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Marko Ovaskainen

Qualification Requirements of SMEs in Internet-based Electronic Commerce

Findings from Finland

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ABSTRACT

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Finnish Summary
Diss.

This study analyses the qualification requirements of small and middle-sized enterprises (SMEs) in Internet-based electronic commerce (e-commerce). The aim is to provide information for SMEs, but also for educational institutions and the public sector to find appropriate practices to respond to the requirements.

The study utilises an applied version of the Delphi technique. The research process consisted of two-phased interviewing of both experts of e-commerce (15) and representatives of SMEs in e-commerce (10). The analyses of qualification requirements are based on a functional classification of qualifications. The study concentrates on a qualitative analysis of qualification areas at the level of enterprises as entities. It also provides quantitative information on the significance of different qualification areas and their subareas. The study also includes analyses of the development trends of e-commerce, position of different kinds of SMEs in electronic markets, as well as a number of strategic considerations from the viewpoints of different SMEs.

According to the results, e-commerce requires a challenging set of both business qualifications and technical qualifications. SMEs should develop their e-commerce activities based on a strategy, which fits their background, resources and business objectives. Limited qualifications and scarcity of resources typically restrict the opportunities of SMEs to develop their e-commerce activities. In turn, potential success factors of SMEs include a clear business focus, specialised knowledge on the chosen markets, flexibility and networking. Also, if SMEs successfully redefine their positions in restructuring value chains and networks, it may open new success potential.

The qualification requirements of an SME in e-commerce are partly related to the size of the enterprise, the role of e-commerce in the overall business concept, the development phase or maturity of e-commerce solutions, as well as the chosen customer groups, markets and products. According to the results, business related qualification requirements are emphasised in e-commerce. Still, different qualification areas are complementary, and a successful enterprise can combine them as an entity that provides added value to customers.

Proactive development actions and flexibility are required both from SMEs and education to meet the changing qualification requirements of e-commerce. Appropriate public sector interventions may also help SMEs to improve their ability to respond to the challenges of e-commerce and develop related qualifications.

Keywords: qualification requirements, electronic commerce, SMEs

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This thesis is the product of a long process, and it has developed into its final form over a number of years. The journey towards the final goal can be described as a long and sometimes also a rocky road. Still, at the same time the experience has been highly fruitful and rewarding, and I am sincerely delighted that I have reached the reward of the journey in the form of this printed thesis.

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I have now reached an important milestone in my research activities. Related to my research objectives, I also hope that this thesis serves both academically and practically the development of electronic commerce, and especially the development of required qualifications in SMEs. In any case, the accomplishment of this study is a remarkable step for me as an individual, and from here it is good to continue towards new opportunities and challenges. I thank you all, and now it is time to move on.

Kokkola, December 2009

Marko Ovaskainen

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1 INTRODUCTION

Electronic commerce (e-commerce) is a significant economic phenomenon that has been developing rapidly over the past years. Electronic commerce can also be seen as a part of a larger phenomenon that can be called dematerialisation of economy and society (c.f. Aaltonen & Wilenius 2002, 63). This phenomenon has been discussed widely in the past few years, and e.g. Rifkin (2000) has even argued that a gradual shift towards a network based economy will be the widest and deepest change in the modern world economy. The development of electronic commerce and electronic business models are important elements of this potentially radical change (Aaltonen & Wilenius 2002, 10; c.f. Kolehmainen 2004).

Both in public discussion and in the research of electronic commerce, interest has often been mainly on large companies and commercial chains with relatively large resources to develop and widen their offerings to electronic markets. Nevertheless, the development of e-commerce opens new opportunities also for small and middle-sized enterprises (SMEs). Simultaneously, it brings a number of new challenges to SMEs, related to the development of their business competitiveness, qualifications, and the overall ability to tackle opening opportunities and to avoid potential threats.

Regardless of the size of a business, qualifications and competencies can be argued to be crucial resources for successful electronic commerce. Typically, these resources are especially scarce in SMEs. Still, it would be necessary for SMEs to find suitable ways to develop their electronic commerce activities based on related competencies and qualifications. This emphasises the need for research information on e-commerce and especially its qualification requirements, especially from the viewpoint of SMEs and their special characteristics.

1.1 Research questions and objectives

In this study, the main research topic is to analyse the chosen research phenomenon, i.e. qualification requirements of SMEs, in the chosen research context of electronic commerce (e-commerce). The two main research questions can be expressed as follows:

- ***MAIN QUESTION 1: What are the qualification requirements of SMEs in Internet-based electronic commerce?***
- ***MAIN QUESTION 2: How could SMEs be supported to acquire the required qualifications?***

This study concentrates on small and middle-sized enterprises (SMEs), which also had an impact on the choice of the analytical framework of qualification requirements. The emphasis of this study is mainly on qualitative aspects of qualification requirements, and deep quantitative analyses have been limited outside this study. This deliberate choice is also based on the suggestions for relevant approaches on electronic commerce research that have been published in a number of researches and policy reports (e.g. European Union 2002, 10).

In addition to the chosen main research questions, there is also a number of subquestions related to both of the two main questions. These subquestions can be listed as follows:

- ***MAIN QUESTION 1: What are the qualification requirements of SMEs in Internet-based electronic commerce?***
    - *What (mega)trends can be found to be related to and influence the development of electronic commerce and its qualification requirements?*
    - *What strategic opportunities and development challenges are there for different kinds of SMEs in electronic commerce? What could be the most important success factors of SMEs in e-commerce?*
    - *To complement the analyses of qualification requirements of e-commerce at the level of enterprises, what can be said about the qualification requirements of an individual working in a SME?*
- ***MAIN QUESTION 2: How could SMEs be supported to acquire the required qualifications?***
    - *How could educational and training institutions and activities support SMEs to meet the qualification requirements of e-commerce?*
    - *How could the public sector and its activities support the development of e-commerce and required qualifications in SMEs?*

First of all, this study thus aims to provide systematic information on the qualification requirements of SMEs in electronic commerce. Still, in order to understand qualification requirements (research phenomenon), information is aimed to provide on the development of e-commerce in SMEs (research context). Further, this study also aims to suggest development activities both in SMEs as well as education and training to respond to the requirements.

The operationalisation of qualification requirements in this study was problematised by the multidimensionalism and the partially abstract nature of the concept. When developing the construct to represent qualification requirements, as a part of the operationalisation process, the validity of the research had to be taken into consideration. In the research of qualifications and qualification requirements, the emphasis has traditionally been on individuals. Nevertheless, *in this study, the main emphasis is at the analyses of qualification requirements at the level of enterprises as entities*, and an analytical framework has been built for both quantitative and qualitative analyses of qualification requirements of SMEs in electronic commerce. *The analyses concentrate on a classification, where qualifications have been divided to four function-based main areas and their subareas*. This kind of concrete and relatively practical approach to qualification requirements was found relevant for the objectives of this research. The chosen interviewees also found the chosen set of qualifications meaningful and able to form a consistent combination of the qualification areas required in successful electronic commerce.

Here, it should also be pointed out that the timeline of preparing this study report has been relatively long, and a great majority of the empirical data was collected already at the turn of the millennium, in the year 2000. Therefore, it could be questioned how accurate the information is at the time of the publishing of this report, especially when the original aim was to provide future-oriented information. Nevertheless, the qualification requirements at such a thematic level that has been used in this study can be argued not to change very rapidly, despite the rapidly changing technological and business environment and the continuously developing nature of e-commerce. Since the collection of the data, e-commerce and its solutions have developed also in SMEs, but it can be argued that SMEs still struggle with similar key questions in terms of their e-commerce and related qualification development. Thus, it can be argued that both technical and business solutions have went forward since the time of data collection, but still the "big picture" of SME qualification requirements has remained relatively unchanged.

It is naturally up to each reader to evaluate, whether this is the case, but from the viewpoint of the researcher it thus seems that the main content of this study is by no means outdated. Therefore, it can be argued that after the prolonged period between the data collection and the publishing of this study, the aim remains relevant. It is still to provide information that helps both SMEs and educational and training institutions to proactively develop electronic commerce related qualifications and activities to the directions that are seen desirable (c.f. Aaltonen & Wilenius 2002; Järvi-Laturi 2000; Mannermaa 1999a; Mannermaa 1999b).

1.2 Research setting, methods and research limitations

The following paragraphs provide information on the construction of the research setting, research approach and methodological choices, as well as research limitations of this study. The aim is to give a reader an understanding of the background logic of the study, and to report information on a number of issues that have had an impact on its structure and content.

1.2.1 Construction of the research setting

The structure of this study is based on a research setting constructed around the main research question or theme, i.e. qualification requirements of SMEs in electronic commerce. Also, in accordance to the earlier listed subquestions, there is a number of other important themes complementing the research setting. The background logic of the chosen research setting is illustrated in Figure 1.

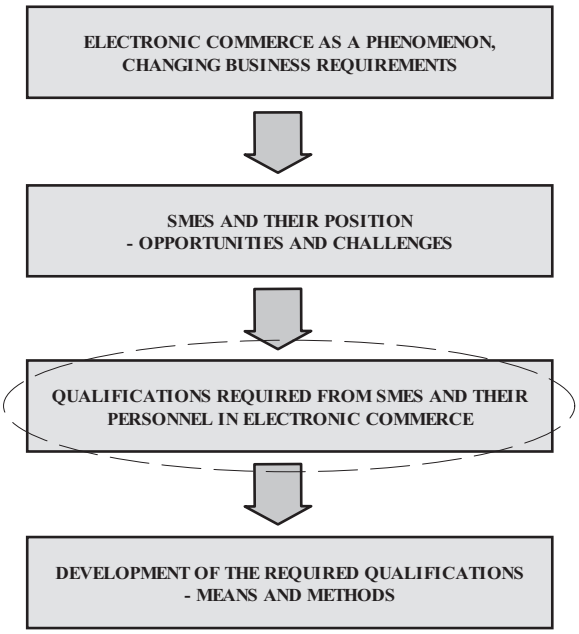

FIGURE 1 Background logic of the chosen research setting

In Figure 1, the circled box indicates the first main research question (or theme), i.e. qualifications required from SMEs and their personnel to succeed in electronic commerce. Additionally, there are two boxes above and one box below this circled box, which can be explained as follows.

First, to understand a highly context specific phenomenon like qualification requirements, it is necessary to understand the development trends of the chosen context. In this case the context is electronic commerce, and the development trends of e-commerce have (both direct and indirect) impacts on the qualification requirements (and their development). Thus, to understand qualification requirements, it is necessary to understand the developments in the context defining the requirements. This explains the content of the highest box in Figure 1.

Second, this study concentrates particularly on SMEs and their qualification requirements. Therefore it is highly important also to understand the special characteristics of SMEs in e-commerce. Consequently, the special questions of SMEs and their position form an important part of the chosen research setting (second box from the top in Figure 1). In general, it has been recognised that SMEs differ from larger companies, and have certain typical characteristics that lead to challenges in competition with larger rivals (e.g. Storey 1999; Littunen 1998). This idea can be also applied to e-commerce and electronic markets. On the other hand, there are also important size and industry differences between SMEs, which makes it inappropriate to adopt only a single approach to solve their challenges (Storey 1999). This is the case also in e-commerce, which makes it impossible to provide any "ready-made success recipes". SMEs have been found to suffer from resource constraints, and often also management weaknesses, and many SME owners and managers also seem to be reluctant to engage in initiatives developing management abilities, skills and professionalism (Storey 1999; Gray & Lawless 2000).

Third, in the lowest box of Figure 1, there is another highly important theme, i.e. the means and methods to develop the qualifications of SMEs. This theme has also been formulated as the second main research question of this study, i.e. how could SMEs be supported to acquire the required qualifications. From the viewpoint of the practical relevance of this study, it was considered necessary to include this topic with a high weight in the research setting. Thus, this study also aims to outline and analyse potential solutions to respond to the found requirements, both by SMEs themselves, but also by educational & training systems, as well as potential public sector actions.

1.2.2 Research approach and methodological choices

In terms of research approach, this study is mainly based on qualitative research tradition. Also, it utilizes the principles of the Delphi research technique, which has been used especially in futures research (Linstone & Turoff (Eds.) 1975; Kuusi 2002; Mannermaa 1999a). The data collection process has been constructed on systematic interviewings in two phases, and also the other parts of the practical implementation of this study, including data collection, sampling etc., are based on a certain applied approach to implement the Delphi technique.

In this study, the emphasis of analyses was deliberately put to the level of enterprises as entities, and a lot of attention was paid to the construction of a suitable analytical framework. The operationalisation and analyses of qualification requirements were based on a chosen categorization of functional work areas in electronic commerce. Four main areas of qualifications, related to *i) Marketing and customer relationship management, ii) Strategic management and business process development, iii) Technical solutions and logistics, and iv) Innovations and product development* were used as the starting point in both quantitative and qualitative analyses, and the chosen approach was found relevant also by the interviewees who found it easily connectable to the meaningful activities of everyday business. For the purposes of the analyses, the qualifications were first classified into four main function-based areas, but to enable also more detailed analyses, these main areas were further divided into relevant subareas.

The analyses concentrated mostly on qualitative analyses of the content of different qualification areas and their subareas, but these qualitative analyses were supported and complemented by a number of descriptive quantitative analyses. These quantitative analyses were mainly used to measure the relative importance of different qualifications and also to provide tentative reference data to back up and to control the relevance of qualitative findings (c.f. Grönfors 1982, 14; Strauss & Corbin 1998). Overall, the data analyses consist of complementary phases that are described in more detail in the empirical part of the research.

It is noteworthy to mention that this study is multidisciplinary by its nature. It aims to combine elements of different research traditions to find relevant answers to the challenging research topics. As an example of multidisciplinary approach, the main research topic combines elements of business economics, entrepreneurship research and educational sciences. Traditionally, the main research phenomenon, qualification requirements, has been discussed mainly in educational science. However, lately the importance of qualifications (and competencies) has been increasingly emphasised in business and entrepreneurship research, since the importance of human capital as a crucial success factor has been widely recognised and understood (c.f. Hamel & Prahalad 1990; Otala 1996; Ruohotie 2002). The multidisciplinary approach has also made the planning and implementation of this study interesting.

Another important dimension in this study is time. A factor that made this study challenging to plan and implement was its future orientation. Especially at the time of information collection (turn of the millennium), the main research questions were new, anticipatory and future-oriented by nature. The study includes analyses of the qualification requirements in electronic commerce, both in short term and longer term. Still, to study and anticipate the future, it was also important necessary to understand the developments of the past and the present (Malaska 1993; Mannermaa 1999a). Hence, it was considered necessary to include analyses of the present as a part of the research setting in this study, and thereby also to map potential developments from the present to the future.

1.2.3 Research limitations

This study has a number of important limitations. First, both the research phenomenon, i.e. qualification requirements, and the chosen research context, i.e. electronic commerce, are topics that could be approached from various aspects. In this study, the approach has strongly concentrated on qualification requirements and the development of e-commerce from the viewpoints of business economics and entrepreneurship. On the other hand, e-commerce is strongly connected to the development of information and network technologies. Still, it must be pointed out that despite the importance of technologies, detailed technological questions or anticipations of technological developments have been intentionally narrowed beyond the scope of this study. It is also noteworthy to mention that in this study, qualification requirements were analysed at the level of enterprises as entities, instead of a more traditional approach in qualification research mainly concentrating on individuals.

This study also has important limitations in scope. Geographically, it is limited to Finland and concentrates especially on Finnish SMEs. Nevertheless, as electronic commerce is a highly international phenomenon, the study may provide interesting information also to readers outside Finland. Also, the conducted analyses of qualification requirements are limited by scope, and they concentrate on a deliberately chosen set of qualification areas and their subareas. Since the conducted empirical analyses concentrate on SMEs the aim was to analyse qualification areas that were considered most important for them in developing e-commerce markets. The chosen qualification areas were then combined into a systematic structure, and operationalised into an analysable and measurable form in a manner, which is described in the empirical part of this study. A number of other qualification areas could have also been analysed, but they were intentionally excluded and left beyond the scope of this study to be covered in potential future research.

1.3 Research motives and relevance

This study can be rationalized both from academic, practical and personal viewpoints. A number of international observations have pointed out a growing need to analyse and understand electronic commerce especially from the viewpoint of SMEs (Chitura, Mupemhi, Dube & Bolongkikit 2008; Daniel 2003; Eriksson, Hultman & Naldi 2008; Jones, Hecker & Holland 2003; Karagozoglu & Lindell 2004; Lawson, Alcock, Cooper & Burgess 2003; Poon & Swatman 1997; Stockdale & Standing 2006; Tse & Soufani 2003; Zhu, Kraemer & Xu 2003). Despite a grown understanding of the importance of the topic, many aspects of electronic commerce development especially in SMEs can be argued to be understudied (e.g. Eriksson, Hultman & Naldi 2008). This has also

motivated the preparation of this study, since electronic commerce certainly seems to be a phenomenon that may have potentially profound impact both at the macro level (competition, market environment, potential shifts in market power, structural changes in business etc.) and at the micro level (change pressures on the strategies and business practices of individual companies and enteprises, new forms of business transactions and communication, changing consumer behaviour and expectations etc.). Overall, the development of electronic commerce can be argued to imply a conceptual change in the commerce and business of many SMEs, and they have to adjust to a new e-business environment, where traditional geographical and time-based boundaries at least partly lose their meaning. Still, electronic commerce is a relatively new phenomenon, and especially in the case of SMEs, there are often remarkable challenges and development needs both at strategic and operational levels.

From the viewpoint of analyses of qualification requirements, electronic commerce can thus be considered as a very interesting, relevant and important context. A lack of qualifications and appropriate skills has been found to remain as one of the barriers of SME e-commerce adoption and implementation, and therefore this study can be argued to have a significant contribution on a current business topic that has spread quickly and can be expected to continue spreading to practically all sectors of commerce. Additionally, since the qualification requirements of e-commerce and responding to them are typically questions that may pose different challenges to different enterprises and individuals, the chosen context of electronic commerce is rich by content and opens room for many-sided and multidimensional discussion, which can be argued to further raise the importance of the topic. On the other hand, it has also been recognised that qualification and skill requirements in e-commerce are difficult to define, which outlines the need for open-minded assessment of them (European Union 2002, 33).

Also, in order to increase the relevance of this study, the discussion is not left to the level of just analysing the qualification requirements, but the aim has also been to find answers on how to respond to the requirements. Since education and training are important systems and tools in providing SMEs with qualified e-commerce personnel, there is also a well-reasoned need to provide information to support their development. Also, in order to promote a proactive development of e-commerce in SMEs, the development of potential (self)anticipation systems and practices has been included as one topic of analysis, as well as potential measures that the public sector could take to support SMEs in their efforts to develop their e-commerce activities and related qualifications.

Below, the motives of this study have been approached by a classification of criteria adapted from Laaksovirta (1988, 33-35), and can be seen as a list of arguments for the choice of a particular research topic or research problem:

1. Theoretical relevance

From the viewpoint of theoretical relevance, motives of this thesis include an aim to increase the theoretical understanding of qualification requirements in a new important context of electronic commerce. Although it is a remarkable challenge, this thesis aims to provide a systematic attempt to approach these complicated questions in a combined form, by the chosen research setting. In addition, this research also aims to encourage further research on these significant topics, and thereby also to support the progress of science.

2. Economic and societal importance

This study aims to provide answers to very important questions of the practical business development of many SMEs. An important objective is to provide SMEs with information, which is relevant for their special needs.

A majority of the early literature on small business e-commerce development has drawn on more general studies of information and communication technologies (ICT) adoption. Later, there has also been an increasing amount of research on the actual e-commerce adoption and development, also with a special geographical or other focus. Still, the aspects of qualification requirements, and human resource development in general, have been under researched, despite the importance of these topics. This research concentrates on these topics, and also aims to map out electronic commerce related qualifications in SMEs. Also, this study attempts to provide information on desirable development measures and educational/training activities to support the positive development of qualifications and to enable the success potential of SMEs in electronic commerce. Thus, an idea in this study has been to help SMEs to make their desired futures happen in terms of the development of their electronic commerce activities (c.f. European Union 2002, 57-58).

Considering the nature of the chosen research topic, and also the research setting that is not equivalent to any earlier research, the author strongly argues that any of the results of this study should not be considered self-clear or obvious. For its part, this can also be argued to increases the value of this study. A part of the research results are in line with earlier research results and can hence be consider quite expected, but also these results are valuable, since they provide information in the context of Finnish SMEs. Also, this study produced a number of results that could be considered at least partly unexpected, which highlights how a research can also question what is in everyday life perhaps considered as self-clear.

3. Personal interest

As a principal lecturer at a university of applied sciences, the author of this study is professionally strongly connected to the development of qualification requirements in business, as well as the development of educational practices to meet these requirements. Thus, the chosen research phenomenon, i.e. qualification requirements, is of high professional relevance to the author.

On the other hand, the research context, i.e. electronic commerce, has been of high interest to the author for a longer period of time. Electronic commerce is a fascinating and complex phenomenon that is likely to have a profound long-term impact on the future of commerce, as well as business in general. During the recent years, e-commerce has been among the top development priorities of many companies and enterprises, and this trend seems to continue.

Professionally, the author of this thesis is also in close cooperation with SMEs, which explains the special interest on their development. Thereby, an opportunity to analyse the chosen research topic in the chosen setting has pushed and pulled the author forward over the relatively long research process. Although the process has been long and has faced some problems, the work on this study has been highly motivating, and the whole process with its different phases has provided a good and fruitful learning experience.

4. Researchability

There is not a clear consensus on the best way to research a phenomenon like qualification requirements, especially in such a new and complicated context like electronic commerce of SMEs. Also in Finland, there is a considerable amount of earlier research and publications on both qualifications and qualification requirements (e.g. Haltia & Lemiläinen 1998; Rauhala 1993; Ruohotie & Honka 2003; Ruohotie 2006; Räisänen 1998; Väärälä 1998), and the development of electronic commerce (e.g. Berg 2004; Brännback & Puhakainen 1998; Heikkilä, Kallio, Saarinen, Salmi & Tuunainen 2000; Hyvönen, Järvelä & Piiroinen 2008; Järvelä & Tinnilä (toim.) 2000; Karttunen, Puhakainen & Rajahonka 2000; Nurmela, Sirkiä & Muttilainen 2007; Statistics Finland 2006, 2008; Tuunainen 1999). They have provided good background information also for this study, but there is not earlier research that would have combined qualification requirements of SMEs and e-commerce in a systematic research setting like in this study. Also, due to the future-oriented and interdisciplinary nature of this study, the development of good approaches to the chosen research topics has been challenging. During the research process, there have been a number of demanding questions to answer, including e.g. the operationalisation of partly abstract and theoretical concepts for the purposes of this study. Still, the process made gradual progress, and answers were found with an attempt to build a reliable and valid research setting to produce results that serve the desired purposes.

5. Explanatory power

From the beginning, the aim has been to construct a research setting that would provide valid and reliable answers to the main research questions. Still, there are important limitations in the conducted study and its methodology, which has to be taken into account when assessing the results. For example, this study is only based on the interviews of a limited number of experts and representatives of SMEs, which problematises the generalization of the results. Here, it must be remembered that this study is mainly based on qualitative

research tradition, where generalization is not an aim in the same sense as in quantitative research (Alasuutari 1999; Eskola & Suoranta 1998; Grönfors 1982; Tuomi & Sarajärvi 2006). Also, it turned out that exact answers to all the research questions were not found by the chosen research setting, which also reminds of the limitations of a single study as an explanator of complex issues. Further, the interpretation of qualitative data is also an area, where potential mistakes can be made and the explanatory power of a research may weaken. Still, the important questions of reliability, validity and relevance have guided the construction and implementation of this study through all the different phases, but it is also up to a reader to judge the successfulness of this.

In conclusion to this paragraph and its discussion on research motives and relevance, it can be argued that there are a large number of important and complementary motives for this study. The study can be justified both by theoretical and practical relevance. The aim has also been to provide reliable and valid research information, remembering the constraints and limitations of the chosen research setting.

1.4 Structure of the thesis

This thesis consists of complementary parts. The structure of it follows a traditional standard structure of a research report, and it consists of an introduction (Chapter 1), a theoretical part (Chapters 2, 3 and 4), an empirical part (Chapters 5, 6, and 7), and a concluding part with recommendations and suggestions (Chapter 8). In Chapter 8, the most important research findings and implications are also critically discussed from the viewpoints of reliability, validity and relevance. The chapter also includes suggestions for potential future research.

The theoretical part of the thesis (Chapters 2, 3 and 4) includes the theoretical framework of the research. Chapter 2 provides an understanding of electronic commerce by illustrating a number of theoretical backgrounds that can be used to approach this multidimensional phenomenon. This chapter on electronic commerce is included as the first part of the theoretical part to help a reader understand the complicated context of this study. Presented viewpoints on electronic commerce also form an important background for the setting and construction of empirical analyses of this thesis, since a research problem like qualification requirements is always strongly connected to the context of analysis. Since this thesis concentrates on electronic commerce especially from the viewpoint of SMEs, Chapter 2 discusses electronic commerce also concentrating on the SME aspect.

Chapter 3 concentrates on the theoretical foundations of the main research phenomenon, and provides information on qualifications and qualification requirements. The chapter also includes discussion on a number of related concepts like competencies, the importance of which have been emphasised in

business development. Chapter 3 is constructed so that it starts from general ideas and definitions of qualifications, and proceeds into a more detailed discussion of qualification requirements. The chapter also aims to clarify that particular approach to qualification requirements, which was used in the empirical part of this study.

In turn, Chapter 4 is more methodologically oriented. This chapter in the theoretical part of this thesis thus concentrates on the theoretical foundations of chosen research approach and methods. The chapter discusses the theoretical background of futures research, and a special attention is paid to the use of the Delphi method, which has been applied in the empirical part of this thesis.

The empirical part of the thesis (Chapters 5, 6, and 7) consists of the description of the practical implementation of the research and research results. Here, chapter 5 starts by the results of an analysis of (mega)trends and potential consequences of these trends from the viewpoint of electronic commerce. Then, the chapter proceeds into an analysis of the position of SMEs in electronic markets. Here, an attempt is to illustrate the special characteristics of SMEs, which also serves as an important background for the determination and analyses of their qualification requirements. Further, the chapter proceeds to map out important strategic questions and critical success factors of SMEs in electronic commerce, and also discusses the specific development challenges of different kinds of SMEs. Overall, the aim of Chapter 5 is to discuss and analyse what kinds of questions and special issues should be taken into account, when aiming to approach the questions of SMEs in electronic commerce and their qualification requirements.

The contents of Chapters 6 and 7 can be considered as the main empirical part of this thesis. Chapter 6 includes the results of analyses that concentrate on the first main research question, i.e. qualification requirements of SMEs in electronic commerce. The chapter starts by a brief analysis of the qualification requirements of individuals, but soon proceeds to the main analyses at the level of SMEs as entities. In the conducted analyses, the qualification requirements of SMEs in electronic commerce are classified under certain themes, and the results are also reported thematically. The analyses include also quantitative parts, but mainly they concentrate on qualitative aspects. After an analysis of chosen main areas of qualifications, the chapter proceeds into a more detailed analysis of different subcategories of qualifications. The chapter ends by a summary of the main results.

In turn, Chapter 7 turns interest on the second main research question, i.e. how SMEs could be supported to respond to the found qualification requirements, and how to acquire and develop qualifications in SMEs. The emphasis is both on the development of qualifications within SMEs and the development of different forms of education & training, as well as relevant public sector support for development activities. Further, this chapter also discusses the needs for and possibilities of SMEs to anticipate qualification requirements and assess the educational and training needs of their personnel in the field of electronic commerce.

Finally, based on the empirical findings, Chapter 8 concludes the thesis, and it includes the discussion of major research implications. The aim of this chapter is also to critically discuss the conducted study and its findings, and to provide concluding ideas for the promotion of a good and balanced development of electronic commerce and related qualifications in Finnish SMEs. The chapter also includes suggestions for future research.

2 ELECTRONIC COMMERCE AND SMES

The aim of this chapter is to provide information on the research context of this thesis, i.e. electronic commerce, and its development. The chapter starts from more general aspects, and then further focuses especially on SME viewpoints, which are of particular interest in this study.

2.1 Electronic commerce as a concept

Electronic commerce (e-commerce) can be defined in a number of ways, and the different definitions vary by scale and content. Narrowly defined, electronic commerce can be seen purely as buying and selling over information networks (c.f. Chaffey 2006). In a wider meaning, in turn, electronic commerce has been defined as a set of activities including information sharing, maintaining of business connections and conducting different kinds of business transactions over information networks (c.f. Adam, Dogramaci, Gangopadhyay & Yeasha 1999; Kalakota & Whinston 1996; Tinnilä, Vihervaara, Klimscheffskij & Laurila 2008; Zwass 1996).

Also, electronic commerce can be approached from the viewpoint of buy-side e-commerce and sell-side e-commerce. Here, buy-side e-commerce refers to electronic transactions to procure different resources needed by an organization from its suppliers. In turn, sell-side e-commerce refers to transactions involved with selling products to an organization's customers. In this study, the focus is on sell-side, i.e. SMEs selling their products and/or services by Internet-based e-commerce. (c.f. Chaffey 2006). Thus, the term electronic commerce in this study has been used in the meaning of sell-side electronic commerce.

