Europe as their reference market (or at least some segments of Europe, for example Germanophone, Anglophone or Francophone parts of Europe) and some cases have even undergone a complete globalisation of their market reach to include North America, East Asia and Latin America.

Internally, ICTs have integrated front office with back office practices, increasing efficiency and freeing up resources for other tasks. Such developments had already taken place to a large extent in larger firms, but in smaller

firms, they have represented an important multiplier effect.

Another key message that emerges is that the incorporation of ICTs and digital applications to improve integration of business practices does not have to be expensive, but it has to make sense and truly bring about greater effectiveness and efficiency as well as cost savings. The fact that very small businesses have been able to achieve very good results with minimal investment is mainly linked to the fact that these firms had a very good understanding of how to best digitise certain processes and practices and realistic and practical expectations. In this, the smaller firms tend to have an advantage, given that the people involved in different aspects of the business process are often one and the same, and thus have a better idea of the results they want to achieve and how to achieve them by automation.

Promotion of the uptake of e-business practices is among the major objectives of the EU policy programmes, whether based on the efforts of individual Directorates General (DG-Enterprise, DG-INFOS) or spanning their various competence areas, such as eEurope (including the GoDigital Initiative). eEurope 2002 with its SME Go Digital effort strongly pushed SMEs to adopt digital practices; however, simply adopting digital technologies and applications is only one step in realising the vast potential of a more integrated and unified European electronic market. Within the policy approach currently dominant in the EU and in many Member States, the delay of the SMEs in taking up e-commerce is addressed by catching-up measures (awareness campaigns, take-up measures, awards, etc.) and the hurdles to be removed have either to do with psychological immaturity ('the readiness') and technical solutions to legal-security-privacy-taxation-etc. issues.

There are three major limitations to this approach:

- It looks only at a portion of the digital economy landscape, that is, the front-end Internet marketing, neglecting the impact of the lack of interoperability and of integration with the back-end business processes.
- The transaction-cost reduction oriented perspective tends to lead to an underestimation of the really new and additional value that the Internet-based applications may provide (information & knowledge circulation – repackaging – creation).
- It is based on a superficial definition of SMEs, associated with size-linked quantitative parameters that cover a very large interval and do not at all qualify the differentiated profiles of the businesses covered in this macro-container.

Another lesson is that the full implementation of e-business solutions is still in its infancy, in particular for most SMEs. Further efforts have to be undertaken, there-

fore, by both the ICT industry and policy makers, to get SMEs on board in order to improve the overall performance of Europe in arena of global competition. Thus, the policy approach needs to take into consideration the role of SMEs within the economic fabric as a whole, with digital technologies as a valuable tool to improve competitiveness and to increase added value, not as an objective in itself. Simply getting firms to go digital will generally provide some benefits to them, albeit with some investment cost. To have a greater and more positive impact on the European economy as a whole, digitisation should also lead to the creation of added value, new and redefined jobs, greater speed and efficiencies, emergence of new networks and innovation of products and processes, yet in ways that reflect the particular sectors or branches in which the target SMEs are operating. One of the biggest challenges will be to translate the cumulative gains brought on by adoption of ICTs into lasting and wide-reaching positive effects that are not just restricted to technological niches or to firms that have gained advantaged positions in supply chains of large companies. Certainly the Beep cases can provide valuable inputs for policy makers on the potential directions in which policy support could be oriented.

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