Although electronic commerce as a concept is not unambiguous, it can be seen to consist of a set of different activities, including a number of core activities and supportive activities. Electronic commerce can also be illustrated as a combination of business and technology solutions that require qualifications, knowledge and skills in enterprises and companies. Figure 2

represents a systematic, customer-oriented model to illustrate the entity of electronic commerce in an enterprise.

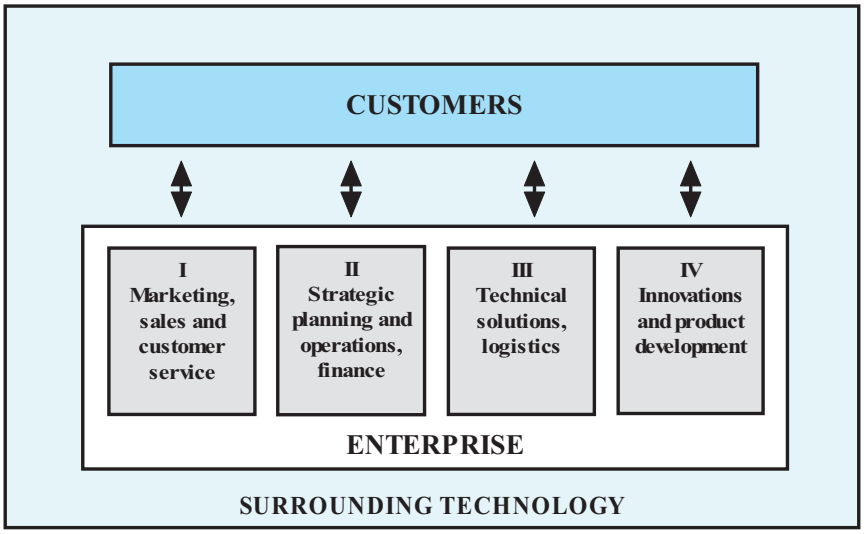

FIGURE 2 An illustration of the entity of electronic commerce (c.f. Kettunen & Filenius 1998, 27)

In Figure 2, electronic commerce is seen as a combination of functional areas (I – IV) that all require relevant solutions and development activities. These areas are related to marketing, sales and customer service, strategic planning and coordination of business operations and finance, technical solutions (also including logistics), and innovations and product development. Further, these areas are also interlinked, and they complement one another. For example, appropriate technical solutions can be a necessary prerequisite for the success in other functional areas, the areas can also be integrated by relevant tools, systems etc.

In addition to the above described functional areas (I-IV), electronic commerce also requires appropriate background technologies and infrastructure (information transfer technologies, network technologies etc.). In Figure 2 this is illustrated in the form of surrounding technology. Technological infrastructure of e-commerce has been, and will be, developing fast, and it also affects the future development potential. Although technologies and technical solutions are largely out of customers' sight in well-functioning and customer-oriented e-commerce, it is significant for enterprises to have an appropriate technological infrastructure to meet changing customer demands and succeed in e-commerce.

Kalakota & Whinston (1996) have represented a well-known framework for electronic commerce (Kalakota & Whinston 1996, 4). In turn, in Finland, Kettunen & Filenius (1998) have also developed a service model framework for electronic commerce. It consists of five different levels: i) infrastructure level, ii)

protocol level, iii) support level, iv) application level, and as an important addition to Kalakota & Whinston (1996) another level called v) customer level (Kettunen & Filenius 1998, 141-142). Here, a key idea is that despite the necessity of well-functioning technological solutions, most important is what is produced by the help of these technologies, and what kinds of services are provided to the customers (Kettunen & Filenius 1998, 26). This framework of electronic commerce is illustrated in Figure 3.

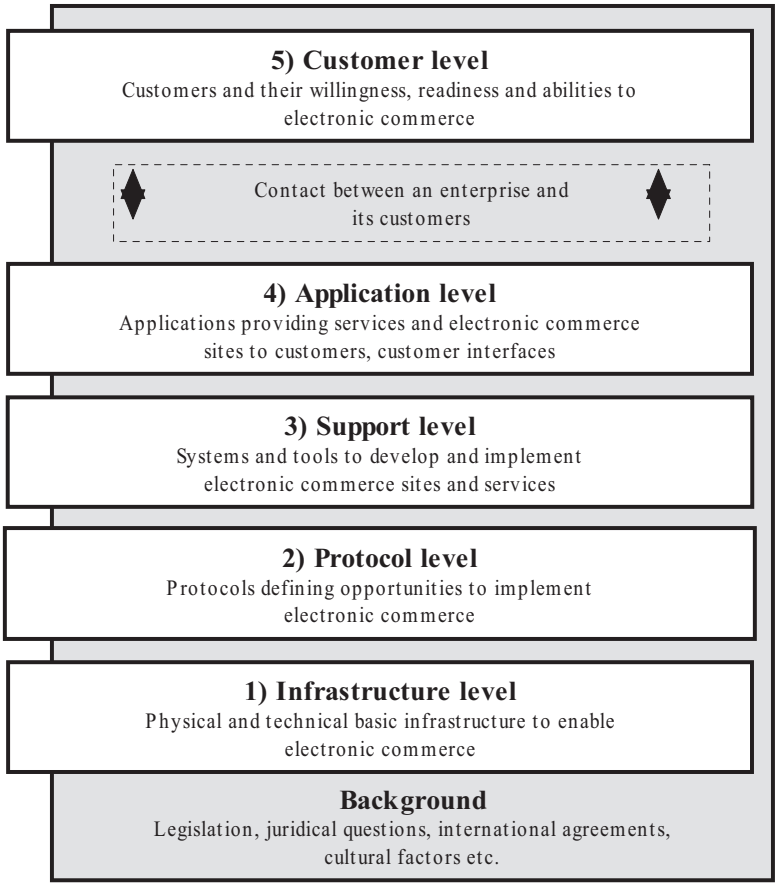

FIGURE 3 A framework of electronic commerce with customer orientation (adapted from Kettunen & Filenius 1998, 142; c.f. Kalakota & Whinston 1996, 4)

In addition to the above models and frameworks, electronic commerce has also been approached from a number of other perspectives. One classification is based on product groups. Here, e-commerce is divided to two main categories according to the delivery channel of products. E-commerce, where products are ordered via electronic networks, but delivered physically by traditional channels, can be called indirect electronic commerce. Accordingly, only the commerce of immaterial products delivered through information networks is called direct electronic commerce in this classification (Järvinen 1998, 10).

Electronic commerce, like other forms of trade, can also be classified based on suppliers and customers (e.g. Doukidis, Poulymenakou, Terpsidis, Themistocleous & Miliotis 1998). From this perspective, the two central forms of e-commerce are business-to-consumer (B-to-C, B2C) commerce, and business-to-business (B-to-B, B2B) commerce. Additionally, there can also be e-commerce between businesses and public administration (business-to-public administration, B-to-P, B2P commerce), and electronic supply of public services to citizens (public administration-to-citizen, P-to-C, P2C) (Doukidis et al. 1998). A further addition to this classification could also be commerce between customers (customer-to-customer, C-to-C, C2C), which has gained increasing popularity, and a number of businesses have been established specialising in these kinds of activities.

In this study, electronic commerce has been defined in accordance with the definition of Electronic Commerce Association of Finland (ECF, http://www.ecf.fi):

> *Electronic commerce is business by the help of the use of information networks. It involves the selling of services, products and information, paying, demonstration, marketing and distribution in their different forms, and also the technologies that enable these activities* (c.f. Kettunen & Filenius 1998, 11*).*

According to the above definition, this study covers both direct and indirect electronic commerce, concentrating on sell-side e-commerce as mentioned earlier. In terms of markets, the emphasis is more on enterprises that are oriented to business-to-consumer (B-to-C) commerce, although business-to-business (B-to-B) commerce has high volumes and forms a majority of all e-commerce transactions (e.g. Nurmela, Sirkiä & Muttilainen 2007, U.S. Census Bureau 2008a). Transactions between public administration and citizens have been narrowed beyond the scope of this study, and customer-to-customer (C-to-C) commerce has not been included in the empirical analyses of this study either. Overall, as a result of these choices, this study thus focuses especially on SMEs operating in B-to-C markets, but partly also in B-to-B markets.

As different definitions illustrate, electronic commerce is not an unambiguous concept, and it has been given a number of different meanings in terms of content, depth and width. Further, both in terms of business and research, there has also been a growing interest in electronic business (e-business) as a wider concept. In fact, e-business can be defined to include all kinds of business using some kind of electronic data transfer (Chaffey 2006), and an increasing number of e-business oriented companies and enterprises, with also new kinds of business models, can be found (c.f. Järvelä & Tinnilä (toim.) 2000; Tinnilä et al. 2008). As a result of the spread of electronic business opportunities there has also been talk about so-called new economy, which refers to a new economic and business environment and culture, which emphasizes dynamic global markets, innovation, cooperation and networking, flexibility etc. (Ali-Yrkkö, Jansson, Karvonen, Mattila, Nurmilaakso, Ollus, Salkari & Ylä-Anttila 2001; Gordon 2000; Kolehmainen 2004; Tse & Soufani

2003). In addition, the term new economy has been used in contexts, where the importance of interactive Internet-based markets has been highlighted, as well as the rising demand for information and knowledge intensive products.

Still, as illustrated earlier, this thesis concentrates on e-commerce, and despite its importance, e-business in wider meanings has been limited beyond the scope of this study. Hereby, the aim has been to focus strictly on the chosen research topics and to have deep insights on them.

2.2 Development trends of electronic commerce

In order to understand the development and the economic impact of electronic commerce, it is good to have a look at the historical development of the phenomenon, as well as to analyse the forecasts that have been made on the development of e-commerce and its volumes.

2.2.1 International aspect

Although electronic commerce is a relatively new phenomenon, in its earliest forms it actually started already in the late 1960's, when the first standards for electronic data interchange (EDI) were taken into use in the United States. Still, only at the late 1990's, the development of the Internet and especially the Worldwide Web (www) enabled a growing part of business transactions to become electronic. The Internet was a unique, low-cost and easily achievable tool enabling new kinds of information exchange and business transactions. (e.g. Haynes, Becherer & Helms 1998). The spread of the use of the Internet and lower connection fees have enabled both businesses and customers to access even globally reachable electronic markets and has created e-commerce in its present form (e.g. Doukidis et al. 1998).

At the end of the first decade of the new millennium, electronic commerce is at an interesting development phase. After a wide-spread e-commerce hype with partly unrealistic expectations that took place in the late 1990s and early 2000s, the public sentiment turned more realistic or even pessimistic, and uncertainty around the development of e-commerce increased considerably. This had negative reflections also on the e-commerce development activities of enterprises, and also financial opportunities for new e-commerce activities were substantially detoriated. During the greatest e-commerce hype, many companies and enterprises seemed to follow a strategy aiming to quickly build a strong Internet brand, to grow fast and to increase market share almost at any cost. Unfortunately, many of this kind of businesses painfully had to realize that the basic economic rules of cost and income also hold in electronic environment, and many e-commerce start-ups were not able to turn their activities profitable. Thereby, through trial-and-error, profitability and other basic rules of business gained back their value and respect also in e-commerce

(Shapiro & Varian 1999; Varian 2000; c.f. Economist 2000). Consequently, it can be argued that while many early e-commerce trials (especially by so-called "dotcom" companies) sought growth as a primary goal, emphasis has later shifted more on developing e-commerce applications to support strategies for long term competitive advantages and profit (c.f. Evans & Wurster 1999; Karagozoglu & Lindell 2004).

After the difficult times in the early 2000's, the e-commerce atmosphere has gradually improved again. The value and volume of e-commerce transactions has been growing constantly, and it has been anticipated to grow also in the future. For example, according to the estimations of a well-known research institute, Forrester Research (www.forrester.com), e-commerce accounted for 7% of total retail sales in the U.S.A. in 2004, but the growing number of online shopping households combined with retailer innovations and site improvements would drive the figure to 13% by 2010. Between 2004 and 2010, online sales would thus grow at a 15% compound annual rate. (Johnson, Leaver & Yuen 2004.) Also in Europe, e-commerce has been anticipated to grow by all accounts, and Forrester Research has estimated that 74 percent of Europeans will be online by 2011, and 54 percent of this group will be shopping on the Internet. This would constitute a group of more than 176 million European online shoppers. (Dellner 2007.)

The Census Bureau of the Department of Commerce in the U.S.A. regularly announces sectoral estimates of U.S. e-commerce sales, and also these estimates have indicated continuous gradual growth. For example, in retail sector, on a not adjusted basis, the estimate of U.S. retail e-commerce sales for the second quarter of 2008 totalled $32.5 billion, with an increase of 8.9 percent (±1.2%) from the second quarter of 2007, while total retail sales increased 2.3 (±0.5%) in the same period. This means that the growth rate of e-commerce would have far exceeded the growth rate of total retail sales. Still, according to the Census Bureau, electronic commerce sales in the second quarter of 2008 accounted only for 3.1 percent of total sales. It is also interesting and noteworthy that this figure is substantially lower compared to the estimates of Forrester Research. One explanation is that the estimates of the Census Bureau do not include travel services, ticket sales, betting, financial services, or the sales of groceries, which all have a remarkable role in consumer-oriented Internet retail. (U.S. Census Bureau 2008b.)

The estimates above concentrated on business-to-consumer (B-to-C) markets, but it should be remembered that according to statistics, a great majority of electronic commerce (over 90%) actually takes place in business-to-business (B-to-B) markets (U.S. Census Bureau 2008a). Still, the volumes of business-to-consumer e-commerce have also been growing steadily and in spite of economic fluctuations and the uncertainty of the future, the same long-term trend can be expected to continue also in the future.

2.2.2 Finnish aspect

The development trends of electronic commerce in Finland have largely followed the international main trends. Also in Finland, a large majority (80-90%) of e-commerce is B-to-B commerce (Statistics Finland 2006, 44, 46), and after the e-commerce hype of the late 1990s and early 2000s, the growth of B-to-C commerce has been slower than then expected (c.f. Tinnilä et al. 2008, 13). At the beginning of the new millennium, in 2001, Suomen Gallup Web Oy estimated that by the end of the year 2000, already 661 000 Finns of 15-79 years had bought products or services through www-pages, and the annual growth rate was estimated considerable, 38 per cent. The share of web buyers among the studied age category was 16.5 per cent, i.e. every sixth person would have been web shopping (Suomen Gallup Web Oy 2001). In turn, according to Statistics Finland, 10% of the 15-74 year old population had ordered something from the Internet during the past three months in spring 2001 (Statistics Finland 2002). Although there is a remarkable difference between the figures of Suomen Gallup Web Oy (2001) and Statistics Finland (2002) for the beginning of this decade, the growth rate of e-commerce has since then been quite considerable. Especially after 2003, the growth has been significant, and the number of electronic retail commerce buyers (persons that have been web shopping) was three times higher in 2006 than in 2001 (Nurmela, Sirkiä & Muttilainen 2007, 24). Figure 4 illustrates this development trend in a time series for the years 2001-2006.

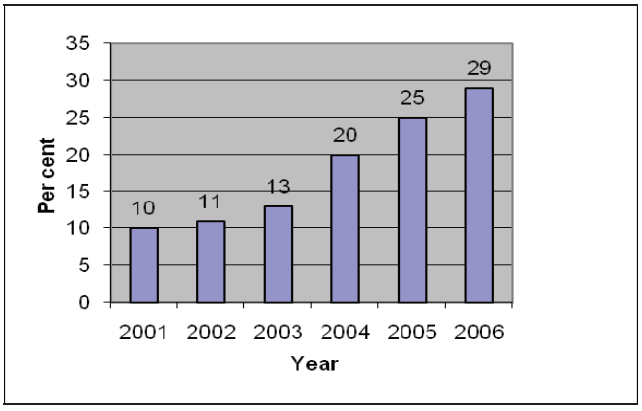

FIGURE 4 Growth of electronic retail commerce buyers in Finland (per cent of 15-74 year old population) (Nurmela, Sirkiä & Muttilainen 2007, 24)

It is an international phenomenon that the Internet use has increased much faster than ordering of commercial products through the Internet. In Finland, already 73% of over 10 year old population reported that they use the Internet, and almost 60% of households had a broadband Internet connection in 2006 (Nurmela, Sirkiä & Muttilainen 2007, 9, 7). Also, both in Finland and elsewhere, the Internet has been found to a stronger role as a medium for product

information than a medium for ordering products. According to Statistics Finland, in 2001, about 39 per cent of the studied population had been seeking for product or service information on the Internet (Statistics Finland 2002). In 2006, the figure was already 87% of the Finnish Internet users, and the corresponding figures for the years 2004 and 2005 were 84% and 85% (Nurmela, Sirkiä & Muttilainen 2007, 11). In a survey that was conducted in spring 2009, the corresponding number was found to be 86%, which is approximately at the same level as in the year 2006 (Statistics Finland 2009). These figures, for their part, indicate that over the years the Internet has gained a very significant importance as a source of commercial information. It has been found that Finns are used to seeking for product and other information in the Internet, and many of them consider the information interesting and beneficial (e.g. Hyvönen, Järvelä & Piiroinen 2008). Also from the viewpoint of SMEs, this is noteworthy, and demonstrates that the overall significance of electronic media in B-to-C commerce is higher than would seem only by the actual online retail figures.

Traditionally, the majority of Internet-users -and potential e-commerce customers- have been seen mostly as young, highly educated individuals, typically also with a high propensity to consume. Nevertheless, this picture is not necessarily true according to statistics. In Finland, there has been a rapid growth taking place also in the Internet use of older population, and e.g. in the age group of 50-59 years, only 22% of population had never used the Internet in 2006, when the same figure was 34% in 2004. In the age group of 60-74 years, the corresponding figures were 56% (2006) and 72% (2004), which illustrates that the share of Internet users has been constantly growing also in older age groups (Nurmela, Sirkiä & Muttilainen 2007, 16).

In terms of education, there is also not anymore a clear correlation between the level of education and the Internet use, especially if the oldest age groups are excluded from the analysis (Nurmela, Sirkiä & Muttilainen 2007, 17). Also, it is noteworthy that in contrast to quite a common belief of male domination, the use of the Internet seems to be quite evenly distributed between genders. In 2001, a half of the Internet users were female, and in 2006 female persons actually constituted already a majority of Internet users in all age groups, excluding over 60 year old persons (Statistics Finland 2002; Nurmela, Sirkiä & Muttilainen 2007, 9).

According to statistics and a number of different surveys, the most popular product groups in retail e-commerce both in Finland and other countries have typically been music, books and magazines, computer hardware, software and games. These were also among the most popular products of consumer-oriented electronic commerce in Finland already according to a survey by Suomen Gallup Web Oy (2001). Still, already at the beginning of the 2000's, the sales of electronic services, including lotteries and betting, financial services and hotel & ticket reservations, were also growing rapidly. Quite similar results were also reported by Statistics Finland, with the sales of leisure-time products and clothes & shoes also showing growth (Statistics Finland 2002). Since then, the sales of travel tickets, hotel reservations etc. have been

growing fast in the Internet. In fact, travel-related tickets and reservations were the most popular products in retail e-commerce in Finland already in spring 2006, and 42% of all Internet buyers had bought these products (Nurmela, Sirkiä & Muttilainen 2007, 25). In terms of supply between different product groups, in the year 2008, of the enterprises that had Internet sales, a large majority (72%) was selling traditional physical goods that were ordered by the Internet but distributed later by more tradinional channels. Correspondingly, 29% of the enterprises with Internet sales were selling services that could be ordered by the Internet but used later (travel tickets, event tickets etc.), and 13% electronic products or services that could be downloaded from or used in the Internet. (Statistics Finland 2008.)

Those products that can be digitalized and distributed via the Internet have been often considered as especially well-suited for electronic commerce (c.f. Aalto, Halonen, Juote, Järvinen & Wihuri 2000; Järvinen 1998; Nurmela, Sirkiä & Muttilainen 2007; Poon & Joseph 2000). Tickets and reservations are good examples of this, since the distributable content of these service products is relatively easy to distribute electronically. Other examples of popular electronic service products are financial services, including e-banking (e.g. Bhatti 2007; Suoranta & Mattila 2004). These are also examples of business sectors, where business models have already experienced radical changes as a result of electronic business opportunities (e.g. Lucas 2002; Ramsey, Ibbotson, Bell & Gray 2003, 251). Continuous increase has also been observed in the Internet sales of such product groups like music, videos etc., resulting from their easily downloadable form and quick broadband Internet connections. Audio and video recordings, games and software are also examples of easily digitalisable products that may have a long product development process, but electronic duplication of which is relatively cheap, which reduces the marginal costs, brings scale benefits and can increase profits when the sold volumes grow (e.g. Tinnilä et al. 2008, 17-18). On the other hand, however, these product groups have also suffered from copyright violations, and illegal copying and distribution over the Internet, which has been estimated to cause losses to the property right owners and has also put traditional business models under increasing pressure (e.g. Meisel & Sullivan 2002).

A potentially surprising fact is that clothes and footwear are actually the second most popular product group in retail e-commerce, right after travel-related services (Nurmela, Sirkiä & Muttilainen 2007, 25). This may be partly explained by the fact that these products have also traditionally been ordered through postal catalogues. Still, there are a number of characteristics that would not suggest that these products were big hits in e-commerce. These products are relatively difficult and expensive to ship or distribute, customers typically also like to try them on, touch and feel them before buying etc. Consequently, especially in the early 2000's, many customers were not eager to buy clothes online due to privacy concerns, inability to touch and feel the clothes, difficulties in getting real customer service, and most importantly fears that returning improperly fitting clothes would be problematic (Regan 2001). Similar

problems have hindered the development of B-to-C electronic commerce also in other product groups, but new and better solutions, like 3-D virtual dressing rooms, have been developed, which may partly explain the observed growth (c.f. Regan 2001). In Finland, the legislation also guarantees customers the right to cancel the deal within 14 days and return the products (Kuluttajansuojalaki 20.1.1978/38), and this kind of returns policy can also be assumed to be a factor explaining the success.

Despite the growth in many products, there are also certain product groups, where electronic commerce has not been able to make great breakthroughs. An example is electronic grocery shopping, which only 1 per cent of e-commerce customers had done by spring 2006 (Nurmela, Sirkiä & Muttilainen 2007, 25). Hence, the volumes of e-commerce in the sales of groceries are still marginal, and dramatic changes cannot be expected, at least in the short run (c.f. Heikkilä, Kallio, Saarinen & Tuunainen 1998; Heikkilä et al. 2000). A problematic factor in electronic grocery shopping has been cost-effective logistics, partly also caused by the special nature of food products. To win the confidence of customers and get them committed, especially good service and high-quality products would be needed from electronic grocery sellers (c.f. Nyström 1999). Still, the attitudes of customers seem to be difficult to turn in favour of e-commerce in this product group. In their study, Hyvönen, Järvelä & Piiroinen (2008) found that many Finns do not have experience in electronic grocery shopping, and the study did not find a lot of observed need for it. Consumers seemed to prefer traditional grocery shops, and expensive prices, as well as inadequate product information and the problems caused by it, together with payment and delivery systems were considered as barriers to online grocery shopping.

Nevertheless, it should be remembered that the whole lifestyle of the future seems to be turning increasingly towards the direction of "Internet life". As an example from Finland, Melkas (2004) reports as a result of her survey that different kinds of ICT-related activities, including different activities in the Internet, are a part of "normal life" both in work, studies and leisure time for young persons between 15-34 years. Thus, it can be also expected that for the new "Internet generations" e-commerce will be a normal part of commercial activities right from their childhood. This could be anticipated to further increase both the overall volumes of e-commerce and the e-sales potential in a continuously increasing number and diversity of product groups.

A small survey to 19-24 year old students

As an interesting empirical survey, in spring 2004, a group of 29 business students at the Central Ostrobothnia University of Applied Sciences (then Central Ostrobothnia Polytechnic) in Kokkola, Finland, was asked by the author of this study to fill in a questionnaire with a number of questions on their thoughts and experiences of electronic commerce. The answering students were 19-24 years old, and 20 (69%) of them were female persons.

An interesting finding was that 100% of the students had been looking for product information in the Internet, which illustrates the power of the Internet in this respect. Approximately 86% of the students had also bought something from the Internet. This is high above the percentages from the whole Finnish population as reported e.g. by Nurmia, Sirkiä & Muttilainen (2007, 24), which illustrates that the Internet really seems to be a natural commercial market for younger generations.

As a slightly surprising finding, the most popular of the bought products were clothes, which 69% of the answering students had bought from the Internet sellers. This may be partly explained by the fact that many of the students were originally from small communities or rural areas, where the number of local clothes shops is limited. The other popular product groups were computing, electronics, books, music, travel tickets, films and games, which was an expected result and in line with the findings of other studies (e.g. Nurmela, Sirkiä & Muttilainen 2007, 25).

Overall, although they cannot be statistically tested or generalised, the results of this small survey for their part indicate that young persons in Finland seem to be more eager Internet shoppers than earlier generations, In addition, the results show that they consider the Internet as a natural source of product (and other) information. In the long run, these kinds of gradual changes may result in more profound changes in consumer behaviour, and lead to a continuous increase in e-commerce sales. At the same time, there may be a growing pressure on enterprises and companies that only concentrate on more traditional forms of commerce. This, in turn, only emphasises the need for anticipatory action also in SMEs to be able to develop their competitiveness, to respond to changes, and to safeguard their long-term commercial success potential.

2.3 Electronic commerce development in SMEs

SMEs have been defined as businesses that employ fewer than 250 people, are independent from other organisations, and are not a part of a larger grouping (European Commission 2008; European Union 2002). Table 1 represents a new recommendation by the European Commission regarding the SME definition (Recommendation 2003/361/EC).

TABLE 1 SME criteria by enterprise category (European Commission 2008)

Enterprise category	Headcount	Turnover	Or	Balance sheet total
Medium-sized	< 250	≤ € 50 million		≤ € 43 million
Small	< 50	≤ € 10 million		≤ € 10 million
Micro	< 10	≤ € 2 million		≤ € 2 million

SMEs, including micro, small and medium-sized enterprises, represent 99% of all enterprises in the EU, and they are seen as very important sources of wealth, new ideas and new jobs (Eriksson, Hultman & Naldi 2008; European Commission 2008). The role of SMEs as active developers of economic life and as employers is very significant. In 2007, 99,7 per cent of Finnish enterprises could be categorised as SMEs, and 93,0% of Finnish enterprises were micro enterprises employing 1-9 persons (Suomen Yrittäjät 2009). SMEs also make a crucial contribution to private sector employment in Finland, and in 2207 they employed 62% of the Finnish labour force employed in the private sector (Suomen Yrittäjät 2009). As pointed out, like elsewhere in Europe, a majority of small firms in Finland falls under the category of micro enterprises, which are operated by a single owner/manager or a very small (under 10) amount of persons (European Union 2002; Suomen Yrittäjät 2009; Storey 1999). The high number and employer status of SMEs also increases the importance of research to develop their success potential in the future markets.

In Finnish and international economy and society, there are a number of important trends that significantly affect the operational environment of SMEs (e.g. Mannermaa (toim.) 2000). These include changes in production processes, increasing business networking, internationalization and rapid technological development. Strongly related to the topics of this study, significant change factors also include the development of IT technologies, increasing use of information networks and e-commerce, as well as e-business in a wider meaning (see e.g. Tinnilä et al 2008). Abilities to systematically analyse the environment, to react quickly to changes, and to anticipate and continuously develop know-how are increasingly required from enterprises regardless of their size (e.g. Hamel 2002; Mannermaa (toim.) 2000).

Traditionally, the SME sector has been characterized by considerably higher failure rates than large businesses (Littunen 1998; Storey 1999). It has been speculated that these failure rates might further increase if SMEs do not adjust to changes in the environment, and for example do not understand the potential significance of e-business on their industries (Daniel 2003, 234). It has been observed that flexible SMEs typically have the best long-term success potential, and by anticipating and systematically developing know-how, the failure rate of enterprises could be potentially decreased and their ability to survive through critical periods could be improved (c.f. Chapman, James-Moore, Szczygiel & Thompson 2000; Littunen 1998).

In the future, small businesses are expected to become in relative terms even more important contributors to economic growth and employment (Eriksson, Hultman & Naldi 2008). In research and literature, there has been a growing interest in SMEs and their particular needs in electronic commerce (c.f. Fillis, Johansson & Wagner 2003, 336). Still, this area can be argued to be under researched, and despite a growing number of international studies, especially Finnish SMEs have not been sufficiently covered in research. This study attempts for its part to improve this situation.

In general, it has been acknowledged that it would be crucial for the SME sector to be sufficiently involved in electronic commerce and the development of the digital economy (e.g. Berg, Karttunen & Rajahonka 1999; Shakeshaft 2001). Still, the size of an enterprise and the exploitation of information technology seem to correlate also in Finland (Statistics Finland 2006, 16; Statistics Finland 2008). Nevertheless, e-commerce (and e-business) has been illustrated to provide also SMEs with new opportunities to develop their businesses and competitiveness. On the other hand, e.g. as a result of increasingly international markets, electronic commerce may also pose threats to traditional SMEs, unless they take necessary development actions.

Traditionally, Finnish enterprises with domestic market orientation have often felt that they are relatively safe from heavy international competition, since the Finnish markets are relatively small and Finnish as a language is not that commonly spoken (e.g. Itkonen 1996). However, this situation has been changing also in traditional commerce, as an increasing number of international companies have entered the Finnish markets, also leading to increased competition. Especially, if the volumes of electronic commerce in Finland keep growing, the interest of international competitors to provide services even in Finnish language can be expected to further grow. On the other hand, it is also often easy for language-skilled customers to order products from abroad through the Internet, which diminishes the meaning of traditional boundaries, and further challenges the Finnish SMEs.

2.3.1 Statistics on Internet use and e-commerce in SMEs

In SMEs, the first step "on the road to the e-world and potential e-commerce" is typically to acquire the Internet access and start to use the Internet, the next step is the construction of some kind of own www-pages, and only after that a part of SMEs take the third step and proceed to actual electronic commerce transactions. Also statistical information on SMEs can be found on all these three steps.

Related to the steps described above, it should be emphasised that the acquisition of the Internet access does not equate with electronic commerce practices. Although the Internet access can be seen as the first step to being involved, it does not guarantee further interest in the development of any e-commerce activities. (Lawson et al. 2003, 265.) It has been internationally noticed that despite the relatively high Internet implementation rates also by SMEs, a significantly smaller portion of them has started e-commerce related activities, like advertising, taking online orders, and offering online payment services for customers (c.f. Jones, Hecker & Holland 2003, 287).

To understand the development trends of e-commerce in SMEs, it is useful to have a look at the historical developments. Especially Statistics Finland has produced good time series information on the Internet use and electronic commerce of Finnish SMEs. In the following, major findings from statistical

information are reported together with related commenting. The information has been classified according to the three steps mentioned above.

Internet access and the use of the Internet

In 1999, the Internet was used by 84 per cent of Finnish enterprises/companies employing more than ten persons, but in spring 2003 the same figure was already 97 per cent. In the case of enterprises employing five or more persons, the time series data only starts from year 2000. Then, 84 per cent of these enterprises were using the Internet, and in spring 2003 the same figure was 94 per cent (Nurmela & Ylitalo 2003, 171). In spring 2006, large Finnish companies (with 50 or more employees) all reported to be using the Internet, whereas among the smallest of the researched enterprises (5–9 employees) the corresponding number was 91 per cent. In spring 2008, also among the smallest enterprises the number was already 94 per cent, which indicates continuous gradual growth also among them (Statistics Finland 2008).

The above figures indicate that the use of the Internet has been growing in enterprises and companies of all sizes, but it is still slightly more common in larger than in smaller enterprises. Thus, there still seems to be a small positive correlation between the company size and the use of the Internet, although the use of the Internet has become common also in smaller Finnish enterprises. Overall, in European comparison, Finland has been number one in the Internet use of enterprises, followed by Iceland, Denmark and Austria (Statistics Finland 2006, 28). Still, also at the European level, it has been estimated that a clear majority, more than two thirds, of SMEs has Internet access and uses the Internet. Additionally, surveys also show that mid-sized enterprises have closed the gap with large enterprises, and small-and micro-enterprises have also started to catch up (e.g. Kula & Tatoglu 2003).

Although the user rate of the Internet is already high in Finnish enterprises, there is still some variation between business sectors. The highest user rate (99%) can be found in the sectors of wholesale and retail as well as business services, whereas at the same time in accommodation and catering services only 87 per cent of enterprises and companies reported to be using the Internet (Statistics Finland 2008). This finding shows that the Internet use is already common in all major business sectors, but also the results of international surveys of small enterprises have shown diversity according to business sector. (e.g. Daniel, Wilson & Myers 2002; Kula & Tatoglu 2003; Matlay & Addis 2003; Lawson et al. 2003; Poon & Swatman 1997). Here, it should also be pointed out that a part of businesses may feel the Internet, and also information and communication technologies (ICT) in general, to be at least partly irrelevant from the viewpoint business and its operations.

It is also noteworthy that enterprises and companies in Finland mostly already have broadband Internet connections. For example, 83% of small enterprises with 5-9 employees already had a broadband connection in spring 2008 (Statistics Finland 2008). This indicates that the availability of technical

infrastructure and Internet access are not any longer significant barriers to e-commerce uptake of enterprises.

Internet home pages

In addition to the Internet use, the number of Internet home pages has been continuously increasing in Finnish enterprises. In 1999, a half of the enterprises employing more than ten persons had Internet home pages, and in spring 2003 the figure was already more than two thirds. In the case of enterprises employing five or more persons, the corresponding figures were less than 50% in the year 2000 and 62 per cent in spring 2004. (Statistics Finland 2004, 17.) The same figure in spring 2008 was 73 per cent, which shows that Internet home pages have continued to become increasingly common in enterprises (Statistics Finland 2008).

A positive correlation can also be found between the size of a business and the possession of Internet home pages. In 2003, 90 per cent of the largest businesses (a hundred or more employees) had them, whilst in the case of the small enterprises with 5–9 employees, the figure was only 46 per cent. In 2006, 67% of Finnish enterprises had Internet home pages. However, the possession of home pages and the size of an enterprise still correlated strongly, and whilst over 90% of the largest companies/enterprises had them, the figure was still only 54% in the small enterprises with 5–9 employees. (Statistics Finland 2006, 34.) In spring 2008, the situation was such that already 94 of large companies had home pages, whilst only 65 per cent of small enterprises with 5-9 employees had them (Statistics Finland 2008). A descriptive time series is that from the year 2000 till the year 2008 the number of Internet home pages has increased by 25 percentage points from 48% to 73% in all Finnish enterprises with at least five employees (Statistics Finland 2008). In European comparison, Finland has traditionally been among the leading countries in terms of home pages of enterprises (Statistics Finland 2006, 34, 36).

Among different business sectors, Internet home pages have been most common in the enterprises of wholesale trade (84%), manufacturing (79%), business services (78%), and post and telecommunications sector (78%). In turn, construction (48%) and transport (50%) were industries or business fields with the lowest percentage of enterprises with own Internet home pages. Interestingly, also no more than 56% of retail trade enterprises reported to have them. (Statistics Finland 2006, 34-35; c.f. Statistics Finland 2008.)

In enterprises, the clearly most common use of Internet home pages is related to the marketing of products, and 88% of enterprises with five or more employees that had homepages used them for this purpose in spring 2008 (Statistics Finland 2008). Also earlier surveys and statistics have shown that a large proportion of SMEs use the Internet as a medium and mechanism for marketing activities, though they would not provide online purchasing opportunities. According to Statistics Finland (2008), in spring 2008 product catalogues or price lists were provided in the Internet by 37% of the researched enterprises, and 13% were selling their products over the Internet, while 22%

were offering after-sales services over the net. A remarkable finding is also that payment opportunities directly from the home pages while ordering were still quite rarely offered (3%).

The other common uses of the Internet have been reported to be the use of banking and financial services, which are used by more than 90% of enterprises, obtaining of information from public authorities, as well as obtaining and returning forms. Important areas of use also included monitoring of the markets and receival of digital products and services, as well as training and education in approximately a third of enterprises. (Statistics Finland 2006, 33; Statistics Finland 2008). The use, and especially receiving, of electronic invoices has also become increasingly common in Finnish enterprises. Some forms of electronic invoices (including EDI-invoices) were received by 37% and sent by 21% of enterprises in the year 2005, and the corresponding figures in the year 2007 were 49% and 32%, and these figures indicate continuous growth in both receiving and sending side (Statistics Finland 2006, 51-54; Statistics Finland 2008).

Internet-based e-commerce and Internet sales

In Finnish statistics, Internet-based e-commerce refers to the filling of an electronic order form online and sending it via the Internet, and to purchases made in actual online stores. Thus, for example orders placed with ordinary e-mail messages are here not regarded as e-commerce. On the other hand, the orders via the Internet are counted here as e-commerce, regardless of the payment or delivery method (c.f. Statistics Finland 2006, 42-43).[1]

In 2005, of Finnish businesses employing more than five persons, 11 per cent reported to have Internet sales (Statistics Finland 2006, 43-44). Interestingly, in 2007, the same figure was 10 per cent (Statistics Finland 2008). The figure of the year 2007 is thus lower than earlier, but it has been explained by a change in the questionnaire, which has since the year 2006 emphasised that orders and sales by e-mail should not be calculated here as e-commerce. Therefore, it can be argued that the lower figure of the year 2007 should not be interpreted as a sign of a decline in the interest in e-commerce. (Statistics Finland 2008.) Anyway, the number of enterprises that have Internet sales is relatively small compared to the finding that 67% of these enterprises had Internet homepages in spring 2006 (Statistics Finland 2006, 34-35) and 73% in spring 2008 (Statistics Finland 2008). According to the statistics, Internet sales are more common the larger a business is. Among the smallest enterprises only 10 per cent reported to have Internet sales in the year 2005 and 8% in the year 2007, whereas among the businesses employing more than a hundred persons

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[1] It is noteworthy that of all electronic commerce in Finland and other countries, a majority is still business-to-business commerce via EDI systems between enterprises. For example, in 2005, the amount of EDI sales in Finland was 23 billion euros, which is almost double compared to the amount of Internet sales in 2005. Thus Internet-based commerce is only a part of all e-commerce, and the majority of turnover actually takes place elsewhere (EDI). (Statistics Finland 2006, 42-43). In Finland, 40% of largest enterprises (100 or more employees) used EDI in 2006, while this number was only 6% for small enterprises with 5-9 employees (Statistics Finland 2006, 48-49).

the corresponding numbers were 23% both in the year 2005 and the year 2007 (Statistics Finland 2006, 44; Statistics Finland 2008).

Among the Internet sales, the largest customer group in terms of turnover was other enterprises or organizations, and according to the statistics their share of the overall volume of Internet sales was 86% of the overall value of the Internet sales of Finnish enterprises employing five or more persons in 2005. The share of the sales to households, in turn, was then 14% of the total Internet sales. (Statistics Finland 2006, 46.) This illustrates the importance of business-to-business (B-to-B) markets in e-commerce. Nevertheless, the proportion of the sales to households has also been growing, since in 2003 it was still only 7% (Statistics Finland 2004, 34). An interesting finding was also that for most enterprises, the volumes of Internet sales are still relatively small, and in the year 2005 only 29% of the enterprises that had Internet sales made 10% or more of their turnover by Internet sales, and only 11% of enterprises made 25% or more of their turnover by Internet sales (Statistics Finland 2006, 45). Still, these figures have been increasing, since the corresponding figures were only 20% and 5% in the year 2003 (Statistics Finland 2004, 33).

In 2005, the value of Internet sales, calculated from the Finnish enterprises' own estimates and inflated to the level of all enterprises, amounted to approximately 12 billion Euros (Statistics Finland 2006, 43). The rise in two years (since the year 2003 and its estimate of 10 billion euros (Statistics Finland 2004, 34)) was approximately 2 billion Euros, which can be considered as a relatively high growth rate. In 2005, the proportion of electronic commerce in the turnover of Finnish enterprises was 14%, which is equal to the figures of Germany, Sweden and Norway. In European comparison, this is the fifth largest figure after Ireland (18%), France (17%), United Kingdom (17%) and Denmark (17%). (Statistics Finland 2006, 42.)

From the statistics, it can be overall concluded that the use of the Internet has become common also in smaller businesses, but the pace of starting own electronic commerce activities seems to be considerably slower. Further, the size of business and the interest to e-commerce solutions still seem to correlate. This is in line with several studies that have shown that firm size is an important factor, and small businesses lag behind large firms in their intent and decision to adopt e-commerce (e.g. Eriksson, Hultman & Naldi 2008; Stockdale & Standing 2006; Teollisuus ja työnantajat 2000).

Also, the share of enterprises with own www-pages and e-commerce interest has been observed to be dependent on the business sector. Still, according to Finnish surveys, a majority of enterprises has estimated the importance of the Internet to be high or at least relatively high for their business. According to a Finnish survey that was conducted in the late 1990s, only a tenth of SMEs felt that the Internet will not have any meaning for its business, and the importance of the Internet was anticipated to increase in the future (Karttunen, Puhakainen & Rajahonka 2000, 47). The importance of the Internet was considered highest in the service-sector, which was followed by commerce and manufacturing industries (Karttunen, Puhakainen & Rajahonka

2000, 15). Also, it has been observed that the level of take-up by customers and also suppliers may have an effect on a firm's adoption of and commitment to e-commerce (e.g. Stockdale & Standing 2006).

Although there seems to be a relatively constant increase in the take-up figures, it is worrying that a part of especially smallest enterprises seems to be leaving completely out of the Internet development. Kleindl (2000, 73-75) has argued that unless SMEs start to utilize the Internet, they are in serious risk to get left behind, since earlier Internet adopters can benefit from developing knowledge, skills, cost benefits and competitive advantage in comparison to late adopters. According to research results, a common reason for not adopting the Internet or e-commerce is the lack of resources and qualifications, which emphasises the need for finding solutions to these challenging questions. Anyway, it can be argued that those enterprises that fall behind the learning curve may be burdened with competitive disadvantages (Karagozoglu & Lindell 2004, 300).

Also related to the findings above, there is a growing concern of how to make electronic commerce increasingly suitable and adoptable for SMEs. For example, the European Union (2002) has argued that to promote this, there is a need for:

- Improving both technical and management skills in SMEs
- Making appropriate solutions for SMEs available
- Addressing security and privacy issues
- Providing SME-specific information (to help in e-commerce investment decisions)

Overall, the European Union has highly emphasised the role of qualified and competitive personnel, and sees the development of e-business to increase the demand for individuals with creativity and high-level conceptual skills enabling enterprises to increase productivity and produce greater economic value. This requires actions in several areas, but primarily in education, training and enterprise & labour policies (European Union 2002). Since it is most likely that in the future there will be very few business sectors where the Internet and e-commerce would not have any meaning, it would be important also for the smallest enterprises not to "drop out", but instead consider different options, and try to analyse and anticipate their own opportunities, challenges and requirements in electronic markets. Further, this could help them to evaluate different potential e-commerce business models, set and follow up e-commerce objectives and goals, make competitiveness and success comparisons etc. to continuosly develop e-commerce activities and their successfulness (c.f. Horsti 2007, 60).

2.3.2 Motives and barriers of electronic commerce in SMEs

As described earlier, there are a number of special characteristics that distinguish SMEs from larger enterprises, including the number of employees, size of turnover, market share and the management and ownership in an

independent and personalized way. A distinctive feature of the sector is also the determining influence of the owner-manager's behaviour on the organisation's dynamics and performance. (Barry & Milner 2002; Littunen 1998; Storey 1999.) Many of these characteristics also affect the position and opportunities of different SMEs in electronic commerce.

Characteristic SME weaknesses, like a lack of time, resources, technology, and typically short-term planning perspective, can cause problems for SMEs in using new technology-based solutions, including e-commerce, and hinder their innovation and adaptability possibilities (c.f. Barry & Milner 2002; Kamel & Hussein 2004). In any case, the development of the Internet has been argued to provide new, never-before-seen opportunities also for SMEs. Through the Internet, they can develop their businesses to new directions, and also do increasingly international business. At its best, the Internet has been seen as a medium that can be strongly utilised also by SMEs, e.g. in marketing and brand building, actual commercial transactions, supportive activities, as well as collection of improved market information (e.g. Järvinen 1998).

In research, it has been found out that most important factors motivating and driving the adoption of e-commerce are typically organizational readiness (e.g. top management support), external pressure (e.g. demands from trading partners) and perceived expected benefits (cost savings or performance improvements). On the other hand, important barriers to adoption have been found to be hesitation about potential returns on investment and the perception that products are not suitable for e-commerce. In their research, Eriksson, Hultman & Naldi (2008) also refer to the fact that several studies have explored many small business managers still to lack knowledge about the potential benefits of e-commerce, which keeps them from getting involved.

In general, important motives for starting and developing electronic commerce in SMEs are expected economic gains. It can be said that SMEs typically adopt new technologies based on their self-assessments of how they will change "bottom-line" profitability of their business (e.g. Barry & Milner 2002). In principle, electronic commerce can provide true opportunities both for the growth of business and significant cost savings (c.f. Tuunainen 1999). In literature, the following kinds of potential benefits have traditionally been listed to be enabled for enterprises by electronic commerce:

- Quick connections of also smaller enterprises to wide (global) markets
- Quick transactions
- Decreasing costs of customer acquisition and customer relationship management
- Increasing revenue potential of customerships
- Decreasing transaction costs as a result of more efficient supply chains
- Improved flow of information and information management systems
- Potential for new business opportunities and pricing systems
  (Aalto et al. 2000; Amor 1999; Kalakota & Whinston 1996; Karagozoglu & Lindell 2004; Kettunen & Filenius 1998; Schubert & Ginsburg 2000; Teollisuus ja työnantajat 2000; Tuunainen 1999)

The listed benefits are partly related to the real-time and global nature of the Internet, and e-commerce and supporting technologies may enable enterprises to capitalise the opportunities resulting from the globalisation of business (c.f. Levitt 1983). Hence, it has been argued that electronic commerce can help businesses to eliminate the barriers of distance. Also, new opportunities to streamline production and distribution processes and shorten the value chains of products have often been presented as potential benefits and sources of cost efficiency and competitiveness for businesses. In a good case, SMEs may also utilize e-commerce to reduce their purchasing costs. In principle, e-commerce provides a low transaction cost environment where search, price and terms negotiation, payment and settlement related costs decrease significantly, and also the information asymmetry advantages by the suppliers are diminished. Thus, enterprises could have improved market information, and they could order raw materials more directly from distributors, to compare prices, distribution times etc. On the other hand, enterprises can also shorten the supply chain to the direction of their customers (e.g. To & Ngai 2006). Traditionally this chain has often involved a number of intermediaries that all normally add costs, and raise the customer price of the product. In e-commerce, enterprises have an opportunity to sell more directly to customers, which can result in improving efficiency and cost savings. This may lead to increasing returns, or alternatively increasing customer surplus if the prices are lowered as a result of cost savings (c.f. Lucas 2002; Smith, Bailey & Brynjolfsson 2000; Strader & Shaw 1999).

At its best, electronic commerce can also improve the opportunities of enterprises to build and maintain their relationships with customers, and thereby enhance competitiveness. Also, it can provide cost savings by new opportunities to integrate and improve effectiveness and efficiency of many business activities (e.g. Daniel 2003, 235). In positive views, electronic commerce has thus been argued to reduce costs, boost productivity, and also to help enterprises manage change more effectively. A very important benefit has been seen to be potentially improved communication with both customers, suppliers, business partners and competitors (Fillis, Johansson & Wagner 2003). In addition, e.g. Poon & Swatman (1997) see one of the biggest advantages also to SMEs to be the ability to access a vast information infrastructure, and thereby information that was not earlier available. Overall, in literature, it has been speculated that by electronic commerce SMEs would be able to capture global markets, sell to international customers and compete favourably with large corporations.

Amit & Zott (2001) have identified four synergistic sources of e-commerce value to enterprises as efficiency (e.g. lower transaction costs), complementaries (e.g. process integration), lock-in (e.g. customisation and personalisation opportunities to try to increase switching costs) and novelty (e.g. stimulating new ways to conduct transactions). All these are based on mutual gains between enterprises and customers (Jones, Hecker & Holland 2003, 291). In a Finnish survey by Karttunen, Puhakainen & Rajahonka (2000), SMEs felt the

most significant opportunities of the Internet to be faster information flow, ability to have more efficient customer feedback systems, ability to acquire new cooperation partners and create new ways of cooperation, as well as the opportunity to have a wider market area.

In turn, in the surveys of Statistics Finland, the most important motive to start Internet sales has been willingness to improve services, which was considered significant by about two thirds of enterprises. About a half of enterprises also considered image-based reasons, finding of new customers and safeguarding of overall competitiveness as significant motives. The other motives included wider markets, more efficient processes, launching of new products, and reduced costs, but there was a lot of variation in the opinions of the enterprises, and these motives were considered significant by some enterprises and not at all significant by others. (Statistics Finland 2003, 181). Thus, it must also be pointed out that the potential benefits may vary between industries and business sectors. In addition, at least a part of benefits can be questioned, and the assumptions behind the realisation of them can be criticised. In fact, many SMEs seem to remain unsure of the benefits they could achieve by e-commerce, and the confidence in the realisation of them has found not always to be high (e.g. Stockdale & Standing 2006). For example, the idea of decreasing costs of customer acquisition is not necessarily realistic, since although the Internet presence does not necessarily require high costs, it may require considerable marketing efforts to get potential customers to find, visit and order from a specific web site. On the other hand, the fact that e-commerce also provides new opportunities to customers can sometimes be problematic from the viewpoint of enterprises. Namely, typical e-commerce benefits to customers include potential to save time, increased supply of different kinds of products, improved market information, and also a potential for economic savings as a result of increased competition which may put increasing pressure on many Finnish SMEs (e.g. De Kare-Silver 2000; Heikkilä, Kallio, Saarinen & Tuunainen 1998; Heikkilä et al. 2000; Hyvönen, Järvelä & Piiroinen 2008; Kettunen & Filenius 1998).

Overall, the idea of Internet commerce to be of benefit to "all" small enterprises has sometimes been taken too much as an implicit assumption without further questioning the content of this assumption (c.f. Ramsey et al. 2003, 262). It has been noted that small enterprises will not take up new technologies unless they perceive an advantage to do so, or an immediate disadvantage to not do so (Clarke 1997; Lawson et al. 2003, 266). In practice, many enterprises still remain sceptical, and electronic commerce might in fact not always be beneficial for them. Thus, it must be remembered that to become involved in electronic commerce is not without risks either. An example of a questionable benefit from the viewpoint of many SMEs is more efficient markets, for example due to better comparability. As these typically intensify competition, they often benefit buyers more than sellers (e.g. Janson & Cecez-Kecmanovic 2005; Ratnasingam 2008). Actually, e.g. Porter (2001) concludes that increased adoption of the Internet will most probably lead to increased

competition within markets, and consequently also small enterprises may become exposed to more competition than ever before. Porter (2001) also suggests electronic commerce to reduce the difference between competitors' offerings, and as a result of more transparent prices to migrate competition increasingly to price, rather than product features or brand perceptions. This idea, for example, makes quite problematic the idea that by the use of electronic commerce SMEs would be able to capture even global markets, sell to international customers and compete favourably with large corporations (e.g. Ramsey et al. 2003). As Porter (2001, 66) argues, it is a paradox of electronic commerce that its potential benefits, such as increased information, potential reductions in purchasing, marketing and distribution problems, and new opportunities for both buyers and sellers to find and transact business with one another, may also make it difficult for enterprises to capture these benefits as profits. Still, competitive advantage and profit considerations in the adoption of e-commerce are crucial for SMEs, since they have limited financial resources to experiment with new approaches and a limited cushion for failure (Karagozoglu & Lindell 2004, 291).

In literature, a reorganisation of product value chains and changes in the roles of traditional intermediaries/middlemen have also been speculated as potential consequences of electronic commerce. E-commerce may provide producers with new direct-to-customers channels, and this has been anticipated to potentially diminish the role of intermediaries in marketing and sales channels (e.g. To & Ngai 2006, 1137-1138). Especially, in the case of digitalisable products that can be distributed directly over the Internet, the role of many traditional parties may change or disappear. This is already partly visible e.g. in music and video business, game business, ticket business etc (e.g. Tinnilä et al. 2008, 13). However, from the viewpoint of SMEs, especially in commercial sector, these developments can cause serious problems, since the role of them has in many cases been the one of traditional middlemen. If and when customers increasingly order products e.g. directly from producers, the only potentially needed intermediary may be a specialised company taking care of logistics and product distribution. In the case of digital products, also this intermediary becomes unnecessary, which can again cause a number of SMEs to lose the "right to exist".

On the other hand, electronic commerce may also result in an appearance of new kinds of parties and intermediaries in value chains (e.g. Giaglis, Klein & O'Keefe 1999; Tinnilä et al. 2008; Wise & Morrison 2000). In fact, electronic business opportunities may in some cases lead to increasingly complex value creation processes, where networks of very specialized partners work together to provide higher customer value than has been enabled by traditional value creation models (e.g. Castells 1996; Hamel 2002; Järvelä & Tinnilä (toim.) 2000; Shapiro & Varian 1999; Tinnilä et al. 2008). From the viewpoint of SMEs, these developments can provide new opportunities for certain kinds of specialized enterprises, e.g. potential brokers, aggregators, exchangers or infomediaries (Lähteenmäki & Tinnilä 2006; Tinnilä et al. 2008), but may take away

opportunities from many more traditional enterprises, which can partly explain the scepticism and even fear that some small enterprises still seem to have towards electronic commerce and its consequences. Nevertheless, increasingly networked ways of doing business can also force SMEs to adopt e-commerce, since it has been found that inter-locking relationships among partner firms and inter-dependencies in operations and strategies drive enterprises to adopt e-commerce or e-business practices if their suppliers or buyers have also adopted them (e.g. To & Ngai 2006, 1136).

Anyway, both statistics and studies suggest that there is still a relatively large number of enterprises that resist the move to electronic commerce and continue to focus only on more traditional methods of carrying out their businesses. Many SMEs have not entered electronic commerce, and typically micro enterprises have been least likely to get involved. On the other hand, as already mentioned, in many of those SMEs that have entered electronic commerce, the expectations have not been fully achieved (e.g. Poon & Swatman 1997). The reluctance of many SMEs towards e-commerce may result from resource limitations that have a negative impact on their business strategy development, as well as perceptual and physical barriers to business development and growth (e.g. Chapman et al. 2000; Fillis, Johansson & Wagner 2003, 337; Van Beveren & Thomson 2002). Also in electronic commerce, there can be some substantial barriers to entry. First, the real start-up and maintenance costs of electronic commerce may turn out surprisingly high. As information technology investments are still relatively more expensive for smaller enterprises, they may have difficulties in meeting these costs and expenses (Lawson et al. 2003, 266).

Organisational readiness in terms of financial and technological resources has been found as an important factor behind e-commerce adoption and development in an SME. Here, financial readiness refers to the capital available for initiating and financing the costs of adoption, and technological readiness refers to an enterprise's capability to have sophisticated IT systems, sufficient support for employees and competent technical staff (To & Ngai 2006; c.f. Kamel & Hussein 2004; Stockdale & Standing 2006). Also related to organizational readiness, the most important barriers to electronic commerce of SMEs have often been identified as a lack of time, a lack of information, and a lack of training (e.g. Granholm 2001; Lawson et al. 2003). Enterprises may be afraid of increased workload involved in establishing electronic commerce related processes, the time resources required for these activities, as well as potential technical difficulties (Fillis, Johansson & Wagner 2003, 337). Overall, making a full use of e-commerce would take time and investments, and relies on the qualifications and skills of the personnel within an enterprise (c.f. Lawson et al. 2003; Chitura et al. 2008; Lucas 2002). According to Lawson et al. (2003, 266), doing successful business by e-commerce would typically require staff with expertise in the new technologies, but the insufficient skill level of the personnel staff will affect decisions about moving to doing business online. Particularly if the level of skill is low or problems have been experienced in

personnel training, it may have formed a barrier. It also turned out that especially small organizations relied strongly on in-house training with internal people, and often used the strategy of sending one staff member to an external course, who was then responsible to pass on the knowledge to the others. Anyway, Lawson et al. (2003) found that many of the case study organizations experienced a growing need for employing staff with improved computer literacy and appropriate IT knowledge.

Additionally, an important barrier has turned out to be the feeling of the lack of personal contact between enterprises and its customers, and also an idea that customers were not ready to do commerce or business on-line. Low awareness of appropriate information sources has also been found to be a problem, and policy initiatives to promote electronic commerce in SMEs should take this also into account (c.f. European Union 2002). Still, enterprises also face various other problems that reduce the possibilities of the Internet sales as an opportunity for them. Most common problems include the strong position of traditional delivery channels, inappropriate products for Internet sales, non-readiness of customers to Internet shopping and the high start-up and maintenance costs of Internet commerce systems. Especially the enterprises that have not started their own Internet sales have also found out to be worried about the problems in logistics. (Statistics Finland 2003, 181-182). Overall, there still seems to be a large number of potential issues found to inhibit SMEs in their e-commerce uptake. The basic issues have largely remained the same since the advent of e-commerce, and consequently it has also been argued that instead of reinventing the list of e-commerce adoption barriers, more focus should be put on how SMEs could overcome these barriers and reap the benefits of e-commerce (Chitura et al. 2008, 10).

An important resource and force for supporting business development is entrepreneurship, here defined as the discovery and exploitation of potentially profitable opportunities (Shane & Venkataraman 2000, 217). An interesting attempt to explain electronic commerce market-orientedness is based on entrepreneurial orientation. An owner's entrepreneurial enthusiasm for developing business by the help of technology has been identified as a major motivator in SME adoption of e-commerce (Stockdale & Standing 2006). If and when e-commerce is seen to involve profitable opportunities, according to this approach, enterprises with a high degree of entrepreneurial orientation will be more likely to develop interests in it than their more conservative counterparts. Here, the reasons behind the acceptance or dismissal are seen strongly related to factors such as attitudes, behaviour, competencies, culture and values of the owner/manager and the firm as a whole (c.f. Fillis, Johansson & Wagner 2003; Koiranen & Ruohotie 2001).

It has also been pointed out that entrepreneurial behaviour with market orientation and willingness to expand knowledge and information base can lead to fast learning and good returns from innovative products and processes (c.f. Jones, Hecker & Holland 2003, 289-290). For example, in enterprises where top managers believe that e-commerce or e-services offer a strategic

opportunity, their beliefs may serve as a trigger to use time and energy to develop these issues and aim to benefit from them (Scupola 2008, 81). On the contrary, it has been argued that risk averse owner/managers who focus on more conventional business methods, and often also exhibit fewer competencies than their more entrepreneurial colleagues, are more likely to hesitate and also perceive difficulties with e-business (Fillis, Johansson & Wagner 2003, 338; c.f. Salwani, Marthandan, Norzaidi & Chong 2009).

Overall, although there are a number of opportunities, there are also barriers and risks that slow down the development of electronic commerce activities, and also wider electronic business activities, in SMEs. Enterprises have also been argued not to fully understand full potential benefits of e-business along the full chain from supply and procurement ("upstream") to sales and customer management ("downstream") (e.g. Ramsey et al. 2003, 251-252). Electronic business opportunities, in wide meaning, can at their best be utilized in basically all business processes, e.g. in order and billing systems, production planning and control systems, management of product information, marketing, sales, customer service, product development, information transform and communication etc. One increasingly important area to utilize electronic business systems is information management. Also therefore, it is worrying, if a group of SMEs will be completely left out of these developments, since the role of information as a competitive advantage has been anticipated to be further growing.

2.3.3 Electronic commerce and its development paths in enterprises

Despite certain barriers that prevent the entrance of some enterprises to electronic markets, electronic commerce seems to be becoming an increasingly important element in the daily business of an ever growing number of companies and also SMEs. The use of the Internet can be seen as a strategic part of business operations, and it has been claimed that the position of an enterprise as a respectable business partner may even be endangered unless it is interested in the development of e-commerce solutions (e.g. Amor 1999; De Kare-Silver 2000). This view is based on the image that business will be more and more predominantly conducted online in the future, and organizations that do not embrace the new technologies will be left behind (Lawson et al. 2003, 265).

Electronic commerce has been illustrated to offer a wide range of strategic opportunities, and the well-designed use of IT technologies has been argued to improve business processes and communication both within organizations and with trading partners (Lawson et al. 2003, 265). Still, research shows that just like the overall adoption of e-commerce, the depth of its solutions varies strongly according to size of the enterprise, exporting activity, awareness of benefits, type of customers and its imposition by large trading partners (e.g. Poon & Swatman 1997; c.f. Chapman et al. 2000; Ramsey et al. 2003). There may also be differences in regional e-commerce activities, although research on small businesses across geographical areas has showed that small businesses in rural

areas have also developed their e-commerce activities (e.g. Eriksson, Hultman & Naldi 2008).

The diffusion processes of electronic commerce in SMEs have followed varying paths, also depending on the chosen strategy, business models, history etc. (e.g. Lucas 2002). Enterprises can be found in all of the following groups: early adopters, those who are aware, and those who are not aware of electronic commerce and its opportunities (c.f. Lawson et al. 2003, 274). Especially earlier, it was highlighted that early adopters, the proactive entrepreneurial market makers that first seize the opportunity, can gain business advantage in electronic markets the same way as early market entrants in other markets (Fillis, Johansson & Wagner 2003, 337-338). However, this has not always turned out to be the case, which has led to a growing questioning of this idea.

There is a number of models that have been developed of the stages that an organisation moves through when embracing electronic commerce (e.g. Poon & Swatman 1997; Prananto, McKay & Marshall 2004). These models exemplify the phases involved in moving toward greater sophistication in electronic commerce solutions. Poon and Swatman (1997, 398-399) have developed a well-known hierarchical model for the development levels of electronic commerce in SMEs:

- At the first level, enterprises develop inter-organisational electronic commerce services without integration with their existing systems.
- Next, enterprises develop limited integration with their existing systems.
- At the third and highest level, enterprises undertake full integration.

The above model is distinct from the one that has been traditionally witnessed in the development of information systems, and turns the traditional model "inside-out", since inter-organisational connections precede intra-organisational connections (Daniel 2003, 233-234). From another viewpoint, the idea of stage-based models can also be presented so that an organization first uses electronic commerce purely for informational purposes, then transactional purposes, and ultimately progresses to having a highly strategic focus on e- commerce (and other e-business) activities.

The presented-type of models have been criticised for automatically assuming that the necessary business process reengineering capabilities exist to proceed in stages. However, this is not often the case in SMEs. Therefore, though there has been a lot of talk about the need to have an integrated approach to e-business, even for the majority of SMEs e-commerce solutions may remain relatively simple also in the future, and simple solutions may also be most relevant for the purpose of the enterprise (c.f. Ramsey et al. 2003, 262). In real life, the majority of SMEs may never want to proceed to the highest stages, but remain in lower-level sophistication and lower requirements in their e-solutions. Also, it should be noted that already Poon & Swatman (1997) were highlighting the possibilities of differences in the degree of electronic commerce depending on industry and product factors (c.f. Chapman et al. 2000).

The models can also be criticized to assume a linear-type of progression from being less mature in electronic commerce to increased sophistication over time. In practice, however, SMEs may typically follow a non-linear or discontinuous path in their e-commerce development (c.f. MacGregor 2004; Ramsey et al. 2003, 251-252). In fact, the diffusion and assimilation process of e-commerce in SMEs has often turned out to follow a "zigzag" path (e.g. Ramsey et al. 2003). It has been found that small enterprises may have a strong penetration of web site and e-mail use, but more advanced applications are not so broadly applied (e.g. Stockdale & Standing 2006). Several studies have suggested that typically pragmatic and cost-cautious small business owners tend to adopt e-commerce in smaller steps (e.g. Daniel, Wilson & Myers 2002; Eriksson, Hultman & Nandi 2008). The development process is often also characterized by a "trial and error" approach, instead of systematic linear development. This is partly due to the fact that the staged linear approaches would require a careful and systematic strategic planning process of e-commerce in a dynamic and unpredictable environment, which may be problematic for small enterprises.

One further fact to be pointed out is also that presented stage models are sensible mostly only in the case of enterprises that also have other than electronic commerce activities. Instead, for SMEs that start from electronic markets and have e-commerce focus and a new e-market based business model from the start, the approach does not often fit so well (e.g. Lucas 2002). Anyway, it has been argued that at least the capability to inform customers via the internet about the products and services offered is often already considered as a business prerequisite (e.g. Eriksson, Hultman & Naldi 2008).

2.3.4 Strategic business viewpoints on the role of e-commerce in SMEs

Despite the basic understanding, many companies and enterprises have not yet found the solutions on how they could best exploit the opportunities of the Internet. It is interesting to see that many entrepreneurs seem to share quite a pervasive vision about the importance of the Internet at a general level, but still they often do not have the ability to translate such a general vision into a clear and specific idea of how to utilise it in their business (c.f. McGowan, Durkin, Allen, Dougan & Nixon 2001). As an example, in her research, Granholm (2001) found that only one fifth of SMEs in South-West Finland had set clear goals for e-business and made future development plans for it.

As pointed out earlier, it has been noticed that investments in the development of e-commerce activities do not automatically bring business success and prosperity, and SMEs do not necessarily understand how they could really operate their businesses more efficiently or cost-effectively by the use of e-solutions (c.f. Poon & Joseph 2000). In spring 2004, in Finnish companies and enterprises, the three most important problem areas were considered to be that the focus is still on more traditional sales and delivery channels, customers are not ready to Internet commerce, i.e. still prefer more

traditional channels, and uncertainty about payments. Important problems also included the fact that products were not seen suitable for selling via the Internet, too high implementation and/or maintenance costs, uncertainty concerning the legal framework, and not surprisingly also problems connected with logistics. (Statistics Finland 2004, 35) Although the potential benefits have been well documented, there thus still seems to be a paucity of information on how to develop a good strategy and to implement e-commerce successfully in enterprises and their operations (e.g. Jones, Hecker & Holland 2003).

According to DeCovny (1998, 40), insufficient ability to integrate electronic business and overall business strategies is one of the main barriers for the development of e-business in SMEs. Also in Finland, e.g. Berg (2004), Ruohonen (2005) and Tuunainen (1999) have stressed the importance of integrating the development of e-solutions to the overall strategic and operative development of an enterprise. Also Willcocks & Sauer (2000, 4) and their "onion model" with five levels of electronic business development is an example of a model that emphasises the strategic side. The basic idea of the model is that enterprises should seek for e-commerce or e-business solutions that are deeply connected to enterprise's strategy in order to gain benefits and develop a long-term competitive advantage.

In electronic commerce, it has been seen that the business climate can change very quickly and radically, and there are always elements of uncertainty in the markets. As a result, the risk of failures is real also in the future, and there is still room only for a limited amount of enterprises in the same field. The future markets of electronic commerce are most probably characterized by a strong competition and only good enterprises with absolute competitive advantage are considered likely to survive (e.g. Porter 2001). On the other hand, it has been pointed out that an important reason for a failure in electronic commerce has often been the lack of a clear e-commerce strategy (Ramsey et al. 2003, 252). For example, Chaston (2004), Evans & Wurster (2000), Karagozoglu & Lindell (2004) & Porter (2001) have highly stressed the importance of clear strategies on how to deploy the Internet in business, and a strategy that determines where to go should preceed determining how to get there.

Despite the observed importance of a good strategy, only a worryingly small part of SMEs has been found to have a systematic e-commerce strategy (e.g. Barry & Milner 2002, 321; c.f. Granholm 2001) and a remarkable number of SMEs may have adopted e-commerce without a deep thinking of its strategic aspects. Still, as pointed out, systematic strategy work has been commonly seen as a necessary prerequisite for successful activities in electronic markets, just like in the case of traditional markets (e.g. Amor 1999; Cannon 2000; Kalakota & Robinson 1999; Porter 2001).

Related to the development of an e-commerce strategy, Ghosh (1998) has determined three main ways by which companies can provide their services by the use of Internet-technologies:

- Simply provide in the Internet the same basic service that is provided by traditional sales personnel.

- Personalise Internet activities and interaction according to customers, and hereby try to build increasing customer loyalty.
- Provide new kinds of services with a low price, e.g. give answers to commonly interesting questions on the company's homepages.

The above described three alternatives are one way to approach different options for e-commerce exploitation. The three alternatives can also be tried to combine to seek new kinds of competitive advantage. All in all, it can be said that by investing in the new electronic channel, enterprises can try to decrease traditional costs related to sales, marketing and services, but at its best the Internet may also provide new opportunities to offer better service quality without substantial extra costs.

As a part of strategic development, an enterprise should carefully consider what kind of business model would be the best and most suitable for its e-commerce operations. Rayport & Jaworski (2001) define a high-quality Internet-based business model to meet the following criteria:

- to be unique
- to provide links between capabilities and benefits
- to support links between enterprise's activities and capabilities
- to be mutually reinforcing
- to provide a link between the physical world and the virtual world
- to make sure that resources are capable of supporting a sustainable advantage.

The list is demanding, and in practice it has often turned out problematic to develop very successful e-commerce business models, especially in the case of SMEs with limited resources. Many entrepreneurs and managers of SMEs still have to struggle with limited financial resources, limited time, but importantly also from scarce human resources and inadequacies in knowledge and skills (c.f. Daniel 2003; Eriksson, Hultman & Nandi 2008; European Union 2002; Lawson et al. 2003). Although there has been a growing interest in the strategic use of information technology by SMEs, it must thus be remembered that the development of e-commerce and e-business may require substantial financial and human investments from enterprises (e.g. Berg, Karttunen & Rajahonka 1999, 22). Therefore, it can be considered only rational that before choosing their solutions, enterprises carefully assess the costs and benefits before their final decisions.

The development of a strategy for e-commerce (or e-business in wider meaning) can also be seen as a process with a number of complementary phases (e.g. Aalto et al. 2000, 38-42; Chaston 2004). In new start-ups that enter straight to electronic markets (e.g. so called "dot coms"), it is important to first carefully define and plan the basic business logic, business objectives, business processes etc. In turn, for the enterprises that have also participated in more traditional markets and aim to expand their operations to electronic markets, a key question is to define the role of e-commerce in the overall business concept. Here, holistic planning is important, and an enterprise should determine an e-commerce strategy and practical solutions that are well-suited for its wider

business objectives, needs, and development ideas (c.f. Amor 1999; Berg et al. 1999; Chaston 2004; Lucas 2002).

An empirical study by Straub & Klein (2001) identified three progressive levels to which companies evolve in their attempts to pursue e-commerce strategies. At the initial level, the focus is mainly on cutting costs and/or raising productivity. At the next level the focus shifts to the use of e-commerce to access new customers and markets. The third level builds upon gains at the previous levels, and enterprises or companies seek sustainable competitive advantage by attempting to achieve a complete integration of e-commerce into the company's overall business strategy. Most of the large companies were found to have resources to advance to the third level, whereas SMEs focus on the first and second levels. Also, it should be remembered that the third level objectives reflect greater complexity and risk. Therefore SMEs may also often be less likely to pursue them, due to their relatively limited ability to absorb the risks.

In Finland, Tuunainen (1999) has divided the main business strategy alternatives of enterprises and enterprise networks to two main groups. These can be named as competing with cost and competing with service. According to Tuunainen (1999), competing with cost suits especially well to enterprises that sell standard products, whereas competing with service is especially suitable for enterprises with more specialized products. On the other hand, however, these strategies do not exclude one another, but rather they should seen as a description of different main routes towards deepening levels of business process integration in different product value chains (see Tuunainen 1999).

An important thing to remember is that SMEs, and especially small businesses, are diverse. Some are dynamic and flexible, with a great power to innovate, whereas others are more traditional, based on family involvement and embedded in local business environments. Furthermore, it should be remembered that in e-commerce markets, other enterprises are start-ups that enter the new markets, whereas others may already have a long experience from more traditional markets. SMEs operate in a great diversity of industries and business sectors, and electronic commerce may be more suitable to some of them than the others. As an example, there may be considerable differences between business-to-business (B-to-B) and business-to-consumer (B-to-C) markets. As pointed out earlier, at present the overall volumes of electronic commerce are strongly concentrated on the B-to-B side (e.g. Aalto et al. 2000; Statistics Finland 2006). Internationally, it has been estimated that approximately 90-95 % of worldwide e-commerce would be B-2-B commerce (UNCTAD 2004). The dominating role of B-2-B commerce can be explained by the increasing role of electronic procurement, as well as the high volumes of B-2-B transactions in the overall worldwide trade.

In B-to-C markets, a successful strategy is often even more complicated to plan and implement than in B-to-B markets. Typically, one important point here is marketing, and since especially small enterprises do not often have substantial marketing resources, there is a need for innovative solutions (e.g. Amor 2000; Cannon 2000). Strategic decisions are thus also needed on the extent

of marketing investments and their allocation, for example also on centralised commerce sites or portals, and the costs should be weighted against the potential benefits. A strategic decision is also related to the organising of an enterprise's e-commerce infrastructure, and there are also application servce providers (ASP) that can be considered as an option. From the viewpoint of small enterprises, an advantage of ASP services is that by using of them they do not necessarily need such a large-scale IT infrastructure of their own, but there are also disadvantages, including the dependency on the service provider.

In B-to-B commerce many of the problems of business-to-consumer commerce can be avoided: often the buyer and the seller know one another, commerce is based on trustworthy business relationships etc. Also, despite the fact that a growing number of centralized Internet commerce portals for B-to-B bidding and tendering have been emerging (e.g. Wise & Morrison 2000), companies and enterprises may have traditionally been investing in the systems and knowledge of electronic data interchange (EDI) and electronic transactions, which is still a much more common form of commerce in B-to-B side than Internet-based e-commerce. As a result of the nature of the markets, B-to-B commerce can often be based on more closed systems and can be more easily restricted by passwords, done through extranet systems etc. than is the case in the B-to-C markets. Usually, electronic commerce in the B-to-B markets is overall less risky than in the B-to-C markets.

By summarising and concluding the ideas of earlier literature, it can be said that the strategic choices related to electronic commerce in an enterprise seem to be affected by the following basic factors:

- **Size of an enterprise and the volume of its business**
  - small enterprises vs. large companies
- **Stage of the e-commerce life cycle of enterprise and its earlier experience**
  - enterprises starting e-commerce vs. enterprises that have done it already longer
- **Life cycle of an enterprise and the role of e-commerce in overall business**
  - e-commerce start-ups ("dotcom's") vs. traditional enterprises that expand/have expanded their operations to e-commerce
  - more offensive new enterprises vs. more defensive traditional enterprises
- **Target group(s)**
  - business-to-consumer (B-to-C) markets
  - business-to-business (B-to-B) markets
  - etc.
- **Industry/business sector and product(s)**
  - digital products or services vs. traditional products or services
  - mass products vs. individually tailored products

In literature, competitiveness of businesses in e-markets (and other markets) has also been argued to be largely related to the economies and efficiency of the product value chains or value networks (e.g. Benjamin & Wigand 1995; Järvelä & Tinnilä (toim.) 2000; Paavilainen 1999; Porter 1987; Porter 2001). In an

inefficient value creation process, the transaction and other costs of the product can be substantially higher than in an efficient process. In principle, e-commerce is most efficient when the order and supply processes go as directly as possible between customers and producers. As an example, in the sales of computers, an increasing number of producers seems to be moving towards direct Internet sales without traditional retail partners (Aalto et al. 2000; Kraemer, Dedrick & Yamashiro 2000). This way, the producers are aiming at cost savings, reduced need for capital, and a better understanding of the needs and expectations of end users by direct contacts. Related to this, so called mass customising of products, where a producer puts the product together from certain elements based on the wishes of a customer, seems to become increasingly popular (Paavilainen 1999, 21). This kind of procedure can also partly help enterprises to remain connected to their end customers, and anticipate and react as quickly as possible to potential changes.

In e-commerce (and e-business), there has also been growingly talk about new kinds of value networks or internetworked enterprises in the electronic business community (e.g. Hyötyläinen, Smolander, Valjakka & Räsänen 1999; MacGregor 2004; Nurmilaakso 2000; Ticoll, Lowy & Kalakota 1998). These strategic enterprise networks are solutions to improve cooperation and organise operations in a new way, and in the future it is expected that there will be increasingly diverse alliances and a growing number of both horizontal and vertical network relations. Simultaneously, it has been discussed that within the networked enterprises there can be an increasing number of virtual organisations for specific tasks or projects, e.g. in the field of product development. However, these kinds of network-based operations require changes in the cooperation culture, and often one of the biggest challenges for enterprises has turned out to be change and unlearning of more traditional ways of doing things (c.f. Hamel & Prahalad 1990; Luomala et al. 2001; Senge 1994).

Electronic commerce of the future has been described to require enterprises to concentrate more on their core competencies and their own role in the entity of networks (e.g. Jenster & Pedersen 2000, 152; Ruohonen 2005, 8-9). This idea has also been illustrated by so called customer-oriented channel model of electronic commerce. The model is based on the idea that there are a number of basic activities (marketing, finance, order, delivery) that are always involved in electronic commerce and can be illustrated as own channel-like processes (see Järvelä & Tinnilä (toim.) 2000, 11). In the customer-oriented channel model, the overall customer services in e-commerce are based on the specialized channels that consist of a number of different organizations and systems and that are designed for the accomplishment of each of these activities. Traditionally, different actors have often tried to coordinate all, or at least most of, the channels themselves, but according to the customer-oriented channel model, different organisations should increasingly specialise in certain channels or their parts, and network together in order to provide the overall service that serves the customers' needs in the best possible way. The tasks in performing the different specialized functions here can also be seen to

determine the roles of different actors in re-organising value chains. (Järvelä & Tinnilä (toim.) 2000, 12-13.) Although increasing networking probably makes the above illustrated way of operating more usual, a quick change to it would require such potentially radical changes in organisational cultures that it can be anticipated that in practice the transition period will usually be quite long (c.f. Luomala et al. 2001).

An interesting question related to value chains and value networks is also the future role of centralised electronic market places. From the viewpoint of enterprises, participation in them can be argued to be reasonable only if increases in income exceed the costs of participating. However, a typical situation in electronic market places seems to be a very hard price competition, which is a result of transparent prices and often strongly price-based decision making of customers. As a consequence, e.g. in B-to-B markets it has been seen that suppliers do not necessarily like to participate in the market places, which then do not often achieve the level of transactions and actors that a profitable business would require (Wise & Morrison 2000). The customers are also supported by more and more developed systems that automatically search through different sites to find the best offers, which makes competing on price very demanding from the viewpoint of SMEs. It has been anticipated that the number of centralised market places in the Internet may decrease in the future, but at the same time there may appear a number of mega market places where an increasing number of commercial transactions concentrate (c.f. Luomala et al. 2001).

2.4 Concluding remarks on SME e-commerce development and its challenges

This chapter has concentrated on the description and illustration of the context of this research, i.e electronic commerce. Further, since this study concentrates on electronic commerce (e-commerce) especially from the viewpoint of SMEs, the later paragraphs of this chapter have had a special emphasis on SMEs and their e-commerce development challenges.

As illustrated in the content of this chapter, SMEs have a number of special characteristics that have to be taken into account, when discussing their e-commerce and also its qualification requirements. Despite the fact that according to the statistics the use of the Internet and also e-commerce has been growing quite steadily in the enterprises of all sizes in Finland (e.g. Statistics Finland 2006), it is still visible that small businesses lag behind large firms in their intent and decision to adopt e-commerce, and typically also the implementation of existing e-commerce solutions (c.f. Eriksson, Hultman & Naldi 2008; Stockdale & Standing 2006). As pointed out, SMEs are typically relatively small business units, where the personnel may still have a limited understanding of e-commerce and its opportunities. Consequently, a number of

SMEs may still hesitate the entrance and development of their business to this area simply because they do not have enough information, knowledge and skills. Overall, resource limitations (especially a lack of monetary resources, human capital resources, training and development resources and time) have been found as significant factors that hinder both the entrance and further development of SMEs in e-commerce. (e.g. Barry & Milner 2002; Eriksson, Hultman & Naldi 2008; Fillis, Johansson & Wagner 2003; Granholm 2001; Lawson et al. 2003; Stockdale & Standing 2006). It is typical for SMEs that they do not have specialised e-commerce personnel, and e-commerce activities should be taken care of side-by-side, and often on the side, of other everyday business activities. Still, a successful implementation of e-commerce requires qualifications from the personnel of a SME, although a part of activities may be potentially outsourced to specialised service providers or alternatively be taken care of by possible network partners of a SME.

Also, it has been found that a remarkable number of those SMEs that have adopted e-commerce stay at relatively low levels of e-commerce development (e.g. Lawson et al. 2003; Lucas 2002; MacGregor 2004; Ramsey et al 2003; Stockdale & Standing 2006), and do not enter potential deeper development stages as eagerly as would be expected by the potential benefits described in the literature. This is also due to the fact that unfortunately many SMEs have experienced that e-commerce has not met its expectations (e.g. Poon & Swatman 1997; Stockdale & Standing 2006). Therefore, it can be argued that in many real life cases the expected benefits may be overexaggerated, and on the contrary the competitive challenges perhaps underestimated. SMEs have also blamed a lack of customer readiness as one of the important reasons for their potentially modest e-commerce success (c.f. European Union 2002; Stockdale & Standing 2006), although, on the other hand, this is one of the factors that can be anticipated to change significantly in the future. Further, what has been observed in a number of SMEs, especially in the case of traditional bricks-and-mortal enterprises, is a fear of losing their market position and perhaps even "the right to exist" as a result of changes in value chains, customer behaviour etc. (c.f. Benjamin & Wigand 1995; Järvelä & Tinnilä (toim.) 2000; To & Ngai 2006; Wise & Morrison 2000) Particularly to these SMEs electronic commerce may thus appear more as a threat than as an opportunity, which may cause them to neglect the issue and have a negative attitude. Naturally, there is then a growing risk that especially these enterprises are reluctant to invest in the development of e-commerce or the required qualifications, which causes serious worries of them dropping out of the future developments and gradually losing their market position and success potential.

Nevertheless, it is also still a fact that although growth has been taking place over time, especially in many sectors of business-to-consumer (B-to-C) commerce the trade volumes have not risen to the levels that were anticipated e.g. during the highest e-commerce hype around the turn of the millennium (c.f. Nurmela, Sirkiä & Muttilainen 2007). Still, it can also be argued that in many sectors the substantial growth of e-commerce has only just begun, and SMEs

have to be prepared for the future. Also, what can be observed is that in the economy and society there are a number of (mega)trends that are likely to have potentially significant impacts on the development of both e-commerce and its demand potential.

To be successful, e-commerce should typically be based on a strategy, which should also be designed so that it supports the overall strategy and goals of the business (e.g. Porter 2001; Tuunainen 1999). What makes the situation even more challenging is that all SMEs are unique, and a relevant approach to e-commerce is always also a highly situational factor. In general, it can be argued that recommendable e-commerce solutions are typically dependent at least on the enterprise size, markets, industry or business sector, the stage of an enterprise's life cycle, as well as the role of e-commerce in an enterprise's overall business concept.

Regardless of the case, at a general level it can be said that in potentially successful e-commerce a SME should be able to manage for example in the areas of marketing and customer relationship management, as well as strategic business development. Also, in addition to business tasks and the qualifications required there, the new e-environment requires appropriate technical solutions that should be e.g. user-friendly, reliable and trustworthy, continuosly updated, and potentially also integrated with the other important systems of the business of an enterprise. Further, in order to remain competitive and hopefully even a step ahead of its rivals, a SME should be able to go forward and continually develop something new, i.e. innovations, in terms of products, but also marketing, sales and customer service, technical solutions, organisation of the business etc.

The list above is highly demanding, but all the above mentioned activities can be considered as those that are typically crucial for a successful long-term implementation of e-commerce and its activities. Then, a very significant question is how SMEs can respond to this remarkable challenge. As defined in its objectives, this study aims to provide answers to this question by analysing the qualification requirements of e-commerce and thereby providing SMEs also potential ideas on what qualifications they should pay special attention to. And further, this study also attempts to provide practically-oriented information on how SMEs could potentially develop the required qualifications of e-commerce, thereby aiming to aid the proactive development of SMEs and their personnel in the constantly evolving e-commerce environment.

3 APPROACHES TO QUALIFICATIONS AND QUALIFICATION REQUIREMENTS

This chapter provides information on qualification and qualification requirements, which is important to understand the research phenomenon of this study. The discussed topics are rich in terms of meanings, and the question of qualifications and qualification requirements can be approached from a variety of approaches (see e.g. Ellström 1998; Mäkinen 1998; Streumer & Bjorkquist 1998). These concepts also have a number of concepts that are close by their meaning and they are also included in the discussion under this chapter. Overall, the aim of this chapter is to deepen a reader's understanding of the research phenomenon, i.e. qualification requirements, which in this study are examined in the context of electronic commerce.

3.1 Qualifications and related concepts

Oxford Business English Dictionary (2005, 442) defines qualification as:

i) an exam that one has passed or a course of study that one has successfully completed
ii) a skill or type of experience that one needs for a particular job or activity
iii) the fact of passing an exam, completing a course of training or reaching the standard necessary to do a job.

Of the above definitions, definition ii) is closest to the meaning that this study concentrates on, and which is also covered in the theoretical framework of this report. Moreover, in should already here be pointed out that in this study qualifications or qualification requirements are analysed mainly at the level of an enterprise (SME), rather than at the level of an individual. Although this has not traditionally been that typical, in this study this has been a deliberate choice, which has been made also to emphasise the importance of qualifications at the level of an enterprise as an entity.

As a concept, qualification has its roots in economics and educational sciences. Qualifications can be seen as factors that combine different kinds of learned knowledge and skills with professional practices. Still, the concept of qualification is not unambiguous, and it can be approached from various viewpoints (e.g. Ellström 1998). It is also noticeable that the concepts of qualification, qualification requirement and competence are used in slightly miscellaneous meanings in research and literature (Ellström 1998; Jaakkola 1995; Ruohotie 2002; Ruohotie 2003). Qualification as a concept has been used widely, when the questions related to know-how, knowledge, skills and professional abilities have been analysed from the viewpoint of the demands of working life. Also in Finland, the concepts like qualification, professional ability and competence have been used in the literature referring to almost similar things. Different interrelated concepts like qualification and qualification requirement have also been determined and interpreted slightly differently in different contexts and frameworks. Based on a number of sources, it can hence be said that the use of these terms is not unambiguous, and a consensus has not been found about the exact meaning of them (e.g. Ellström 1998; Jaakkola 1995; Mäkinen 1998; Nijhof 1998; Ruohotie 2002; Streumer & Bjorkquist 1998; Taalas 1995).

Takala (1983, 10) has defined qualifications widely as the factors determining the readiness of an individual to act in a society. From the viewpoint of labour markets, qualifications can be defined as features that have practical value to be able to successfully manage in concrete work processes (c.f. Hövels 1998; Väärälä 1998). According to this definition a successful work process of an individual requires certain characteristics, i.e. qualifications, which enable the appropriate arrangements of work and the desired end result (Ellström 1998, 41; Ruohotie & Honka 2003, 57). The qualifications of work markets are also not stable, but continuous change is a part of their nature (Hövels 1998, 54; Metsämuuronen 1998, 30; c.f. Streumer & Bjorkquist 1998; Toikka 1984). Accordingly, e.g. Streumer & Björkquist (1998, 250) define qualification as the ability to succeed in changing work tasks by the help of knowledge and skills. Further, qualifications can be defined as knowledge, skills and attitudes that are needed in the dynamic working life and its work processes (c.f. Turpeinen 1998, 17). Qualifications can also be seen as a measurement of what a certain person, team, or organization can do (c.f. Haltia & Kivinen 1995).

Although production and technology oriented qualifications are still necessary for successful work processes, the importance of socio-cultural and innovative qualifications has been increasingly stressed in research and literature (e.g. Ruohotie & Honka 2003; Väärälä 1995a, 1995b, 1998). Here, socio-cultural qualifications refer to the inward and outward relationships of an employee in a work organization. They are typically related to the skills of interaction and social ability to work in different arenas, e.g. teams. Also, the importance of innovative qualifications (or competencies) has been increasingly emphasised when the development of work processes has been analysed

(Ellström 1998, 44; Väärälä 1998, 33). Innovative qualifications refer to an ability to understand one's work as a part of a wider work process, see one's own work as a developing activity, analyse the work and also focus it according to the future needs. Innovative qualifications have also been defined to include abilities of continuous learning and flexible development of one's expertise (e.g. Väärälä 1995a, 46-47). High importance has also been articulated to so called adaptation qualifications, which refer to the themes like work discipline, working time, rules of the work community, and conscientiousness. This is related to the fact that changing and uncertain labour markets have also been said to emphasize the overall control of one's life and personal development (Väärälä 1998, 32).

Metsämuuronen (1998), Mäkinen (1998), Nijhof (1998) and Ruohotie & Honka (2003) present that a good employee of the future is expected to have both overprofessional general qualifications, and the specialised knowledge, skills and technical qualifications needed in her/his own special field. Thus, overprofessional qualifications and work-specific qualifications complement one another. The importance of both groups of qualifications seems to be growing in information society. Nevertheless, it even seems that the focus may be shifting increasingly towards overprofessional qualifications related to wide know-how and the ability for continuous learning (c.f. Ruohotie 2002; Ruohotie & Honka 2003). E.g. Hautamäki (toim.) (1996) has presented that in modern information society, communication skills and an ability to understand and interpret new kinds of symbols are of special importance. In addition, it is considered increasingly important to be able to analyze and interpret information, to learn continuously, to work in teams, and be able to control and cope flexibly with changes (Hautamäki (toim.) 1996, 23-25; c.f. Nijhof 1998; Ruohotie 2002; Tynjälä 2003).

In line with the views above, e.g. Peltonen (1993) has presented that education should focus on the teaching of general learning abilities, creativity, flexibility and the ability to prioritize (c.f. Nijhof 1998; Turtiainen 1997). Nevertheless, teaching of these kinds of metacognitive overprofessional qualifications is often difficult, especially if the learners do not have some basic level of them at the beginning (c.f. Metsämuuronen 1998, 36). In any case, the importance of these qualifications seems to increase in knowledge and information based economy and work processes. In this environment, keys of success have also been illustrated by three i:s: intelligence, ideas and innovativeness. Accordingly, the most important future qualifications have been illustrated as human interaction and conceptual skills, though the importance of industry and work specific skills remains significant (e.g. Kaivo-oja & Kuusi 1999; Kuusi 1996; Nijhof 1998; Ruohotie 2002).

Qualifications can also be defined as areas of professional content that form the professional competence of an individual (Jaakkola 1995, 119). In turn, another important concept, competence can be defined as the ability to do something well or effectively, or a skill needed in a particular job or for a particular task (Oxford Business English Dictionary 2005, 105; c.f. Ellström 1998,

40). Competencies have also been defined as different kinds of characteristics that can be measured and assessed, and that determine the level of effectiveness or success in different work tasks, processes and situations. Atwell (1997) and Kanfer & Ackerman (2005) see the work competence of an individual mainly as an ability to perform successfully, according to certain criteria, the tasks that have been set by and are valued by an organization. Still, in a wider meaning, competence can also be seen as an ability or a set of skills needed for a good performance in one or more life domains (Sternberg 2005, 15).

Streumer (1993) defines the difference between the concepts of qualification and competence by the level of abstractness, and sees competence as a more abstract concept. Accordingly, qualification can be defined as competence, which is needed in a specific work task, and which is implicitly or explicitly determined by the characteristics of an individual. Ellström (1998; 2001), in turn, presents a number of different approaches to vocational competence, and shows that the term can be given many different meanings. The actual requirements of work and official qualification (or competence) requirements set for a certain work position often also differ from one another (Ellström 1998, 41). Official requirements are often influenced by the willingness to raise or maintain a certain status of a certain profession. In turn, actual work requirements are necessary for the successful implementation of real work tasks and processes, and they can differ considerably between organizations even in the same position.

Like qualification, competence is also a highly contextual concept, which is related to the capability of an individual or an organization to work appropriately and efficiently in a certain context or situation (Hövels 1998, 53-55; Kanfer & Ackerman 2005; Kivinen, Hedman, Mäkelä & Metsä-Tokila 2003; Ruohotie 2003; Stasz 1998). The content of competence in a certain work context is determined by work processes and professions, as well as the meaningful objectives and tasks related to them (Kanfer & Ackerman 2005, 336; c.f. Kjellberg, Söderström & Svensson 1998). From another perspective, competence can also be seen as a resource that an individual brings to an organization and a work community (Ruohotie & Honka 2003, 55). Also, like in the case of qualification, it is possible to separate the concepts of formal competence and real competence that may differ also at the level of an individual (Ellström 1998; 42-43). Here, the qualifications that can actually be utilized and developed in work can be called real competence. In an ideal case, these can also be equal to potential qualifications, but usually the restricting or enabling factors of the work environment lead to a situation where this is not the case and individuals are not able to exploit their full potential. (Ellström 1998, 43; Ruohotie & Honka 2003, 54-55; c.f. Kanfer & Ackerman 2005, 336-337).

One way to illustrate professional competence is to divide it to operative and strategic competencies. Here, competencies that are directly related to the successful implementation of current work tasks form operative competencies. In turn, skills and qualifications related to quick learning of new things can be called strategic competencies (Otala 1996, 30-31). Overall, labour market

competence has been defined as a sum of all the factors that influence the positioning of an individual (e.g. Varila 1992). On the other hand, labour market competence is also affected by the labour markets and their structures, and it has turned out difficult to determine what factors finally determine an individual's work market ability. Competence, like qualification, is also a dynamic concept, the meaning and contents of which evolves and changes over time (e.g. Ellström 1998; Kjellberg, Söderström & Svensson 1998). Recently, instead of concentrating only on a narrow, task specific approach, literature has started to emphasise a wider perspective on competencies (e.g. Ruohotie 2003; Ruohotie 2005). E.g. Räisänen (1998) defines vocational competence as the mastery of vocational functions, but also the mastery of large functions and entities. In practice, it has also been noticed that employees often cannot explain their own work processes, or what kinds of qualifications or competencies are needed or used there (Räisänen 1998, 15). Still, competence in the labour markets has been seen as a central factor dividing the future employees to ”winners” and ”losers” (c.f. Castells 1996; Kivinen et al. 2003; Tynjälä 2003). Since the development of labour market competence is beneficial both to individuals, enterprises and the whole society, it is essential to make analyses and find appropriate ways to develop it in the rapidly changing environment.

Also, although qualifications and competencies have traditionally been mainly analysed from the viewpoint of an individual and his/her work processes, changes in the nature of work and work markets have brought about a more collective approach, emphasising the development of collective qualifications or competencies of an organisation (e.g. Aaltonen & Wilenius 2002, 10; Soini, Rauste-Von Wright & Pyhältö 2003, 284-286; Tynjälä 2003, 87-88; Väärälä 1998, 21). Consequently, qualifications and competencies have been increasingly started to be discussed at the levels of work communities, work groups, teams etc. For example, Metsämuuronen (1999) discusses qualifications at a team level, and sees the qualifications of a team as a combination of the qualifications of team members. In this context, persons must be able to flexibly apply their qualifications and competencies to the needs of a team, and be able to cooperate. Hereby, it has also been said that the creation of new combinations of qualifications are needed, and these can be called collective qualifications (Ruohotie 2000, 38).

Like qualifications, also competencies can be analysed both at the individual and organizational level. From the economic viewpoint, it can be argued that organizational aspect is central. Also in this study, qualifications (and competencies) are seen as the capital of organizations, which naturally consists of different individuals and their characteristics. Collective qualifications and competencies of an organisation are seen as a crucial factor determining competitiveness and future success potential (c.f. Ruohotie 2000). From the viewpoint e-commerce success, it is essential that the qualifications of an enterprise and its personnel meet the needs and expectations of customers. Here again, it should be emphasised that qualifications or competencies do not refer only to technical skills or knowledge, but also to other kinds of

knowledge, skills, attitudes, values, experience and individual characteristics (c.f. Kautto-Koivula 1993; Knowles 1990; Ruohotie 2003; Ruohotie & Honka 2003). Like in the case of individuals, qualifications or competencies are something special and specific to each organization, and are connected to a certain specific context (c.f. Hamel 2002; Mäkinen 1998; Tight 1996).

In business and organisations, the concept of competencies can also be found to reshape the development of strategic management. Already Porter (1987) sees competence as an important source of competitive advantage. Still, especially the concept of core competencies (Hamel & Prahalad 1990; Hamel 2002) has become very popular as an approach to strategies and a source of competitive advantage. Core competence can be defined as something more than just the command of separate and individual skills or technologies, and it refers to a competence-based ability of an organization to combine and coordinate different production skills and technologies (Hamel & Prahalad 1990). Ruohotie (1996) sees core competencies as combinations of collective know-how, including complex social know-how, ability to communicate and transfer knowledge vertically and horizontally within an organization but also over organizational borders, ability to innovatively combine existing know-how, and ability to produce new know-how that is based on the processes and products of an organization. Core competence is also unique to an organization, and it is typically difficult to copy or imitate (Hamel & Prahalad 1990; Hamel 2002; Ruohotie 1996).

Another potential approach to qualifications and competencies could be to widen the discussion to the concept of learning organisations. There are a number of different definitions for a learning organisation, but a useful approach is to see it as an organization, where the members develop their own capacity, and the organization maintains and supports learning processes, where new knowledge and skills are continually created and combined to earlier know-how base (Ruohotie 1996, 40; c.f. Senge 1994). Hakkarainen, Helenius & Jääskeläinen (1999) have combined the idea of individual and mutual qualifications and competencies, and the need for organizational learning and development, and argue that vocational qualifications of an individual should be understood as elements that are connected to the activities, mutual skills and work processes of a larger community (Hakkarainen et al. 1999, 23). All these are important ideas also from the viewpoint of this study, but since the research on learning organisations (and organisational learning) is an extensive area of its own, a deeper discussion on these topics has been narrowed beyond the scope of this study.

The concepts that are quite closely related to qualifications and competencies also include know-how. Niiniluoto (1989) sees know-how as readiness to successfully do something and succeed in a certain task, and Räisänen (1998) defines vocational know-how as the ability to manage in work-related processes. Like qualifications and competencies, know-how is a highly situational concept that refers to the ability to apply knowledge and skills rationally and successfully in different situations (Raivola & Vuorensyrjä 1998).

Know-how has also been defined as a combination of theoretical, practical and experiential knowledge. Thereby, know-how cannot be fully achieved only by traditional educational approaches, but practical work experience is also needed (Järvinen, Koivisto & Poikela 2000).

Another concept, which can be considered relevant to discuss here is expertise. Experts can be defined as people who have developed their competencies to a high level (Sternberg 2005, 15). According to Eteläpelto (1997), crucial elements in expertise are the deepness of knowledge in a special area and the ability to process and combine information. In turn, Taalas (1995) sees characteristics of expertise as multiskillness, a creative ability to apply theories to practice, and a challenge-oriented mindset. Taalas (1995) also describes the development of expertise as a process that proceeds in stages and results in changes in motivation, perception, action, relationships etc. (c.f. Kivinen et al. 2003, 29-32). In turn, Tynjälä (1999; 2003) describes the development of expertise as a progressive learning process, where an individual, or similarly a team or a work community, does continuous self-reflection and redetermines one's tasks and actions. Related to a more collective approach, Launis & Engeström (1999) see expertise increasingly as the ability of organizations and networks to solve new and changing problems.

Overall, it can be said that there is a variety of literature on qualifications and related concepts, and the content and use of them is not unambiguous. Interesting viewpoints, also for the purposes of this study, include the contextual nature of qualifications, as well as a movement towards a wider and increasingly mutual and organisation-based approach to qualifications and related concepts. These ideas support the choices made in this study, and give valuable theoretical backup to the chosen approach of analysing qualifications, and especially qualification requirements, especially at the level of SMEs as entities, instead of only concentrating on individuals and their narrowly defined sets of qualifications.

3.2 Challenges of changing qualification requirements in electronic commerce

The concept of qualification requirements has been used to analyse the requirements of employees and the changing contents of professions and work (Pelttari 1997; Metsämuuronen 1999). Here, it is important to notice the difference between qualifications and qualification requirements (Toikka 1984, 14). The relationship between qualifications and qualification requirements can be defined so that qualifications are adopted in relation to certain prerequisites of the work process, i.e. qualification requirements (Toikka 1984, 11). Knowledge-based economy has been argued to lead to increasingly rapidly changing qualification requirements, which poses new challenges to

individuals and emphasises the need for continuous development (e.g. Aaltonen & Wilenius 2002; Kolehmainen 2004).

In literature, qualification requirements, like qualifications, have traditionally been approached mainly from the viewpoint of an individual. Required qualifications are largely derived from work, but personal characteristics are also seen important for an individual to meet all qualification requirements (e.g. Ruohotie 2003; Streumer 1993; Tynjälä 2003). Qualification requirements can also be said to be closely connected to other concepts, like professional competence or expertise needs, which consist of abilities and skills, but also of values and attitudes (e.g. Kankaanpää 1998). A traditional approach to qualification research and development has been to map out potential deficiencies in the qualifications of a person in relation to certain defined qualification requirements, to find out qualification gaps and learning needs, and to construct a development plan accordingly. Here, learning needs can thus be defined as the difference between the present level and the desired level of qualifications (Paukku 1978, 10).

Like the analysis of qualifications, also the analysis of qualification requirements can be extended from individuals to more collective levels, e.g. the level of enterprises as business entities. Here, qualification requirements can be determined as the demands that a success in changing environment sets for the knowledge and skill related capabilities of an enterprise (c.f. Kankaanpää 1998). The chosen approach to qualification requirements in this study follows this kind of collective approach, which can also be justified by the chosen research context, i.e. electronic commerce, which is closely linked to the development of the modern information society. E.g. Launis & Engeström (1999) have argued that if only individual level is overemphasized in the development of qualifications, it may lead to impossible requirements. It has also been argued that mutual learning helps the critical assessment of the activities of a work community, encourages new experiments, and thereby supports a work community to meet the changing qualification requirements. Still, a practical problem is that a work organizations' qualification requirements have also turned out to be difficult to define, and they are also often expressed at such a general level that makes it problematic to base specific development efforts on them (c.f. Rauhala 1993, 15).

Related to the discussion above, within the research of qualifications and qualification requirements, this study can be positioned as an effort to do research on qualification requirements in a new important context, i.e. electronic commerce, which has not been largely covered from these perspectives. There are certain articles and texts that approach the opportunities and challenges of e-commerce also from the viewpoint of both business and technology-related competencies and knowledge, and discuss and emphasise their role in potential business success (e.g. Da Silveira 2003; European Union 2002; Scupola 2008; Zhu, Dong, Xu & Kraemer 2006; Zhu, Kraemer & Xu 2003). Still, this study can be considered innovative, since it aims to construct a systematic setting to analyse the qualification requirements of SMEs in e-

commerce, which is a topic without similar earlier efforts. Also, with its focus on SMEs as entities, this study deliberately concentrates mostly on the qualification requirements at the level of enterprises instead of individuals, which has typically been the case in qualification research. Overall, it can be argued that this study is a potentially significant multidisciplinary effort aiming to combine elements of business and entrepreneurship research, educational research and futures research in an innovative way.

Changes in economic environment and society have been observed to reflect quickly in the demand for qualifications and competencies (e.g. Alasoini 1996; Engeström 1995; Metsämuuronen 1998; Ruohotie & Honka 2003). As illustrated earlier, the development of e- commerce is a significant change factor with potentially deep impacts on the future business practices, and thereby also on the qualification requirements and the nature of work in a number of different professions. Anticipation of the qualification requirements in electronic commerce can thus be seen as a tool to support the development efforts of both organizations and individuals struggling to meet the new requirements (c.f. Aaltonen & Wilenius 2002; Stenvall 2001). Anticipation can help to understand development needs and to formulate development objectives and measures, which has also motivated this study. The following chapters will illustrate and discuss the need for and the challenges of the anticipation of future qualification requirements in electronic commerce both from the viewpoint of SMEs and their business development, and from the viewpoint of educational and training systems.

3.2.1 Anticipation of qualification requirements and SME business development

The ability to anticipate the future, recognize opening opportunities and proactively respond to foreseeable changes is seen as an increasingly important success factor for businesses (c.f. Aaltonen & Wilenius 2002; Hamel 2002; Kaivo-oja & Kuusi 1999). According to Aaltonen & Wilenius (2002), a company or an enterprise that wants to anticipate its future qualification requirements should pay attention to the qualifications that the current business operations are based on, the markets where the company wants to operate in the future, and the qualification requirements in the future markets. Based on these considerations, a company or enterprise can then figure out how to develop the required qualifications (and competencies) to aim at success in the chosen markets.

Important connections can be found between anticipation and the future-oriented strategy work of enterprises. Anticipation of the future can thus be seen as a tool to respond to strategic challenges (e.g. Aaltonen & Wilenius 2002, 76; Mannermaa 1999a, 35, 59). To have success in rapidly changing environment, both enterprises and individuals should develop their future readiness, i.e. preparedness for the anticipated future development lines (c.f. Remes 1993, 155). Anticipation can be seen as a tool that promotes strategic learning, questioning and unlearning from old routines and business models,

which also connects anticipation to the ideas of organisational learning (e.g. Argyris & Schön 1996; Senge 1994).

Also for SMEs in electronic commerce, anticipation of qualification requirements can be seen as an important success factor. Systematic anticipation work can both help them to utilise opening opportunities and to control the risks caused by uncertain environment. As pointed out earlier, inadequacies in qualifications and competencies have been found to be a significant barrier for the development of e-commerce activities in SMEs. Thus, increasing attention should be paid to anticipatory development of human capital. Still, many SMEs do not seem to have planned training or development methods, and their understanding of electronic commerce has often been found to be superficial (Barry & Milner 2002; Lawson et al. 2003, 273).

It is also a challenge that the demands for e.g. technical skills are constantly changing, even though the most important e-commerce problems in SMEs have been found to be typically non-technical (e.g. European Union 2002). The problem of potential deficiencies in qualifications, know-how and skills is also intensified by the fact that qualification requirements change, and a growing part of qualifications seems to lose their meaning over time (c.f. Otala 1996; Rauhala 1993; Ruohotie 2002; Ruohotie & Honka 2003; Olesen 1989; Tynjälä 2003). Also, the highly contextual nature of qualifications (or competencies) sets problems for the analyses of qualification requirements, since these requirements may differ considerably also between different kinds of SMEs. Therefore, only general analyses of SMEs are not sufficient alone, but they should be complemented e.g. by detailed industry-specific analyses or even enterprise-specific analyses. However, these analyses are beyond the scope of this study, where the emphasis is on SMEs at a more general level.

For a successful anticipation of qualification requirements, the ability to define and prioritise development needs, as well as the skill to analyse the changes in the environment, are needed. Thus, it becomes increasingly important for enterprises to integrate internal and external information (c.f. Hamel 2002; Kanter 2001). This is a remarkable challenge, but at best innovative and strategically successful enterprises here can gain considerable rewards (c.f. Remes 1993, 153). Changes in the operational environment require development activities from SMEs, and unless they are able to meet this challenge, the future electronic commerce may seem rather as a threat than an opportunity for them. A problem is that due to limited resources, SMEs do not typically have specialised personnel for the development of new issues, like e-commerce activities, and they may also lack the experience and expertise of managing change processes successfully. On the other hand, as relatively small units in the economy, SMEs have often got used to adapting to the changes in customer demands and environment quicker than their larger rivals (c.f. Kuitunen, Ilomäki, Simons & Valjakka (toim.). 2003; Littunen 1998).

Also from the viewpoint of the development of qualifications, an important strategic question to SMEs in electronic commerce is cooperation and networking. Successful use of partnerships and strategic alliances could allow

enterprises to focus on their core competencies and enhance competitiveness by developing new kinds of resource clusters (e.g. Hamel 2002). In electronic commerce, e.g. the exploitation of relevant technological innovations can be a crucial success factor also for SMEs, and by cooperation they could try to share costs of potentially expensive solutions, and also to get solutions that are better designed and tailored for their special needs and purposes. By cooperation and networking the typically scarce electronic commerce qualifications, know-how and skills could be developed together by mutual anticipation, training and other activities, mutual hiring of expert services, specialised personnel etc.

Overall, the identification and anticipation of qualification requirements should be seen as an essentially important activity in SMEs in electronic commerce. In practice, however, a big challenge is to make anticipation as a concept more concrete in SMEs. Anticipation should also not be seen as ”a separate island”, but rather like an integrated part of normal future-oriented strategic development work (c.f. Mannermaa 1999a; Mannermaa (toim.) 2000; Ovaskainen & Ritsilä 2000; Stenvall 2001). At its best, this could also provide a relevant micro level “hands-on” approach to anticipation, which could partly solve the problem that anticipation as an activity has perhaps too often been based only on the work and information of external experts, and enterprises themselves have not always been sufficiently involved in the anticipation of their own future needs. In addition, the development of adequate tools and methods for the anticipation work at the micro level could also be promoted by the public sector, e.g. through special funds for this purpose (e.g. Mannermaa (toim.) 2000).

3.2.2 Qualification requirements and the pressures on educational and training systems

A central instrument to provide skills, knowledge and qualifications of the working life has traditionally been education, which provides individuals with both formal qualifications (degrees, diplomas) and informal qualifications related to working abilities, skills and attitudes (e.g. Eteläpelto 1997; Kivinen, Rinne & Ahola 1989; Taalas 1995). Qualifications and qualification requirements have been commonly used as key concepts in the discussion of the development needs of education and efforts to turn the demands of working life into learning objectives (see e.g. Berg 1986, 35-36; Ruohotie 2002; Ruohotie & Honka 2003). Therefore, also in the case of electronic commerce, it is important to observe qualifications and qualification requirements from the viewpoint of education and its challenges.

In the changing society, economy and working life, there are a number of development factors, which should be taken into account in the planning of future education and training. According to Väärälä (1995a), education is under significant development pressures that stem from three interconnected main phenomena:

- General changes in society and lifestyle
- Changes in labour markets
- Changes in work processes

All these phenomena cause significant challenges to education, as illustrated in Figure 5.

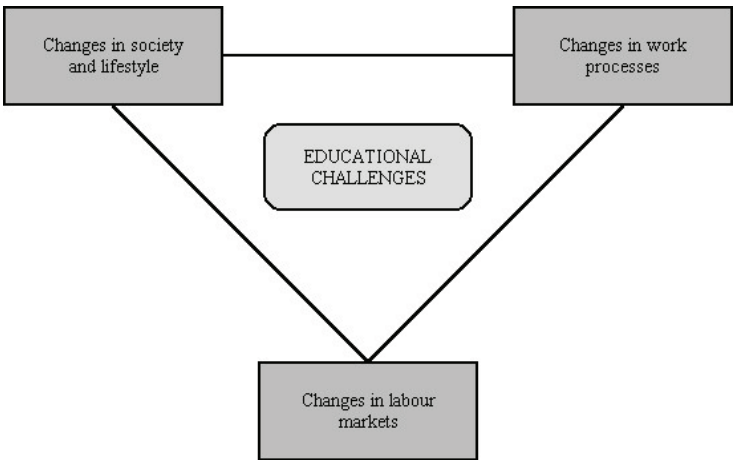

FIGURE 5 Education and its different development pressures (adapted from Väärälä 1995a, 133)

All the presented phenomena should also be taken into account when planning future-oriented educational and training systems. Connections can also be found between the presented phenomena and the development of electronic commerce, which can be seen as a part of technological and business progress that has an influence both on work processes, labour markets, professions and professional qualifications, as well as the society and lifestyle in general.

In Finland, formal and institution-based education has traditionally had a significant role in the learning of individuals, and thereby also enterprises. In international comparisons, Finnish learning results have also achieved a good success. Nevertheless, especially in the higher levels of education, the results of education should also be evaluated based on the ability of the professional qualifications provided by the education to meet the demands of the labour market (e.g. Honka, Ruohotie, Suvanto & Mustonen (toim.) 2000; Ritsilä 1998). In fact, enterprises have criticized that educational system operates too separately from the working life and is not able to respond to its needs in the best possible way (e.g. Ritsilä 1998; c.f. Kivinen et al. 2003, 12). These problems have been recognised and tried to be solved by certain educational reforms, supported also by development programmes (e.g. Ovaskainen & Ritsilä 2000; Stenström & Nikkanen 2005; Uusitalo 2001). Thus, as a result of a growing criticism of traditional institute-based education, e.g. the roles of on-the-job learning and action learning have increased especially in vocational education (e.g. Väärälä 1995b; Uusitalo 2001).

To meet the new challenges, education should react quickly to the changes in the environment, and it should be proactive and anticipatory in its development efforts (e.g. Ruohotie 2002; Ritsilä 1998; Tynjälä 2003). This would also support the achievement of a high return on educational investments, and helps to gain economically desirable results with the inputs in education (c.f. Blaug 1992).[2] Still, there have been growing worries about the inability of vocational education to efficiently provide the required qualifications, know-how and skills, which has partly also led to more active anticipation of future qualification requirements (e.g. Kivinen 1998; Väärälä 1995b; c.f. Metsämuuronen 1998). Nevertheless, practical anticipation work of qualification requirements is troubled by a number of problems, and the relevance and usability of anticipation information has been criticized (e.g. Remes 1993, 153). Typical problems in anticipation include the potentially surprising nature of the future and difficulty of concretely mapping out its potential development trends. An important practical problem has also turned out to be that the results of the research on qualification requirements are often difficult to interpret and turn into the practical development of education. Often, it has also turned out difficult to clearly derive from the research results what kinds of educational or pedagogical development measures would really be needed (Metsämuuronen 1998, 30-31).

In the information society, qualification requirements have been anticipated to continuously grow and new combinations of different qualifications are expected to be needed in the work life (e.g. Kaivo-oja & Kuusi 1999; Turtiainen 1997; Tynjälä 2003). The changing requirements of professionalism, i.e. an ability to combine different kinds of work-related skills and knowledge (e.g. Kankaanpää 1998) pose considerable challenges to education and training systems. As the need of the understanding of complex entities, social skills, entrepreneurial and marketing skills and "self-steering" seem to be increasing (in addition to narrowly focused skills and technological know-how), qualification requirements have to be assessed accordingly (Ruohotie 2002; Tynjälä 2003; c.f. Metsämuuronen 1998). Simultaneously, the challenges to educational and training systems seem to become increasingly complicated (c.f. Siikaniemi 2007).

Typical for electronic commerce has been rapid technological development, which has also led to partly rapidly changing qualification requirements. All in all, it has been argued that both degrees, qualifications, knowledge and skills may become outdated at an accelerating pace, which also causes challenges and problems to educational planning (c.f. Otala 1996). A very important question is how education and training systems can provide students with qualifications required in the work processes of the future, which do not necessarily even exist yet. Also in the case of electronic commerce,

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[2] Education also involves a number of other than economic aspects. Although economic aspects are emphasized e.g. in vocational education, education has an important role also, for example, in social development and cultural socialization (Väärälä 1995a, 40). Therefore, it can be argued that educational processes are under a problematic cross-pressure of different important objectives.

education cannot be only based on the needs of current work tasks. One of the core questions is then, how the development of professional know-how and skills could be best targeted to the topics that will be relevant also in the future (e.g. Sähkö- ja elektroniikkateollisuusliitto & Teknologian kehittämiskeskus 2000). Anyway, in dynamic areas of development, like electronic commerce, jobs and work tasks have been anticipated to change a quick pace, and there is a risk that the traditional development cycles of education will lag behind the development trends.

As a solution to the problems discussed above, it has been suggested that a considerable amount of cooperation would be needed from enterprises and educational institutions. To create successful interaction that can promote proactive behaviour, different parties should find common interests, common language and suitable practices to promote cooperation (e.g. Ritsilä 1998; Stockdale & Standing 2006). This kind of system could e.g. help enterprises to provide information about their future needs to educational institutions, and the gathered anticipation information could also be aggregated to help the public sector to plan potential interventions, development strategies, measures and support systems. In any case, action should be taken to respond to the generally observed needs of both SMEs and educational and training systems, if the qualification requirements of e-commerce were desired to meet.

4 RESEARCH DESIGN AND METHODOLOGY

This chapter aims to give a picture on the chosen scientific paradigm of this study, as well as the description of the chosen research setting and research strategy. The chapter starts from the discussion of the chosen scientific paradigm, and proceeds to the chosen methodology, i.e. qualitative research based on a multiple case study. Further, the chapter provides information on futures research as a research approach, and concentrates especially on the Delphi method, which was applied in this study. The chapter ends with a detailed description of the research setting and research strategy, and also includes information of the choices and practical implementation of the research process in its different stages.

In literature, most important phases of a research process have been presented to be the following, although they do not always follow one another in this particular order (Niiniluoto 1997, 25; c.f. Arbnor & Bjerke 1997, 256; Black 2002, 5-7):

1) Setting of a research problem
2) Focusing of the problem and formulation of a research strategy
3) Data collection
4) Data description
5) Data analysis
6) Making of conclusions
7) Reporting
8) Publishing of results

Although each research process is unique, the above presented phases can be typically found in any study. The aim of this chapter is also to provide a reader with information on how these phases have been carried out in the case of this particular study.

4.1 Scientific paradigm, methodology and research strategy

According to Gummesson (2000, 172), the choice of scientific paradigm in a research is affected by the following factors:

- Goals of the researcher
- Understanding of the researcher on the research topic
- Choice of research territory and the research projects within this territory
- Choice of methods and the roles of the researcher for gaining access to information
- Choice of quality criteria related to the assessment of research by the scientific community

In scientific research, ontology and epistemology deal with the nature of the research phenomenon, how and under what conditions information is available etc. Ontological beliefs determine what is believed of the research object (Kyrö 2004, 61), and deal with the nature of reality (Saunders, Lewis & Thornhill 2007, 108). An important question that determines the nature of the ontological foundation of a research is, whether empirical world is believed to exist objectively and independent of human beings, or subjectively and existent only as a consequence and creation of human actions. The objective view emphasises the factuality of knowledge and the technical nature of the whole information system. The subjective view, in turn, emphasises meanings, and the organisational and social nature of the system of knowledge/information. Also the idea of human being differs in objective and subjective views. According to the objective view, human action is determined by situation and environment, whereas the subjective view emphasises that human beings are autonomous and active actors with a free will. This study is based on the assumptions of the subjective view, and entities are assumed to be created from the perceptions and consequent actions of those social actors responsible for their creation. (Saunders, Lewis & Thornhill 2007, 612.) Moreover, through the process of social interaction these social phenomena are in a constant state of revision (Saunders, Lewis & Thornhill 2007, 108).

Epistemology refers to the nature of knowledge and scientific information. It deals with the questions of what kind of information, where and how is acquired, processed and produced of the research phenomenon (Kyrö 2004, 61). Epistemology concerns what constitutes acceptable knowledge in a field of study (Saunders, Lewis & Thornhill 2007, 102). An important division can be found between the positivist and antipositivist research philosophies or methodological approaches. In the positivist approach, a general attempt is to objectively explain and foresee, as well as to seek for causal relationships between the different factors that affect a phenomenon (c.f. Koskinen, Alasuutari & Peltonen 2005, 16; Saunders, Lewis & Thornhill 2007, 103). On the other hand, according to antipositivist view, social world can only be explained from the perspectives of individuals that participate in the phenomenon that is researched (Burrell & Morgan 1979; Järvinen & Järvinen 2000, 205). In this

study, the research approach is based on the antipositivist view, and consequently both the research phenomenon, i.e. qualification requirements, and the research context, i.e. electronic commerce, are seen as creations of the social world and subjective interaction between different groups.

In this study, scientific paradigm and research methodology are thus based on subjective interpretations of the research topics. This study and its underlying assumptions can be said to follow the assumptions of social constructionism, which emphasises the social construction of reality (Saunders, Lewis & Thornhill 2007, 108). In practice, this means that in this study the understanding of the chosen research topics is based on different interpretations of different social actors based on their own experiences and view of the world (Saunders, Lewis & Thornhill 2007, 108-109). Table 2 summarises the differences of the assumptions of social constructivism as opposed to positivism.

TABLE 2 Comparison of positivism and social constructivism (Koskinen, Alasuutari & Peltonen 2005, 34)

	POSITIVISM	**SOCIAL CONSTRUCTIVISM**
Role of the researcher	Independent of research object	Involved in the phenomenon
Human interests (economy, policy etc.)	Must not be important	Important part of the research
Research results	Show causal relationships between phenomena	Increase understanding of the research phenomenon
Progress in science based on	Hypotheses and deductive thinking	Content rich research material, which is typically analysed inductively
Research terms and concepts	Operationalised into a quantitative form	Include the viewpoints of research objects
Unit of analysis	Aims at specified and controllable units	Can also be a holistic situation, phenomenon or process
Generalisation	By scientific means	Based on theories and their interpretation
Sampling	A large number of cases, which are selected by randomized sampling techniques	Typically a small number of cases, chosen on the basis of their relevance for the research

On the basis of Table 2, it can be argued that this study follows the ideas of social constructivism in practically all the other topics, except the role of the researcher. Contradictory to the assumptions of social constructivism, the researcher was not strongly involved in the phenomenon during the research process, but rather has a more independent role in respect to the research object. Hereby, an aim was also to assure that the research questions were approached objectively. Also, especially for the purposes of the quantitative parts of this study, the concepts related to qualification requirements were operationalised in order to enable systematic and concretely focused analyses. This has required

the reduction of the abstract concepts of qualifications and qualification requirements to simplified elements that have been considered to constitute tangible indicators of them in the context of electronic commerce of SMEs (Saunders, Lewis & Thornhill 2007, 118, 605).

Methodology is related to scientific research process in the meaning of means by which scientific information is aimed at, formulated and justified (Kyrö 2004, 71). In terms of methodology, this study is qualitative by its main orientation. Qualitative research can be defined to refer to any type of research that produces findings not arrived at by statistical procedures or other means of quantification (Strauss & Corbin 1998, 10-11). Qualitative research is typically based on a relatively small number of cases, with which the researcher is often in interaction. Additionally, qualitative research typically analyses the cases from the viewpoint of the meanings that are given to the cases by the persons involved. Qualitative research is also often inductive by nature, and the hypotheses of the research are often developed during the research process as a result of the collection and analysis of research information (e.g. Hair, Money, Samouel & Page 2007, 288). Also, the aim is typically to minimise the active impact of the researcher on the research data, though e.g. interviewing situation almost inevitably differs from normal everyday conversations. In many types of qualitative research, the distance between produced research material and research object is also usually relatively small compared to statistical research, where observations are almost inevitably partly influenced by the chosen research questions, and measurement and interviewing techniques. (Koskinen, Alasuutari & Peltonen 2005, 31-32.)

In qualitative research, the research question is typically first relatively general by nature, and it is later formulated into a set of more detailed questions (Koskinen, Alasuutari & Peltonen 2005, 38). Thus, the research process often develops into its final form not earlier than during the research, also based on the observations from the research field (Grönfors 1982, 87, 145; c.f. Eskola & Suoranta 1998, 15-16). Koskinen, Alasuutari & Peltonen (2005, 39) give a following description of a qualitative research process:

- Interest in and motivation on the research phenomenon.
- Search for (a) more exact research problem(s).
- Search for relevant theoretical orientations explaining the research phenomenon and revealing appropriate aspects to the research problem.
- Construction of (a) more exact research problem(s) based on theories.
- Open-minded collection of data, partly forgetting theories and earlier observations.
- Analysis of the data, e.g. by classifying and categorising the findings and trying to find similarities and differences.
- Further classification and analyses of the observations by chosen criteria.
- Formulation of hypotheses, testing of these hypotheses by qualitative methods.

For its main part, this study can be seen as qualitative research, where the main aim is to increase the understanding of the qualification requirements of SMEs in electronic commerce. The reasoning for this is based on the nature of the research problem, since chosen mainly qualitative approach was seen

appropriate to obtain details that would be difficult or even impossible to extract through other methods (Strauss & Corbin 1998, 11). Still, this research is not only based on a certain qualitative method. In that sense, it follows the humanistic approach that sees people as active and thinking individuals, whose behaviour cannot be captured by any single model (Koskinen, Alasuutari & Peltonen 2005, 33).

The idea of combining quantitative and qualitative research approaches and analysing techniques in the same research has been discussed in literature, and it has been argued to provide a multifaceted picture of the research phenomenon and to have a number of advantages, despite the different background assumptions of the approaches (e.g. Koskinen, Alasuutari & Peltonen 2005, 46-47). A certain combination of qualitative and quantitative techniques is introduced in this study, which may also help to compare the research results and control potential mutual inconsistencies of them. This can also be seen as a factor, which for its part improves the validity and reliability of the results (e.g. Grönfors 1982). Thus, some concepts in this study have also been operationalised and quantified to provide interesting numerical background information, which is then followed by interpretative qualitative analyses (c.f. Strauss & Corbin 1998, 10-11). The aim is that quantitative results would give an idea of the importance of each qualification area in electronic commerce, and qualitative analyses complement this information by going deeper to the analyses of the detailed content and meaning of each qualification area.

Also, this study is based on a limited number of interviewees, who represent the viewpoints of electronic commerce experts and SMEs. From this viewpoint, it can also be seen as a kind of multiple case study. Especially the enterprises that were chosen as research units of the empirical part of this study can be considered as cases that could also be compared and categorised according to certain criteria. In literature, case studies have been argued to have a number of positive features, and they have been considered as a systematic, and also interactive, participatory, adaptive and value-based research method (e.g. Syrjälä & Numminen 1988, 8-11).

Yin (2003, 89-98) has presented three important principles for case-based research. First, research should always be based on more than one source of information, which enables different aspects. This also improves the construction validity of a research, since if the researches based on different information sources and methods lead to similar results, the construction can be considered more reliable than in the case of only one source or method. Second, a database of two collections of information should be constructed in case research – one collection including the notes, documents, graphs, stories etc. collected from the field, and the other collection including the reporting by the researcher, i.e. research reports, potential articles, books etc. The third important principle is trackability, so that an outside reviewer could follow and understand the logic of the researcher. This also improves the reliability of the research. All the three principles of Yin (2003) have been tried to be taken into account also in the planning, implementation and reporting of this study as far as possible.

Still, it must be pointed out that there are also several limitations in the chosen research setting, research strategy and implementation of this study. These limitations include a small sample of cases, i.e. enterprises, included in the analyses. However, this is typical to a research with qualitative parts, although it naturally weakens the generalisation potential of the results (c.f. Koskinen, Alasuutari & Peltonen 2005, 247-249). This has been understood, and it is a consequence of the deliberately chosen mainly qualitative research approach. Thus, when interpreting the result of this study, it should be kept in mind that the aim has not been to provide e.g. statistical information, which would have required more positivism-oriented research methods (e.g. Koskinen, Alasuutari & Peltonen 2005, 34).

4.2 Futures research and Delphi technique as research approaches

At the time of information collecting, the research topics of this study were highly future-oriented by nature. Also thereby this study is connected to a research orientation, which can be called futures research. This chapter first provides information about futures research as a research orientation, and then proceeds to more detailed information and also a critical assessment of the Delphi technique, which has been quite commonly used in futures research, and the principles and practices of which were also applied to the empirical implementation of this study.

Futures research as a research orientation

In futures research, the future is seen as a result of conscious thinking, planning, decision making and actions, as well as coincidences (e.g. Malaska 1993; Malaska & Mannermaa 1985; Mannermaa 1999a, Mannermaa 1999b). This study aims to provide information, which supports the positive future development and helps to plan and implement needed activities to meet the qualification requirements of SMEs in electronic commerce.

Niiniluoto (1998) defines the aim of futures research as to map out the different alternative futures, assess the desirability of them, and to find out ways to follow a desirable future path (c.f. Bell 1997). As the facts of the future are missing, futures research is also based on the present and the past. Hence, it can be said that futures research aims to widen the understanding of the present from multiple viewpoints, and thereby help to understand the likely developments in the future. An important objective in futures research is to develop the skills, behaviour and decision making of individuals to develop a better future. (Malaska 1993; Mannermaa 1999a). Typical to futures research is multidisciplinary approach and a wide scope, as well as an aim to achieve a deep understanding by combining different scientific approaches (e.g. Kamppinen, Malaska & Kuusi 2002, 25). Futures research has been said to be

value rational, since it is often based on the idea and aim of achieving certain desirable futures (Bell 1997; Malaska 1993; Mannermaa 1999b; Masini 1997).

Since there do not exist any direct facts about the future, futures research is challenging. Time perspective in the futures research is often even 10 to 20 years, but e.g. in the contexts like information technology the development phase has been considered to be so rapid that the time perspective is typically much shorter, e.g. 5 years (e.g. Mannermaa 1999a, 45). The most important feature of the future compared to the past is that the future is not predetermined, but open for new opportunities and new action (Aaltonen & Wilenius 2002, 9, 65). Consequently, Von Wright (1985) sees the information about the future as information about contingent states and events that sometimes will prevail and sometimes not.

Mannermaa (1999a, 25-26) divides futures research into three main paradigms: descriptive futures research, evolutionary futures research, and scenario paradigm. Of these, descriptive futures research is most suitable to the cases where the environment is relatively stable and the future trends can be described relatively easily. Evolutionary futures research, in turn, emphasises the finding of evolutionary development processes. Hence, the emphasis is on the search for the phases of steady development, potential breakpoints and the change tendencies linked to these processes (Mannermaa 1999a, 26; c.f. Malaska 1993). In turn, in the scenario paradigm, the main objective is not to predict the future, since it is considered impossible, but to find out different alternative future "manuscripts", called scenarios. Meristö (2003) defines a scenario as a future picture that is based on certain assumptions, and which tries to outline a profound and multi-dimensional picture of the future. Scenarios help to imagine what is possible and to analyse what is likely to happen, and they can also be value-based: positive, negative etc. (Malaska 1993; Mannermaa 1999a). The scenario paradigm emphasizes emancipatory information interest, which refers to an attempt to seek for alternative futures and to explicitly express the values behind these futures (Malaska & Mannermaa 1985; Söderlund & Kuusi 2002; Borg 2003). This approach is based on the assumption that people emancipate to act according to the desirable future (Söderlund & Kuusi 2002). Hereby, scenario-based futures research is also linked to active making of the future, and it may thus be affecting the decision making of people (Mannermaa 1993; Borg 2003). The scenarios form a basis for the choice of a desirable future (Meristö 2003). Based on the scenarios and the desired future vision, it is possible to make strategies and development plans to achieve the set vision (e.g. Mannermaa 1999a).

To support the aims of futures research, an important tool is anticipation. It can be defined as proactive activity, where the future is intentionally tried to analyse and mold to a desirable direction as far as possible (Aaltonen & Wilenius 2002, 69-70). The development of anticipation methods has been of high interest in futures research, and anticipation as an activity can be approached from various viewpoints (e.g. Hjelt, Luoma, van de Linde, Ligtvoet, Vader & Kahan 2001). Rubin (1995) has presented three main approaches to anticipation work. The first is based on an assumption that events result from

facts that are like laws of the nature, and therefore the future can be anticipated for certain. The second approach emphasizes active actions, individual events, cultures, attitudes etc. and their impacts on the future. According to this approach, anticipation is mainly related to the interpretation of these impacts. The third approach, in turn, is critical by nature, and sees that as a result of an increasingly complex and abstract environment, and the post-modern idea of knowledge, the future is becoming more and more complicated. This approach is therefore critical towards anticipation and its potential results, though on the other hand the complexity of the future can also be argued to only emphasise the need for systematic anticipation to gain at least some understanding of potential developments.

This study aims to apply the main principles of the futures research to analyse the development of the chosen phenomenon, i.e. qualification requirements, in the chosen context of electronic commerce of SMEs. Economic development trends, changes in labour markets, as well as the development of vocational qualification requirements in different contexts have been covered quite extensively in future-oriented research and anticipation projects also in Finland (e.g. Ritsilä 1998; Kaivo-oja & Kuusi 1999; Stenvall 2001). Nevertheless, despite its growing importance, electronic commerce has not been among these contexts, and its development trends, qualification requirements etc. have not been widely analysed in futures research. Though there has been a growing number of research on e-commerce, it has mostly had a different focus and concentrated on other aspects than the ones covered in this study, or futures research in general. In Finland, there has been an important research project that concentrated on the development of e-business models and concepts (see Järvelä &Tinnilä (toim.) 2000). This project provided important information and development ideas also for SMEs, but its approach and focus was still quite different from this study. Hence, it can be expected that this study can provide a contribution to both scientific and practical information, which there is a demand for.

This study also follows quite a typical feature of futures research by being multidisciplinary and aiming to combine different scientific approaches to provide an understanding of the future (e.g. Kamppinen, Malaska & Kuusi 2002, 25). The study combines elements of business economics and educational sciences, and also deals with a context, i.e. electronic commerce, which is strongly linked to information technology. On one hand, the research is related to the scenario paradigm of futures research, since it tried to map out the likely developments and evolving qualification requirements from the present to the future (at the time of the data collection). Still, the making of development scenarios was not the main point or focus of this research.

Bell (1997, 173-179) has presented a classification of six approaches to futures research, and this study is based on the first two of these, namely i) the research of the present ideas and the expectations of the possible futures, and ii) the ideas about the most likely future. Following its objectives, the study aims to explore future developments in the challenging area of the qualification requirements of SMEs in electronic commerce. Additionally, the aim is to

provide information to both SMEs and also to educational and training institutions, as well as the public sector in general, to develop strategies, systems and practices to support the development of desirable futures (c.f. Bell 1997; Mannermaa (toim.) 2000; Niiniluoto 1998).

Delphi as a research technique

Delphi (or the Delphi technique) is an expert-based method that originates in the U.S.A. at the Rand-corporation, where the use of the technique was started in the 1950s for the purposes of secret military technology research (Kuusi 2002, 205). The Delphi technique can be seen as a collection method of expert views, by which the potential future developments are assessed. The method can be classified under the futures research, which is logical as it is based on the collection of expert opinions and articulations about the potential future development paths (c.f. Mannermaa 1999a; Kamppinen, Malaska & Kuusi 2002). Delphi is also a method that has been argued to fit well to questions of multidisciplinary nature, and it has been seen as a flexible method which is relatively simple to learn and use, but produces valid results when implemented in a rigorous manner (c.f. Hatcher & Colton 2007)

As a result of criticism, the Delphi technique was practically abandoned for a while, before it was found again in the late 1980s (Kuusi 2002, 209-210). Since then, the technique has been quite widely used in the research based on the collection of expert information and its analysis (Kuusi 1993; Kuusi, Hiltunen & Linturi 2000; Kuusi 2002). Both qualitative and quantitative approaches and their combinations have been used in Delphi based research. All in all, the technique has been seen as flexible and adaptable to many different purposes, partly thanks to its wide philosophical basis. In practice, the technique has been used for a number of research purposes, including simply collecting information from experts, figuring out the state of unanimity, supporting decision making or providing basis for development work and anticipating the future (Hasson, Keeney & McKenna 2000; Ziglio 1996). Also, Delphi can be seen as a conventional method used in HRD, training and development, and related disciplines (Hatcher & Colton 2007, 571-572).

In Finland, the Delphi technique has been lately used e.g. in the research of the development needs of education, professional development and the anticipation of the future trends of different phenomena (Kuusi 2002). In educational research, Delphi has been utilized in the research that supports the development of curricula, aims to map out the development needs of educational personnel or the development needs of curricula, qualifications, expertise etc. At its best, the technique has been able to create both academically and practically very interesting and usable results.

Delphi as a method is largely dependent on experts and their opinions. Linstone & Turoff (Eds.) (1975) emphasise the particular expert communication process of the Delphi technique as a source of potential solutions to challenging questions or problems. This helps to structure the communication process of a group of individuals, classified as experts, so that the group as a whole can

work as "oracles" and analyse complex future questions and communicate their argumentations (Kuusi 2002, 204-205; Mannermaa 1999a, 150; Linstone & Turoff (Eds.) 1975, 3). Delphi panellists are typically not selected for demographic representativeness, but for the perceived subject matter expertise that they can contribute to the topic. There are also varying views on the appropriate size of the Delphi panel, and suggested sizes range from a few to 50 or more participants. (Hatcher & Colton 2007, 573.)

Based on the ideas of Woudenberg (1991), Kuusi (2002) presents three central features of the Delphi method. They are i) anonymity, ii) iteration, i.e. a number of rounds, and iii) feedback. In a Delphi research, a certain group or panel of experts is gathered to form their ideas of the research questions typically either by the help of questionnaires of interviews. The experts also get feedback of each other's opinions in the form of summaries that present the ideas and research results of the group as a whole. Then, the experts also have a chance to further develop their ideas based on the results of the previous round(s) of the Delphi process. During the process, the pertinent factors and assumptions behind the experts' opinions are also clarified to support realistic anticipation of the uncertain future (Linstone & Turoff (Eds.) 1975; Kaivo-oja & Kuusi 1997; Kuusi 2002). In the related literature, traditional Delphi procedures have been typically described to consist of three or more rounds, each of which consists of answering questions and also a vote (Hatcher & Colton 2007, 574). The carefully designed, structured and managed interaction of the Delphi has then be argued to be able to produce a result that constitutes a "reality construct for the group", and for its part also increase the validity of the results (Hatcher & Colton 2007, 575).

Linstone & Turoff (Eds.) (1975) divide the Delphi technique to two main forms: the conventional Delphi and the real-time Delphi, which typically uses information and communication technologies (Kuusi 2002). Further classifications and applications of the Delphi technique have also been developed, based on the chosen research objective (see e.g. Kaivo-oja & Kuusi 1997; Kuusi 1992; Woudenberg 1991). An interesting application is the argumentation-based Delphi technique, which helps to evaluate different kinds of potential future developments, and also to present argumentations for and against different megatrends, scenarios etc. (Kuusi 2002, 212).

From the scientific viewpoint, the Delphi can be seen as an approach to research rather than one strictly defined and independent research method (e.g. Mead & Moseley 2001). The theoretical basis of the Delphi technique is multifaceted, has been developing over time, and it includes a number of different approaches. The approaches can be divided to be based on either the Lockean, Leibzinian, Kantian, Hegelian or Singerian philosophy (Mitroff & Turoff 1975). In practice, the research phenomenon, the chosen research philosophy and the practical implementation of the research determine the size of the expert group and the scope of expertise covered. This study follows the Kantian philosophy, which suggests that the expert group should include persons, who have many different viewpoints to the research topic. Kantian

approach thus suggests that the best way to anticipate the future is to map out several alternative futures. (Mitroff & Turoff 1975.) Overall, also as a result of criticism by Millet & Honton (1991), the use of the Delphi technique has increasingly moved towards the direction, where the traditional Lockean idea of the unanimity of experts is not any more seen as desirable, but rather as a weakness (Kuusi 2002, 210). This can be seen reasonable, since the members of an expert group often represents different interest groups, and the "mean value" or consensus of the expert opinions does not often represent the best idea of the future. Consequently, the aim of a Delphi-based research has increasingly shifted from reaching a consensus to providing different aspects of the future of the research topics.

The multidisciplinary and future-oriented nature of the research problems, desire to use expert opinions, and above described positive features of the Delphi technique, including flexibility and adaptability, were behind the choice of an application of this technique as the approach for the implementation of this study. The chosen application of the Delphi technique was developed and used with an aim to bring together a number of different viewpoints on the research questions of this study. According to the Kantian approach, a heterogeneous group of experts, including representatives of SMEs, was chosen to represent various interest groups and aspects on the research questions in order to map out different aspects of the future. (c.f. Mitroff & Turoff 1975). The chosen approach to the Delphi technique, as well as the implementation of the research process, is illustrated in more detail in the following chapter, which concentrates on the description of the research setting and research strategy as they have been defined in this study.

4.3 Description of the chosen research setting and research strategy

According to a definition, research setting can be defined to include the description of the most important research questions, arguments and the units of analysis. Research setting also describes the logic and methods that have been used in the research, and explains the principles that have been used in the interpretation of results. (Koskinen, Alasuutari & Peltonen 2005, 160.) Research setting can also be defined to include the choices of the number of research cases and their relation and connection with one another (Koskinen, Alasuutari & Peltonen 2005, 31-32).

In turn, research strategy has been defined to refer to the entity of methodological and other solutions of a research (c.f. Hirsjärvi, Remes & Sajavaara 2008, 128). Niiniluoto (1997, 27) defines the concept of a research strategy to be two-dimensional:

1. It includes a detailed plan of the research process in its different phases: gathering of data, conceptual choices, measurement methods, analysing methods of research data and the potential experiments conducted.

2. It also deals with the practical questions of conducting the research - use of time, resources, research instruments, research group, organization, research budget.

When a research is planned, a crucial question is the choice of research techniques and methods that would suit to the chosen research problems. These issues have been paid attention also in the planning and implementation of this study. During a research process, important decisions have been made on a number of choices, including data gathering methods, data processing and analysis etc. This chapter attempts to describe the chosen research setting and strategy, and to clarify the reasoning behind decisions made in the course of study.

Research questions and limitations

The first and important part of a research setting is the definition of the research questions or objectives. On the other hand, when decisions are made on the questions or objectives to include, a number of them is simultaneously excluded, which emphasises the importance also to report the limitations of a study. Table 3 sums up these issues as they have been defined in this study.

TABLE 3 Basic elements of the chosen research setting

Research phenomenon	Qualification requirements
Context	SMEs in electronic commerce
Main research objectives	To provide new scientific information and to increase both theoretical and practical understanding of the qualification requirements of SMEs in successful electronic commerce.
	To provide information to SMEs and their owners to support the development of required mutual and individual qualifications.
	To provide information and development ideas to educational and training institutions & other relevant parties to develop systems and activities to meet the qualification requirements.
Limitations	Study is limited to SMEs, and geographically limited to Finland.
	Study is limited to a small sample, which has to be taken into account when assessing the result and their generalisation possibilities.
	Study concentrates on a number of chosen and predetermined areas of qualifications seen especially important for SMEs in electronic commerce.
	Study is not industry-specific, and more detailed information should be provided in further studies to tackle detailed industry-specific questions.
	Study concentrates mainly on qualitative analyses of different qualifications and qualification requirements, and does not aim to provide statistical information.

As illustrated in Table 3, the objectives of this study serve both scientific and practical interests. As pointed out earlier, the main objective is to provide valid research information on the qualification requirements of SMEs in electronic

commerce. Linked to this, an important aim is to support the development of required qualifications both by SMEs themselves, and by educational and training systems. Hereby, an aim is to support the supply and development of qualified personnel in an anticipatory way (c.f. Eteläpelto & Tynjälä (toim.) 1999; Mäkinen& Olkinuora 1999).

Still, as listed in Table 3, this study also has a number of limitations. First, it concentrates on SMEs, which (as described earlier) typically have certain special characteristics that distinguish them from larger enterprises. Second, the scope of this study is geographically limited to Finland, and e.g. international comparisons on qualification requirements etc. are left as a potential subject of further research. Third, this study concentrates on the qualification requirements of electronic commerce at a relatively general level, and it does not aim to cover detailed industry-specific questions. Fourth, this study is mainly qualitative by nature, and it is not intended to provide detailed statistical information on the different qualification requirements, their importance etc. Thus, this is also one of the subjects that have been left for more quantitatively oriented further research.

Choice of the participants of Delphi groups

The choices of main research methods and approaches of this study were made already before the start of the actual research process and the collection of empirical data. Still, as is typical for qualitatively oriented research, the final implementation of the methods was further detailed and refined during the research process (Eskola & Suoranta 1998, 15-16; Grönfors 1982, 87; Koskinen, Alasuutari & Peltonen 2005, 38). Still, the choice of the methods and approaches also had reflections on the choice of the research sample, i.e. the participants of the Delphi groups.

Related to the scope of the study, the choice of the sample was a very important choice (c.f. Kuusi 2002, 216-218). The decision was made to include multiple enterprises as cases, and according to the classification of Yin (2003, 41), this study could in this respect be called a multiple case study of holistic units (SMEs). This study includes typical characteristics of case studies, since it concentrates on intensive and detailed information of a relatively small number of cases, namely the experts of electronic commerce and the representatives of the enterprises that were chosen to the sample (Hirsjärvi, Remes & Sajavaara 2008, 130-131).

As mentioned earlier, an application of the Delphi technique was considered as a relevant research approach in this study, since this technique has been successfully used in the research of multidisciplinary and future-oriented phenomena (e.g. Mannermaa 1999a; Ziglio 1996). Accordingly, an important decision was the choice of the content and size of the Delphi group. In literature, there are not exact requirements for the size of this group, and it has been dependent on the situation and research interests (c.f. Kuusi 2002, 217-218). Since this study concentrates on a multifaceted phenomenon, a group representing a number of complementary approaches to e-commerce was

considered necessary. Thus, finally two different groups were included in the Delphi: one consisting of high-class professionals and academics (external experts), and one consisting of SME representatives (that could also be called internal experts). From the viewpoint of the aims of this study, the inclusion of the representatives of SMEs was considered necessary, although they did not necessarily have a high level of formal education or theoretical expertise either on qualification requirements or electronic commerce. Still, they were considered as the key persons responsible for the "grass root level" development of the e-commerce solutions in their enterprises, and thereby considered as practical "internal experts". The inclusion of them as members of an expert-based data gathering technique can hence be justified, especially since even uninitiated members with only a common sense knowledge on the research topic have sometimes been used as Delphi group members (e.g. Hyttinen 1999; Kaivo-oja & Kuusi 1997; Kennedy 2004).

Since there did not exist any extensive databases either of e-commerce experts or SMEs in e-commerce, the final choice or sampling of the Delphi members had to be based on other than traditional statistical methods. Instead of a random sample, the construction of the Delphi groups was thus based on purposive sampling (Black 2002, 54), which is quite a typical and accepted technique to choose research objects especially in qualitative research (e.g. Alasuutari 1999). The choice of the Delphi group members was based on collective thinking of the researcher and a small team of supportive experts, including research professionals. The criteria for the choice of relevant and interesting members were set beforehand, and the most important criterion was a proven understanding of and/or involvement in e-commerce and its development. It was also considered important that the chosen persons were truly motivated of and interested in the study (c.f. Kaivo-oja & Kuusi 1997).

Overall, the Delphi group was hence collected by a nonstatistical sampling technique, which had characteristics of purposive or judgment sampling, where the researcher selects the sample based on certain judgment of expertise (c.f. Black 2002, 54; Hair et al. 2007, 181-182). Also, the used method had characteristics of snowball sampling, which is a special nonprobability method that is typically used when the desired sample characteristic is rare (e.g. Kuusi 2002, 218). Typical to snowball sampling is that it relies on referrals from initial subjects to generate additional subjects, which lowers search costs. On the other hand, a problem is that this kind of sampling technique usually introduces bias, because it almost inevitably results in a sample that does not represent a good cross section of the population. (c.f. Black 2002; Kuusi 2002; Mead & Moseley 2001). Still, although the sample was based on nonprobability sampling, it can be considered representative in the sense that it represents the researcher's judgment of what is wanted (Hair et al. 2007, 182).

By using the above described nonstatistical method, the members of the Delphi were chosen based on a division to two groups: experts of electronic commerce (15) and representatives of SMEs in electronic commerce (10). Since the numbers of the members of both groups were decided beforehand, the used

sampling technique also had characteristics of quota sampling (Black 2002, 55; Hair et al. 2007, 182). As a result of the process of careful selection, the chosen group of experts (15) consisted of persons, who were considered to have a knowingly deep understanding of electronic commerce from different perspectives – including both academics, relevant authorities and representatives of well-respected e-commerce solution/service providers. An important decision was also to have a geographically diverse sample groups from different parts of Finland. Table 4 sums up the background information of the persons, who were selected as the 15 experts of electronic commerce in the Delphi group.

From Table 4 it can be seen that the members of the expert group represent different kinds of organisations, and provided the researcher with many interesting viewpoints on the research questions. In terms of gender, the chosen experts of this Delphi group were not equally distributed, since thirteen (13) of them were male and only two (2) were female persons. The age structure of the group was such that there was quite an equal distribution between persons with a longer business and/or technology perspective and younger persons who had been recruited more directly as specialised electronic commerce experts. Mutual to all the group members was a recognised expertise and experience in electronic commerce and its development, i.e. the context of this research. A proven understanding of the context was also seen as an important prerequisite for an ability to understand the qualification requirements of e-commerce, i.e. the research phenomenon of this study.

TABLE 4 Background information of the interviewed electronic commerce experts

Type of organisation	**Position in the organisation**
1. University	Professor with expertise in electronic commerce
2. University of Applied Sciences	Expert of e-commerce, especially logistics
3. National funding agency for technology and innovation	Leading electronic commerce expert
4. Regional development organisation in information technology sector	Information technology expert
5. Labour union in commercial sector	Expert analyst of e-commerce related questions
6. Large Finnish retail group	Leading electronic commerce expert
7. R&D unit of a large technology company	Electronic business expert and analyst
8. Internet solutions development unit of an international bank	Expert in charge of electronic business solutions
9. E-commerce development unit of a publishing company	Electronic commerce expert, editor-in-chief
10. Unit specialised on the Internet solutions of a group of companies	Manager, leading electronic business expert
11. International service company specialised on Internet solutions	Electronic business expert, head of the department
12. International service company specialised on Internet solutions	Electronic business expert, leading consultant
13. Service company specialised on Internet solutions	Electronic business expert, consultant
14. Service company specialised on the development of Internet-solutions	Electronic business expert, consultant
15. Service company specialised in e-business development	Business expert, managing director

The choice of the ten enterprises to participate in the Delphi group was in many respects even more difficult than the choice of experts. The enterprises were considered as highly important case study units that all have their own specific characteristics related to the planned and implemented development of e-commerce activities. Finally, the decision was made to use a similar sampling technique as in the case of the experts, and the idea was to collect a heterogeneous, interesting sample of enterprises from a variety of industries or business sectors. It was also deliberately decided to have enterprises from a geographically diverse area in this Delphi group. Also, an aim was to collect a diverse group of enterprises in terms of e-commerce strategies, size and available resources, although all enterprises were to be categorised as SMEs. All the chosen enterprises were positive towards electronic commerce and this study. The chosen representatives of these enterprises had experience in e-commerce and a mature insight on e-commerce evolution in their enterprise's case. Also they were considered to be the persons able to best analyse the qualification requirements within their enterprises. The gender distribution of the representatives was equal, and five (5) of them were male and five (5) were female persons. In terms of age, the chosen representatives were not very young, but they had work experience and were also in relatively high positions in their organisations. Table 5 provides background information on the chosen enterprises and their representatives.

TABLE 5 Background information of the interviewed representatives of enterprises

Industry / Business sector	**Size and location**	**Position of the interviewed person**
1. Internet sales of groceries	Small enterprise, capital area	Entrepreneur / director
2. Sales of music & related products	Small enterprise, a regional centre	Entrepreneur / director
3. Development and sales of computer programs	Small enterprise, a rural area	Entrepreneur / director
4. Sales of special furniture	Small enterprise, outskirts of a regional centre	Entrepreneur / director
5. Sales of plants & gardening products, restaurant	Small / middle-sized enterprise, a regional centre	Entrepreneur / director
6. Sales of flowers by Internet	Small enterprise, a central area in southern Finland	Shop manager
7. Sports and activity centre	Small enterprise, outskirts of a regional centre	Entrepreneur
8. Travel agency	Small enterprise, a regional centre	Internet specialist & developer of e-commerce systems
9. Sales of cars	Middle-sized enterprise, a regional centre	Managing director
10. Sales of books	Middle-sized unit (a part of a large entity), capital area	Internet specialist, developer of e-commerce systems

As Table 5 shows, the enterprises in the Delphi group represent a variety of different industries and/or product & service categories, which was the aim. A

majority of the enterprises concentrated mainly on business-to-consumer markets, but the representatives of two enterprises (sales of computer programs and special furniture) expressed their target to be on business-to-business markets. Only a minority of chosen enterprises concentrated solely on e-commerce, and for most its role was considered as complementary to more traditional sales channels. The products of the enterprises were mainly physical products, which were not delivered in digital form, and required physical transportation and logistics systems. According to one of the aims of choosing the sample, all the enterprises can be classified as SMEs, except one, which was small as a unit, but actually a part of a larger book sales chain. Therefore it does not meet all the criteria set for an SME in the European definition (European Commission 2008), but still it was decided to include in the sample, since book sales was considered as such an interesting business sector from the viewpoint of e-commerce. Anyway, despite this one exception, the chosen sample was seen to represent a great variety of SMEs, whose role is crucial in the economic development and employment of Finland (e.g. Littunen 1998; Otala 1996). Further, many of the chosen enterprises could also be classified as micro enterprises with less than ten employees (c.f. European Union 2002; Suomen Yrittäjät 2009).

An important principle was also that the used application of the Delphi method was based on democratic treatment and equality of the members of the groups, and all the views were considered equal by weight (c.f. Mannermaa 1999a). For a number of reasons, the use of anonymity was also chosen as a part of the conducted Delphi process. In literature, anonymity has been supported by the reasons related e.g. to the different academic and professional standings of the participants, elimination of the fear of losing one's face, and elimination of potential biases and power differences (Hatcher & Colton 2007, 575; Kennedy 2004, 505; Kuusi 2002, 206, 219). The group was also the same in both two rounds of the chosen application of the Delphi technique, which can be seen crucial for the deepening and widening of research information during the process. A very important choice, related to reporting, was also to report the results of the experts and the representatives of SMEs separately, which also enabled potentially interesting comparisons between these groups.

Data gathering

A very important choice in a research is the decision on data gathering, which should fit to the chosen research setting. Typically, the scientific contribution of qualitative research is based on the provision of new information that helps to understand the chosen research phenomenon (e.g. Koskinen, Alasuutari & Peltonen 2005; Strauss & Corbin 1998). To enable this, data gathering should be carefully planned and implemented.

In this study, the choice of the data gathering method was directed both by the chosen research approach, data needs, but also available resources. After a careful evaluation of the advantages and disadvantages of potential methods, the decision was made to collect the data by a semi-structured interviewing

method (e.g. Hair et al. 2007, 197; c.f. Kuusi 2002, 206). In literature, interviewing has been seen as a good, and especially in qualitative research sometimes even the only way to gather information on the meanings and interpretations that people have about phenomena (Koskinen, Alasuutari & Peltonen 2005, 106). With regard to the objectives, nature and the chosen research orientation of this study, it was thus seen natural that the information gathering from the members of the Delphi groups would be based on careful interviewing. Generally, in Delphi-based research, it has become common to use interviewing, which also helps to avoid a typical problem of questionnaire-based researches, namely a low answering rate (Kuusi 2002, 206). Interviewing is also considered positive for the quality of the data, since the interviewing process provides opportunities to check that the respondents seriously concentrate on their answers.

The construction of the interviews was based on the choice to apply the principles of the Delphi technique in this study. The data collecting process could be described to have followed an idea of a "double cross-section", which is a kind of a "dublicated" version of a normal cross-section data collecting technique, which is quite typical in qualitatively oriented research (c.f. Koskinen, Alasuutari & Peltonen 2005, 44). The data was collected by thematic interviews in two rounds, first one round and later an iteration round, following the principles of the Delphi technique. As in many recent Delphi-based researches, the number of iteration rounds was restricted to one (c.f. Kuusi 2002, 207). Between the two rounds, the interviewed persons were sent a report, which included the results of the first round, and they could also comment the results and present additional ideas on the research topics. After this, the second round of interviews was implemented, and additional information collected both by deepening the themes of the first round and also widening the topics to cover new important themes, also based on the findings of the first round. As this kind of two-rounded Delphi technique enabled a further focusing of the research questions between the rounds, it can be argued that the validity of the results could also be improved by this procedure (c.f. Grönfors 1982).

For the successful implementation of the data gathering process, it was essential to get access to the chosen members of the Delphi groups, and motivate them to participate in the research. It was relatively easy to get the first contact with the members. Still, the fact that they were busy people in high positions had implications both on the contacts with the persons, the actual interviewing process, and the overall interaction in the different phases of the research process. The chosen persons were contacted beforehand by telephone, given information on this study, and asked to join as members of the Delphi group (c.f. Kuusi 2002, 206). Here, an aim was also to motivate them and also get them committed to participate in both of the two rounds of thematic interviews (c.f. Hasson et al. 2000; Mannermaa 1999a; Mead & Moseley 2001). It has been found that the expected benefits from the results are an important factor motivating experts to participate in a Delphi (Hatcher & Colton 2007,

573). Fortunately, all the planned Delphi members were convinced of the importance and relevance of this study, and therefore were eager to participate. A part of the members knew the researcher and/or his background research institution beforehand, which also had a positive effect on their motivation to participate. Only one expert that was asked as a group member could not participate in the research himself, but also he asked another expert from the same organization as a participant. There were also no cancellations later, and despite a few minor delays, the interviews could be conducted on the agreed dates in agreed places during the both of the two Delphi rounds. (c.f. Koskinen, Alasuutari & Peltonen 2005, 112-115).

An important part of a Delphi procedure is the development of a questionnaire. As validity is of primary importance in scientific research, it is important to pay attention to careful questionnaire construction (c.f. Hatcher & Colton 2007, 577). Also in this thesis, the questionnaire was a central instrument guiding interviews, and it gave them a form, helped to guarantee that all necessary questions were asked, and supported a logical flow of conversation. In general, the form, number, type and order of questions are all important issues to consider when making an interview questionnaire (Koskinen, Alasuutari & Peltonen 2005, 108-110). Also in this study, the question structure was designed carefully, and it was also reviewed by a small number of experts, including colleagues of the researcher and a professor of electronic commerce (c.f. Hasson et al. 2000; Kuusi 1993; Linstone & Turoff (Eds.) 1975; Mannermaa 1999a). A lot of work was done to find the appropriate question themes and structures to serve the objectives and information needs of this study (c.f. Kuusi 1993; Kuusi 2002, 220-221). The aim was to build a relatively small number of relevant questions to gain accurate information in a limited time that was realistically available for each interview (about an hour or two).

To enable systematic and detailed analyses, the conducted interviews concentrated on certain, pre-decided theme areas. In the first round of the interviews, the aim was first to concentrate on the "big picture" of the development of electronic commerce and to map out important development trends. The questionnaire was thus constructed to start with a small number of questions, which led the interviewees to the research topics by a discussion of general development paths of e-commerce. This also followed the idea of the classical Delphi technique to open with general questions that provide an opportunity to illustrate the respondent's viewpoints (Hasson et al. 2000; Whitman 1990). Then, the questions proceeded to the main research phenomenon, i.e. the analysis of qualification requirements of SMEs in electronic commerce. A special construction of questions was developed for this purpose, and it was introduced to the members of the Delphi group, who found it appropriate and relevant for the purposes of the study. The questions were also tested before the first Delphi interviews, and since they seemed to work, no further changes were made.

Overall, the design of relevant question types was a question of primary concern when planning the data gathering. In accordance to the chosen research

approach, the final question structure combined interpretative qualitative analyses and simple quantitative analyses concentrating on a number of chosen thematic areas of qualification requirements. The interview questionnaires were semi-structured, and the basic themes of the questions were determined beforehand by the researcher. Still, the interviewees were also given freedom to discuss their answers, and in the first round of interviews even suggest the relevant research topics or questions for the second round (c.f. Koskinen, Alasuutari & Peltonen 2005, 128-129). This kind of semi-structured interviewing approach has been commonly used especially in qualitative research, and it has provided good experiences as an efficient method to gather information. The method allows the researcher to guide the interviewing situation without controlling it completely (Hair et al. 2007, 197-200). A well-constructed and conducted semi-structured interview can also be a motivating experience, which raises the involvement level of the interviewees (Koskinen, Alasuutari & Peltonen 2005, 105). According to the idea of the Delphi technique, the interviews of this study were also constructed so that the results of the first round could be further deepened and focused on the second round (e.g. Kuusi 1993). Based on the results of the first round, the second round proceeded further into the thematic qualification requirements and their more detailed qualitative content.

The main themes of the questions on the first round of the Delphi-based interviewing process for both Delphi groups (experts and representatives of the enterprises) were the following:

- Future (mega)trends of electronic commerce, especially from the SME viewpoint
- SWOT analysis of electronic commerce, especially from the viewpoint of SMEs
- E-commerce and the development of professions & qualification requirements of individuals
- Thematically analysed future qualification requirements of SMEs (as entities) in electronic commerce
- Assessment and development needs of different kinds of education and training systems
- Development ideas for the anticipation of the future qualification requirements of SMEs in electronic commerce

According to the chosen Delphi-based research approach, the first round results were also considered when constructing the second round of interviews. The themes of the first interviews were both deepened and partly widened, and important new questions were also raised. New areas of emphasis in the second round were related to strategies and differences in qualification requirements between SMEs and larger companies. Also, the differences between e-commerce start-ups and more traditional, so called bricks-and-mortal enterprises were included as an interesting theme of analysis. The main aim of the second round, however, was especially to further deepen the qualitative analyses of specific qualification requirements under chosen areas and their subareas.

To focus on most appropriate questions and viewpoints, the decision was also made to differentiate the questions of the two Delphi groups (experts and

the representatives of enterprises) from one another on the second round. Consequently, the main themes of the second round of *expert interviews* were the following:

- Most important future development needs of SMEs in electronic commerce
- Position of SMEs and larger enterprises/companies in future e-commerce markets
- Differences in the qualification requirements of SMEs and larger enterprises/companies
- Comparison of the qualification requirements of e-commerce start-ups and more traditional enterprises
- Opportunities and challenges of networking and outsourcing
- Ideas on the development opportunities and challenges of educational and training systems and the anticipation of qualification requirements.

Already in the first round of the interviews, it had turned out difficult for the representatives of small enterprises to analyse the different themes and subthemes of the analyses at a very detailed and specific level. Nevertheless, their questionnaire was designed to be demanding also on the second round. Although all the representatives were not always able to give a very detailed answer to a specific question, demanding questions forced them to focus and concentrate on disciplined thinking, which helped to produce interesting and systematic information. Overall, the second round of interviews of *the representatives of enterprises* concentrated on the following main themes:

- Position of SMEs in the future e-commerce markets
- Specified thematic qualification requirements of SMEs in electronic commerce
- Opportunities and challenges of networking and outsourcing
- Public sector and its role in the development of electronic commerce and related qualifications in SMEs.

For a more detailed look at the questionnaires used in the interviewing process of this study, the original questionnaires used in the interviews of experts and representatives of enterprises in the first and second round of data gathering have been translated from Finnish to English, and they can find attached to this reporting as Appendices 1-4.

The interviews of both Delphi groups were conducted in February-March 2000 (first round), and in October-November 2000 (second round). Thus both rounds included 25 systematic interviews (15 with experts and 10 with the representatives of enterprises), leading to the overall amount of 50 interviews. A fact that had an impact on the data gathering process was the geographical distribution of the Delphi group members. They were located in different parts of Finland and could not be gathered together due to limited time and monetary resources, long distances and schedule problems. On the other hand, the members of the Delphi groups were deliberately not informed of the other group members, in accordance with the principle of anonymity (e.g. Kuusi 2002, 219). Still, interpersonal contacts were arranged between the researcher and almost all the interviewees. For practical reasons, a small minority of interviews had to be conducted by telephone interviewing, which is a method

that has been commonly used when interviewees are geographically dispersed (Hair et al. 2007, 208-210). Here, the method was such that the interviewee was first contacted by a telephone, time for the interview was agreed on, and the interviewee was sent the interviewing questionnaire beforehand to help preparation and to improve the quality of the answers.

The chosen Delphi-type interviewing and research method required active contact with the interviewees. The personal contacts of the researcher with the interviewees during the research process can be summarised as follows:

- First telephone contact: explanation of the research, its aims and methods, stressing confidentiality and importance of participation. Also the schedule for the first interviewing round was agreed with each interviewee.
- Sending of the interview questionnaires of the first Delphi round by post, a couple of weeks before each interview. So, the interviewees were informed beforehand about the questions, and they had time to get prepared.
- On the agreed dates and times, the first interviews were conducted and data collected.
- Based on the notes, the data was gathered together, analysed and reported. The reports of the first round of interviews were sent to the interviewees and they were given a chance to comment.
- The interviewees were contacted by telephone, and they were once again asked to give potential comments on the results of the first round. At the same time, the schedule for the second round of interviewing was agreed with each interviewee.
- Based on the results of the first round, the interview questionnaire for the second round was revised and tested. After this, the questionnaire was sent to each interviewee approximately two weeks before the agreed time of the second interview.
- On the agreed dates and times, the second round of interviews was made and data collected.
- Based on the notes, the data was gathered together, analysed and reported. The reports of the second round of interviews were sent to the interviewees and they had a chance to comment them.
- A report of the Delphi results was posted to the interviewees, and they were once again thanked for their participation and contribution.

An important choice related to data gathering was also the technique of saving the collected data and information from the interviews. For practical reasons, it was decided not to audio-record the interviews. It was feared that audio-recording would negatively affect the interviewing situation, and it would potentially stagnate the interaction between the researcher and the interviewees and inhibit some interviewee responses (c.f. Saunders, Lewis & Thornhill 2007, 333-335). A few members of both Delphi groups openly expressed their reluctancy towards recording when it was asked from them beforehand, which reflects that the problem of reactivity, i.e. the situation where people change their behaviour in the research situation, can be especially important in business research, where research may touch areas that are considered business secrets etc. (Koskinen, Alasuutari & Peltonen 2005, 52-56). Also this can be seen as one of the reasons why the risk of recording the interviews at the potential expense of their quality was not taken, and the idea of recording was rejected at an early stage of the planning of the interviews. Instead, careful notes were made during each of the interviews, which was a demanding task, but the notes were also

controlled by asking the interviewees to verify that they were understood right after the discussion of each topic (c.f. Saunders, Lewis & Thornhill 2007, 334). It can be said that the interviews were successful, which was enabled by the described practices, including and open and honest pre-interviewing communication with the interviewees, where the aims, methods and relevance of the research were explained and confidentiality was stressed. (c.f. Koskinen, Alasuutari & Peltonen 2005, 57).

Conceptual choices and operationalisation of the qualification requirement concept

Like many studies in the different fields of social sciences, also this study involves a number of rather abstract concepts (Black 2002, 15). As pointed out earlier, qualification requirements as a concept is difficult to exactly define, and they can be approached from various perspectives. Still, operationalisation of this challenging concept was required for the purpose of conducting the empirical analyses (c.f. Hirsjärvi, Remes & Sajavaara 2008, 150-151). For this part, the construction of the research setting can be said to have followed deductive logic to enable the measuring of a number of chosen qualification requirements. Here, the principle of reductionism was followed in the sense that for the purposes of the analyses, the concept of qualification requirements was reduced to include only certain elements that define and limit the content of the concept in the chosen setting of empirical analyses (Saunders, Lewis & Thornhill 2007, 117-118).

In any research, the choice of concepts, their definitions and relationships with one another are an important question. Related to the concept of qualification requirements, one of the most important choices in this research was to focus to analyse *qualification requirements mainly at the level of SMEs as entities*. This can be considered as a brave and potentially risky decision, since in literature and earlier research, qualifications and qualification requirements have been mostly analysed from the viewpoint of individuals. Still, one important justification for the made choice is that also in the literature the emphasis has been switching increasingly to a more mutual level when concepts like qualifications, know-how and skills are analysed, developed and utilized (e.g. Argyris & Schön 1996; Otala 1996; Ruohotie 2002; Senge 1994). In enterprises, the qualifications of an entity are naturally still a construction of the qualifications of individuals, but for success, it has been considered necessary that the qualifications of individuals are successfully integrated to serve the overall objectives of the enterprise (c.f. Väärälä 1998, 21). Also from this viewpoint, the choice of having an enterprise as the basic unit in a research of qualification requirements could be considered justified.

The operationalisation of qualification requirements was hence problematised by the multidimensionalism and a partially abstract nature of the concept. When developing the construct to represent qualification requirements, as a part of the operationalisation process, the validity of the research had to be taken into consideration (c.f. Hair et al. 2007, 144-145). Accordingly, the chosen conceptual parameters had to be constructed in a way

that is relevant and illustrates the research phenomenon (Hirsjärvi, Remes & Sajavaara 2008, 151). On the other hand, the practical constraints of information gathering and analysis also had to be remembered, and to avoid bias, it also had to be ensured that the representatives of the both Delphi groups understand the chosen research approach and the meaning of the concepts that were used in the interviews.

To build a systematic analytical framework for qualification requirements, in this study they have been divided into certain qualification areas that are based on different functional areas of electronic commerce. The chosen areas and their subareas were also used as the basis for a quantitative analysis of the importance of different qualification areas in electronic commerce of SMEs. This kind of concrete and practically-oriented, function-based approach to qualification requirements can also be justified by the objectives of this research. Also, the approach was supported by the interviewees, who found the chosen categorisation of qualifications under certain areas and their subareas purposeful and interesting. Further, based on the practical experience during the research process, it could be argued that a more theoretical or abstract approach to qualification requirements would have produced weaker results from the viewpoint of the research interests of this study. The chosen functional approach helped the interviewees to connect the research concepts meaningfully to the functions and activities that were considered important from the viewpoint of e-commerce and business. The interviewees also expressed that when put together, the chosen areas and subareas describe a consistent combination of the qualifications required from an enterprise in electronic commerce (c.f. Rauhala 1993).

According to the chosen functional approach, the qualification requirements were thus first grouped into appropriate main areas that were considered important for well-functioning electronic commerce. The classification was made in cooperation by the researcher and a small number of commenting experts, and the final classification was formulated as a result of this kind of collective creative thinking. To enable detailed qualitative analyses of the content of different categories, it was also decided to further divide the chosen main areas into a number of more specific subareas that were considered appropriate. Especially at this stage of the research process, the ideas of cooperating experts were invaluable for the researcher to build a relevant classification. Before the final approval and the start of actual Delphi interviews, the classification and the overall structure of the interview questionnaire was still pretested by three test interviews (c.f. Hair et al. 2007, 278-279). When their results were good, it was decided to continue with the chosen classification, which is described in more detail in paragraph 6.2.

Measurement methods

Another challenge in a research, which deals with multidisciplinary and partly abstract phenomena, is the construction of appropriate measurement methods and tools. The question of measurement was further complicated by the fact

that the aim of this research was to analyse qualification requirements of SMEs in electronic commerce both in quantitative and qualitative terms. The Delphi has been seen as a good tool to combine qualitative and quantitative research approaches together, but a construction of a numerical research setting for the quantitative parts is still required (c.f. Bowles 1999; Hasson et al. 2000).

In this study, the quantitative parts were measured based on the use of five-point ordinal rating scales. These scales have been considered suitable for human-oriented research, and they enable the calculation of simple statistical parameters (c.f. Erätuuli, Leino & Yli-Luoma 1994). Five-point ordinal rating scales have been used also in Delphi-based researches, and they have been considered as good tools also to assess e.g. the unanimity of the Delphi group members, if it has been an objective (Hasson et al. 2000; Mead & Moseley 2001).

In the analyses of the significance of different qualification categories and their subcategories, the five-point ordinal rating scales were constructed to range from 1 to 5. In the case of questions, which were based on the use of these scales, time and space was also provided for additional comments of the interviewees, which for its part provided valuable qualitative information, which was complementary to the expressed quantitative information and also raised further discussion. In terms of the scales, similar five-point ordinal scales were used both in the first and second round of the Delphi technique, which was also considered beneficial from the viewpoint of consistency.

Analysing methods and analysing process

Both in the first and second rounds of the Delphi, both quantitative and qualitative data was collected to a data set, which then had to be analysed further. As described earlier, the quantitative data was based on the use of five-point ordinal rating scales, e.g. to analyse the importance of different qualification requirements, ability of different educational and training systems to respond to the qualification requirements etc. This data could be analysed relatively simply by using traditional statistical methods, which were in this case restricted to the reporting of most important descriptive statistical measures of central tendency and dispersion (mean, standard deviation, mode, minimum, maximum) of the results to provide information on the distribution of the data (c.f. Hair et al. 2007, 316-321). Neither the small sample nor the other construction of the research setting did allow a reliable use of any deeper statistical analyses, to test whether the means values of the data from the two Delphi groups differ from one another etc. Anyway, these kinds of analyses were not among the original aims or intentions of this study either.

In turn, in qualitative research, there are not as precise and exactly defined methodologies to interpret the results as in the case of statistical research (Koskinen, Alasuutari & Peltonen 2005, 229; Yin 2003, 35). It can be said that the objective of qualitative data analysis is to identify, examine, compare and interpret patterns and themes (Hair et al. 2007, 291). Also, in the case of qualitative research data, its collection and analysis are typically closely related. Therefore, in qualitative research a lot of attention should be paid to the quality

of the research and its overall process. This requires a careful setting of both data collection and data analysis and interpretation, as well as a clear description of the procedures used to interpret and organize the data.

A challenge in qualitative research is coding, which is aimed to facilitate understanding of the data. The result of coding should be to enable the researcher to link data with research topics, themes, concepts, ideas and other higher order abstractions so that the data could be manipulated, organised and categorised. (Hair et al. 2007, 292.) Coding is related to the challenges of finding appropriate ways to conceptualize and reduce data, to elaborate categories in terms of their properties and dimensions, and to relate data (c.f. Strauss & Corbin 1998, 11-12). A well-constructed data coding system can be seen to increase the reliability of interpretation, which is an important question in qualitative research.

Data reduction in qualitative analysis involves selecting, simplifying and transforming the data to make it more manageable and understandable. Data reduction should be guided by the relevance to research questions, and it should also aim at data display so that the information is organised in a way that facilitates understanding of meanings and drawing conclusions. (Hair et al. 2007, 292-293; Saunders, Lewis & Thornhill 2007, 470.) As described, in this study the data collection was strongly based on categorisation already at the phase of data gathering, i.e. interviewing, under a number of predetermined themes. Also, the classification of qualification requirements into a number of main areas and their subareas can be seen to be related to a deductive approach on qualitative analysis process. The use of a semi-structured data gathering technique with a kind of predetermined conceptual framework can also be said to relate this study to a deductive analytical procedure of explanation building (c.f. Saunders, Lewis & Thornhill 2007, 489-491). This idea is also supported by the use of the Delphi technique involving two rounds, which can also be considered as certain kinds of iteration rounds. On the other hand, the analyses also include inductive elements, since within the areas and subareas that were deducted from the concept of qualification requirements, the content and importance of each area was approached inductively by generating data and then analysing and reflecting upon what theoretical themes the data are suggesting (Saunders, Lewis & Thornhill 2007, 119-121).

In the different stages of this research, the qualitative data analyses were started by a preliminary look at the research notes and memos based on the conducted Delphi interviews. After this, a more careful reading of the notes was done to have a better overall picture of the data. This preliminary phase helped to outline the main contents of the data and supported proceeding into the deeper phases of analyses. In the deeper analysing phases, the data was then carefully analysed under different categories and classification according to the main principles described above. Gradually the data was reduced with an aim to find the most important content under each of the analysed themes and research questions (c.f. Koskinen, Alasuutari & Peltonen 2005, 232).

Especially after the second round of the Delphi interviews, the main emphasis of the analyses turned into a deeper content analysis of qualitative research data, which was aimed to be interpreted in a relevant manner. In the analysis, no special computer programs were used, but the content analyses were conducted manually and by the help of Microsoft Word and Excel programs, which helped to classify and categorise e.g. the findings related to each analysed subarea of qualification requirements. With the chosen research questions in mind data was examined and coded under relevant groupings, written draft reports and summaries were made, at the same time trying to generalise the ideas from the interviews, but at the same time also sticking to the exact original ideas, and even phrases, of the interviewed persons where it was found appropriate. As an end result, the combined ideas were reported by the chosen structure with an aim to find the essential out from the rich data. The chosen data approach to data analysis here emphasised the finding of most interesting qualitative content, but for example exact quantification of how many times a certain thing was mentioned in the answers was not found relevant to include in the analysis or the reporting, although also for the purposes of validity, efforts were made to distinguish the dominant patterns from the less often mentioned themes under each question of analysis.

An important part of good argumentation is also to discuss the results of a research with the earlier findings and interpretations, and hereby position the results in scientific discussion. In addition to the two-round Delphi interviewing process, other sources of information in this study include relevant literature, research reports and articles, as well as available statistics. Hereby, the aim has been to formulate a strong theoretical framework for the research, and also to enable the comparison of my research results and previous results and viewpoints. This is also related to the argumentation of contribution, and which contribution a research has been able to provide to science (Koskinen, Alasuutari & Peltonen 2005, 251).

5 RESULTS ON DEVELOPMENT TRENDS AND CHALLENGES OF E-COMMERCE IN SMES

This chapter starts to report the empirical results of this study, concentrating on the development trends and challenges of doing e-commerce. The reporting proceeds from the description of the megatrends of e-commerce to a more specific qualitative analysis of the e-commerce challenges of different kinds of SMEs.

5.1 Megatrends of electronic commerce and their impact on SMEs

An interesting and well-known term in futures research is a megatrend, which can be seen as a major transformation taking place e.g. in society or economy (Naisbitt 1982, 11). A megatrend has also been defined as a combination of smaller trends or phenomena that form a pattern or an emergent development force that has a certain direction and that can be expected to strengthen over time in terms of prevailance and power (c.f. Kamppinen, Malaska & Kuusi 2002, 33; Mannermaa (toim.) 2000, 92; Mannermaa 2004, 73). Megatrends can also be defined as large, over-arching directions that shape our lives for a long term (e.g. Aburdene 2007; Naisbitt 1982). Megatrends evolve more gradually and over a longer period of time, and they also change less rapidly, than general trends. Generally, megatrends can be related to different kinds of economic, social, political or environmental changes.

The term megatrend gained publicity as a result of the famous work of Naisbitt (1982), where he defined ten significant megatrends for the 1980's, and outlined the long-term perspective of how the prior industrial society turns to an information society with new characteristics. Later, Naisbitt & Aburdene (1990) continued this work with a new focus, and outlined ten new directions shaping the world in the 1990's on the way towards a new millennium. Further, Aburdene (2007) has continued the discussion by new ideas of the megatrends

until the year 2010, emphasizing the role of human consciousness and conscious capitalism that transform business and enterprises in (and also beyond) the information economy. As interesting background information, Table 6 presents a summarizing collection of the key megatrends as presented by the above mentioned well-known authors.

TABLE 6 A summary of presented megatrends

Naisbitt (1982)	*Naisbitt & Aburdene (1990)*	*Aburdene (2007)*
1. Shift from an industrial to information society	1. Booming global economy	1. Increasing power of spirituality
2. Shift from forced technology-push to technology pull	2. Renaissance of the interest in arts	2. Dawn of conscious capitalism
3. Shift from predominantly national economies towards a global one	3. Emergence of free markets in socialist economies	3. Leading from the middle
4. Shift from short-term perspectives towards long-term perspectives	4. Increasing similarities in global lifestyles combined with increasing cultural nationalism	4. Spirituality in business
5. Shift from centralised towards decentralised and flatter structures	5. Privatisation of the welfare state	5. Values-driven consumers
6. Shift from institutional help and services towards self-reliance and self-help	6. Increasing influence of Pacific Rim countries	6. Wave of conscious solutions
7. Shift from representative to participatory democracy	7. Rise of women in leadership positions and roles	7. Socially responsible investment boom
8. Shift from hierarchies to networking	8. Rise and progress of biotechnologies	
9. Shift from a northwestern bias to sputhwestern one	9. Religious revival	
10. Shift from either-or thinking to more choices and variety of thoughts	10. "Triumph of an individual", increasing individualism	

As a result of an increased popularity of the term and a grown interest in the research of megatrends, various other presentations of megatrends have also been published for societies and economies in general, but also for different industries, geographical areas, specific themes etc. This also illustrates how it is possible, and often beneficial, to proceed from general megatrends to more specific analyses. Generally, internationalisation, a shift towards network economy, changes in production and work processes, technological development, social development and political development have been presented as megatrends that have a high influence on societies, and also on the quantitative and qualitative demand for future qualifications. Achtenhagen (1998, 135-136) has presented both more exogenous (mega)trends such as demographic patterns or the individualisation of values and more endogenous trends like the internationalisation of the economy, an increase in research and the transformation of its results into technologies, the increasing use of new ITC technologies and the world-wide use of resources that may pose challenges to

work markets, as well as education and training, and call for changes in structures and practices.

As examples of the research and use of megatrends in Finland, one could mention a large project where labour market scenarios were made, and the chosen megatrends of globalisation, networking, sustainable development, a shift from industrial work to information work, changing role of the public sector, ageing of the population, increasing risk of marginalisation from society, and technological development were used as a framework for analyses (Stenlund (toim.) 1997). Also, the development of the different clusters in the Finnish economy have been analysed in the light of emerging megatrends (Hernesniemi 2000). In Finnish literature, Kuusi (1999) has also described significant general megatrends that have an impact on the development of qualification and competence requirements, and describes them as an increasing use of intelligent and flexible machines, a growth of scientific and technical information, a growing internationalization of business and enterprises, a rise of post-industrial needs that increasingly shape people's behavior, and an increasing meaning of nature as capital. More recently, in Finland there has also been an interesting project, which discusses the meaning of megatrends that were classified into three main groups: world economy and Finland, consumers and markets, and technology and innovations (Ahola & Palkamo 2009).

In business, megatrends may shape the operational environment and have impacts on decision making, strategies, work organisation, business results etc. It has been argued that if enterprises do not respond to megatrends and develop strategies accordingly, they may be left with outdated offerings and practices, and they may miss new opportunities (Sultan, Mantese, Ulicny & Brown 2008, 29). In turn, by recognizing, analyzing and anticipating megatrends, enterprises can try to find new business opportunities, figure out development roadmaps, and thus aim to ensure survival, growth and development. Although from the viewpoint of SMEs, megatrends are typically external factors in the operational environment, which SMEs cannot have a lot of influence on, also for them it would be important to aim to recognise significant megatrends and take them into account when planning and adjusting business and its operations (Mannermaa (toim.) 2000, 92).

In this study, megatrends have been included as an important set of factors that have an impact on the development of and opportunities for electronic commerce. In general, the development of commercial sector has been seen as tightly connected to the wider developments and changes in society and the business environment. On the other hand, the companies and enterprises in the commercial sector want to shape their environment and also actively try to influence customer behaviour (e.g. Itkonen 1996, 1). These principles can be argued to apply both to traditional commerce and electronic commerce. Hence, when analysing the development of electronic commerce and aiming to support proactive development of SMEs, it can be considered highly important to understand wider development trends (c.f. Mannermaa

(toim.) 2000). Megatrends can have different impacts on the development of electronic commerce and its qualification requirements, although the development of electronic commerce is characterised by a rapid pace and turbulence, which in some occasions have also been presented as a kind of megatrend (c.f. Remes 1993, 156-157).

In this study, the approach to megatrends is not general, but it has been narrowed down to the context of electronic commerce. In data collection, a discussion on megatrends served as a kind of introductory question part, and led the interviewees into a deep thinking of the "big picture" of the research context, i.e. electronic commerce. This focused the thinking of respondants to the context, and formed a good background to proceed into later research questions on qualification requirements (c.f. Hasson, Keeney & McKenna 2000; Whitman 1990). Accordingly, in the first round of expert interviews, the chosen experts were asked to name the megatrends that they consider most important for the future development of electronic commerce. The original intention here was also to separate short term and long term in this analysis, but also related to the typically gradually strengthening nature of megatrends it turned out very difficult or impossible. In general, the interviewed experts considered it demanding to anticipate the development of such a rapidly changing phenomenon like electronic commerce in the long term. A general view was that many of the presented megatrends are such that they are present also in the short term, but they will most likely continue and even intensify in a longer term. Hereby, they can also be argued to meet important criteria for the use of the term megatrend (c.f. Kamppinen, Malaska & Kuusi 2002, 33; Mannermaa (toim.) 2000, 92).

According to the conducted expert interviews, the most important megatrends affecting electronic commerce and its qualification requirements turned out to be the following:

1. Globalisation of business and widening markets

This megatrend is related to the fact that economic and business environment is increasingly global and enterprises operate in more and more international and networked markets, where the role of traditional borders seems to be diminishing. Simultaneously, at least in principle, the meaning of geographical location decreases in business, and enterprises can gain access to wider markets and customers are also able to choose between different suppliers. (e.g. Dutta & Evrard 1999). Changes in trading boundaries have already had a significant effect on the ability of SMEs to cross national borders and broaden their markets. Partly related to this, many SMEs have also adopted e-commerce to enable them to exploit wider markets (Dutta & Evrard 1999; Stockdale & Standing 2006). Thus, also from the viewpoint of SMEs, e-commerce has been described as a gateway to increasingly global business and markets (Ramsey et al. 2003).

The interviewed experts saw widening markets to open new opportunities. Nevertheless, simultaneously it was seen that competition can become increasingly tense, which may cause downward pressure on price

levels. Important questions related to electronic commerce and globalizing markets were also mentioned to include e.g. international taxation, legislation, international business rules, security etc.

From the viewpoint of qualification requirements, the meaning of language skills and the understanding of international business culture was emphasised. On the other hand, the experts anticipated that localisation and the knowledge of local markets can become an asset that can be used by SMEs as a weapon in global competition. In fact, it was mentioned in one interview that there are already some "weak signals", i.e. early signs or symptoms (c.f. Hiltunen 2000; Kuusi et al. 2000; Mannermaa 2004; Moijanen 2003), of customers' increasing respect also for locality as a counterforce to globalization.

2. Integration of technologies and business processes

This megatrend is based on the interviewed experts' view that different e-commerce and other ICT-based technologies and channels will converge and their borders will become increasingly blurred in the future. E.g. information technology, telecommunication and media industries were expected to converge and increasingly melt into large, complementary activities to provide new kinds of integrated service concepts. In terms of infrastructure, it was also anticipated that different kinds of data channels will also gradually become integrated with one another. In a couple of expert interviews, this idea was also connected to a trend in organizations to develop different business processes into increasingly integrated systems. A well-built and utilized electronic commerce interface and its background systems were seen to play a potentially important role in this process, and they were seen to become an increasingly natural part of daily business operations (c.f. Ruohonen 2005; Zhu, Kraemer & Xu 2003).

3. Increasing use of mobile technologies

The experts' idea of the use of mobile technologies as a megatrend is based on the assumption that in the future the use of mobile devices and wireless technologies in electronic commerce will increase faster than traditional pc-based electronic commerce. In fact, mobile commerce (or m-commerce) has already become a well-known term of its own (e.g. Bhatti 2007). In a number of interviews, the development of mobile technologies was emphasised to open new opportunities and make both business processes and customers increasingly independent of space and time.

In Finland, the opportunities of mobile commerce were seem especially tempting, since already at the time of the interviews customers were to some extent used to paying for mobile services. Hence, the paying willingness on the mobile side was assumed to be higher than in the "traditional" Internet, and the markets and the supply of mobile commerce services was expected to grow continuously also in the future. As technologies develop further, more and more sophisticated solutions were also anticipated to be enabled and to evolve. Consequently, the role of mobile solutions in electronic commerce was expected

to continually increase, and also to enhance the growth of the overall e-sales volumes for its part.

4. Evolution of new business models, also in old businesses

The interviewed experts expressed a strong belief that electronic environment will have significant effects on the success factors of businesses, which creates opportunities for new business models (c.f. Horsti 2007; Järvelä & Tinnilä (toim.) 2000; Lucas 2002; Tinnilä et al. 2008). It was seen very likely that new business models for electronic commerce will be continually developed in the future, and a part of the old and inadequate ones are going to be replaced. In this process, it was seen possible that e.g. the value chains and earnings logics of enterprises may face considerable changes. In tight competition, the importance of innovative business concepts, business competency, and customer-oriented and loyalty-promoting content was expected to grow further.

Not surprisingly, the experts highly emphasized the role of customer relationship management, also as a consequence of the growing power of customers in increasingly transparent markets. The interviewed experts saw that especially in the long run enterprises should learn to exploit the new possibilities of electronic commerce, develop value creating customer service concepts, redefine their customer contact channels, integrate processes, find new logistical solutions etc. Overall, what the experts expected from enterprise was a truly entrepreneurial attitude with risk-taking ability, willingness to experiment and courage to invest in new systems and solutions (c.f. Koiranen & Ruohotie 2001). Related to his, the expectations also included good management and leadership, and the ability to see their businesses in a new way and to reinvent them in the new environment (c.f. Hamel 2002).

In the expert interviews, it was also a very common view that electronic commerce will cover more and more products, industries and business sectors in the future. The interviewed experts felt that basically all businesses are under a growing change pressure, and it was anticipated that in the long term a very significant part of all commerce will be electronic commerce. The development to this direction was seen especially rapid in business-to-business markets, but more gradually also in business-to-consumer markets. Overall, the Internet and electronic commerce were seen to enable new ways of thinking and also potentially radical trials in business. Also in the future, a part of these trials are likely to be successful, but for one reason or the other, a larger part will fail like in more traditional markets. According to the interviewed experts, the success potential in may also depend strongly on the case and the type of business. Especially in consumer markets, it was seen very important that the products are or become renowned, which may also strengthen the position of well-established and highly-branded products at the expense of less well-known products of small enterprises. However, the experts felt that there is room also for new products, as long as the target groups are clearly defined and the customers are provided with some added value.

A very important factor for the development of electronic commerce in many product groups was considered to be logistics. The experts anticipated that a growing number of products will be delivered in electronic form, but naturally this will not be possible in all product groups. For example, one such product group is groceries. As potential new, or potentially reinventionable, delivery options the interviewed experts mentioned direct delivery of goods to homes, working places or special pick-up places. Also they anticipated that people would increasingly order their groceries readily-packed through the Internet (c.f. Berg et al. 1999, 86). All in all, the experts believed that both the supply of and demand for many products and services, including public services, by electronic channels will grow tremendously in the future. In a growing number of traditional industries, the impact of the Internet has already been high, and the interviewed experts anticipated this trend to continue and expand to a growing number of industries. Especially those industries where products are easy to deliver and suit well to electronic commerce were expected to be under growing change pressure (e.g. music business etc.). This was also seen as a threat to a number of small and specialised traditional shops. On the other hand, it was anticipated that especially many middle-sized traditional shops that cannot fully exploit economies of scale, but are not highly specialised either, will be under a growing pressure and forced to rethink their business concepts.

5. Increasing role of services and change of demand structures

A phenomenon, which is also visible in traditional markets, is that the role of services both as a source of competitiveness in business, and as an object of purchase is intensifying. Consumption has shifted increasingly to services, which has already for a longer period also raised concern about a potential slowdown in the growth of the sales of physical products (e.g. Kaupan keskusliitto 1999). Services can also create substantial added value in electronic commerce, when enterprises try to acquire loyal customers in the environment, where competition is transparent and the offerings of competitors are easily and quickly available.

According to the interviewed experts, the success in the future electronic commerce markets typically requires emphasized service orientation, so that the individual needs of customers can be responded to, and customers can be given some extraordinary value. It was also expected by the interviewees that there will be considerable changes in both the structures of consumption and the needs and expectations of customers. For example, in the consumer markets, the consumption habits of young generations were already seen to differ quite considerably from older generations. In the future, the consumption of individuals was expected to differentiate further, and the trend was expected to be towards increasingly custom-made, tailored and personalized products and services. One of the phenomena that the experts were emphasising was that the sales of services is growing fast also in the electronic markets, partly at the expense of traditional physical products, but also as complementary parts of

product packages. Overall, the role of services as a value adding component was seen as a significant determinant of customer behaviour and experience. It was also expected that as technologies develop further, it will further increase the possibilities to sell e.g. new kinds of electronic micro services, where small payments can create high levels of income for service providers, service content producing enterprises etc. Examples of this already include ringtones, localisation services, electronic paying services etc.

6. Multi-channel solutions and the importance of channel management

In the expert interviews, one of the central trends was also considered to be the need of businesses for appropriate multi-channel solutions and multi-channel management (c.f. Evans & Wurster 1999; Tinnilä et al. 2008; Tinnilä, Öörni & Raijas 2006; To & Ngai 2006). Traditional pc:s will be accompanied by an increasing number of new types of devices with Internet connections, like different mobile devices, potentially also digital television etc. In this situation, a smooth and simultaneous management of these different channels was seen to play a central role from the viewpoint of creating positive customer experiences. This requires a successful integration of different information systems and a careful design of both channel-specific and inter-channel business and communication processes. Hereby, companies and enterprises can try to guarantee that customers are provided with similar service regardless of the channel, and the actions through one channel are known and registered also in other channels, so that so called channel conflicts could be avoided. If this succeeds, it was considered to promote customer relationship management, and e.g. help to utilise information on customers and their preferences. On the other hand, the interviewed experts commonly expressed that failures in this area can jeopardise customer relationships and mistakes can be costly and also endanger the reputation of an enterprise in the eyes of the customers. Also, especially in the case of traditional enterprises with physical outlets, it was emphasised that channel management can also help to avoid the potential problems of new channels "cannibalising" the sales of traditional channels by e-sales.

7. Cooperative networks and partnerships

As an important continuing trend, the importance of partner networks was also expected to grow further in the future. Through cooperation and networking, enterprises can share know-how, flexibility of activities, and improved reacting ability. According to modern business ideas, enterprises are often recommended to concentrate on their core competencies and their own specialised role in value chains, and outsource other activities to chosen cooperative partners (c.f. Hamel & Prahalad 1990). Also international outsourcing opportunities may also be further intensified by the megatrend of globalisation.

According to the interviewed experts, it is likely that different, and also new kinds of, strategic alliances will constantly increase both nationally and internationally. Also, cooperation between direct competitors was expected to increase substantially. The role of cooperative networks was seen especially

important for SMEs, whose own monetary and other resources are typically relatively small.

In the comments of the interviewed experts, it was also expected that the role of centralised shopping sites and portals might increase. This was justified by emphasising their role as important places to gain visibility in the Internet, though the expected benefits from the viewpoint of an SME should also be weighted against the costs. Also, the experts highly emphasized that networking per se should not be seen as any automatic solution to succeed in the Internet environment. Related to qualification requirements, it was nevertheless considered important to develop networking skills, as well as network management and leadership skills. It was also seen that the more networked an enterprise is, the more important it is to invest in these skills. Still, it was also mentioned that they should be taken seriously in virtually any enterprise, especially since the whole society seems to be moving towards a more and more networked operational culture (c.f. Castells 1996; Kivinen et al. 2003; Luomala et al. 2001).

8. Increasing need for rapid reacting to changes or proactive behaviour

According to the interviewed experts, it is an inevitable consequence of a rapid and continuous development of e-commerce technologies and business models that the ability to react quickly to changing conditions, or act proactively, will be further emphasised in the future electronic commerce. Enterprises should be able to anticipate and evaluate the development trends, assess what they mean for their own businesses, and change direction if need be (c.f. Mannermaa (toim.) 2000). This also leads to a growing need to anticipate qualification requirements for enterprises to be able to proactively develop the necessary skills, competencies and capabilities. To enable this, an increasingly important factor was also seen to be the ability of entrepreneurs and managers to motivate their personnel to continuously develop themselves.

9. Structural changes in commerce and increasing knowledge-intensity

Traditionally, commerce has been a very important sector in terms of employment, and despite structural changes it has been a major source of new jobs also recently. Still, in the long run both wholesale and retail have characteristically been seen as sectors of major structural changes, where the development of employment is difficult to anticipate (e.g. Hernesniemi 1997; Itkonen 1996). Commerce has also been sensitive to economic fluctuations, and in the periods of recession the production and employment in the commercial sector has often fell more than in many other sectors (Itkonen 1996, 5). The operational models in commerce have also been changing considerably, and new models have usually emphasised cost efficiency and cost savings (Itkonen 1996, 71).

As described earlier, by their nature megatrends are such phenomena that SMEs cannot typically affect them, but instead it would be important also for SMEs to recognise them and their potential implications for their businesses and its development. It can be argued that the described megatrends may have

even significant impacts on the future qualifications, competencies and learning needs of SMEs in electronic commerce. For example, in the expert interviews, it was believed that the described megatrends combined to the growth and development of e-commerce may intensify the overall structural change in commercial sector, which emphasises the need of SMEs to adjust and develop appropriate qualifications and competencies. Many of the interviewed experts foresaw that in the future practically all commerce will be increasingly net-based, and customers will automatically expect enterprises, as well as the public sector, to provide net-based services. Then a big question is, whether SMEs and other organizations will be prepared for this. Also, it was visioned by a part of interviewed experts that some of the traditional products or services (like routine bank services) may be sold mostly only over electronic channels in the future. On the other hand, it was expected that the consuming habits of older and younger generations may differ substantially (c.f. Itkonen 1996, 71; Melkas 2004). Also, it was expected that in all sectors of commerce, traditional intermediaries may be forced to change their shape or role, or otherwise in danger to lose their meaning in value chains and their need for existence. A long term overall trend that the experts commonly agreed on was also that electronic commerce and traditional commerce will converge and finally integrate into one.

The above described megatrends, as found in the conducted expert interviews, illustrate the phenomena that also SMEs should take into consideration and get prepared for as a part of their future-oriented strategic development work. Different megatrends may have diverse impacts on enterprises, depending on industry, size, business life cycle and other potential business- and enterprise-specific factors. Nevertheless, in basically all SMEs, active considerations would be needed in order to understand how these (or other) megatrends affect that particular enterprise, its future business and e-commerce opportunities. Then, after the recognition and analysis of megatrends, appropriate development actions could be taken to tackle the future challenges at the present to safeguard the success potential of the future (c.f. Mannermaa (toim.) 2000, 92; Sultan et al. 2008, 29).

5.2 Position of SMEs in electronic markets

In literature, it has often been suggested that the implementation of new technologies, in this case e-commerce, can help SMEs to cope with their operational environment and provide a number of opportunities (e.g. Barry & Milner 2002; Chaston 2004; c.f. Greenstein 1999). Still, it is important to remember and assess the special characteristics of each SME to find the most appropriate ways to develop e-commerce activities that fit e.g. the size and scope of each enterprise's business (c.f. Zhu, Kraemer & Xu 2003).

In the interviews of this study, the representatives of the enterprises were asked about their motives to start electronic commerce and enter electronic markets. In addition to the benefits commonly mentioned in the literature, central motives included general willingness to develop the business and to be involved in ”new things”. It was also hoped that customer information and customer service could be improved by the use of electronic channels, and new markets and new kinds of competitive advantages were also wished to be reached. Many of the interviewees also felt that the changing operational environment has increasingly started to force enterprises, their own included, to enter e-business. Naturally, there were also differences between the motives of the enterprises that were established for and concentrated completely on electronic markets and were offensively operating only there, and the enterprises that had a history in traditional commerce and generally had a more defensive attitude towards electronic commerce.

An illustrative way to analyse the special characteristics of SMEs in electronic commerce is to use a traditional tool, SWOT –analysis. This analysis is commonly used in the analyses of different topics, and when used properly it can produce very valuable information for strategic planning and decision making. SWOT as a term refers to **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats (e.g. Bartol & Martin 1991; Johnson et al. 1989). A well done SWOT – analysis can help to understand and concretise its strengths and to take advantage of opening opportunities, as well as to understand its own weaknesses and different kinds of potential threats in the future. SWOT enables a simultaneous analysis of the (internal) present situation of the organisation(s) in question, and the positive and negative (external) factors. SWOT has also been used as a tool in the anticipation of the future, since it provides a simple and practical tool that combines the present and the future into one systematic framework (c.f. Ovaskainen & Ritsilä 2000). Since a SWOT analysis is relatively easy to implement, the method is also suitable as a self-anticipation and self-development tool in SMEs.

In this study, the representatives of SMEs were an invaluable source of micro level information on the observed position of SMEs in e-commerce. In the first round of the Delphi-type interviewing, the chosen representatives of SMEs were asked to make a SWOT analysis of their own enterprises from the viewpoint of electronic commerce. The result is a collection of viewpoints that represent the chosen enterprises, but can be argued to be relevant also for SMEs in more general terms. The results are interesting also because they include a variety of different ideas from the heterogeneous sample of small enterprises with different strategic choices in e-commerce. The interviewed enterprises were also in different maturity stages in their electronic commerce activities, which also meant that certain factors were seen as a strength in one enterprise but rather seen as a weakness in another enterprise. Also the opportunities and threats were seen somewhat differently, depending on the development stage and the role of e-commerce in the overall business of the enterprise. In any case,

the interviews revealed very interesting information on different SMEs and their ideas about themselves in relation to electronic commerce.

Based on the above described SWOT analysis conducted as a part of the Delphi interviewing with the representatives of the chosen SMEs, the results of the SWOT analysis can be summarised as follows:

STRENGTHS

- Flexibility, ability to react quickly to changes.
- Know-how, skills, professional and specialised staff in own business sector.
- Products that suit well to electronic commerce.
- Ability to give samples and testing opportunity in the Internet.
- Geographically wide, even global, markets.
- Potential savings in transaction costs.
- Quickness of updating e.g. pricing and other information.
- Wide selection of goods, reliable logistics.
- A well-established and good brand, good reputation and loyal customers.
- New opportunities to interact with customers, and reach potential new customers.

WEAKNESSES

- Still a relatively new and unknown player in e-commerce.
- Still a relatively small e-commerce customer base.
- Expensive and complicated logistics (physical products).
- A relatively small own stock, and a long distribution time for products that are not in own stock.
- Lack of monetary and other resources.
- Vulnerability of the e-commerce system, since only a very small group of personnel is qualified to run e-commerce activities, while others do not have needed qualifications and are also resistant to changes.
- Relatively weakly developed technical solutions, complex audit routines and payment systems.
- Active users of the Internet are not the most potential customer group for the enterprise and its products.
- Need to connect traditional commerce and e-commerce ties up hands and sets pre-conditions.
- Large investments have been needed, but they seem to pay back slowly.
- Lack of human service and lack of personal contacts with customers.

OPPORTUNITIES

- Continually developed and improved service concept attracts an increasing number of customers.
- Wide international markets enable the reach of customers in different locations.
- New technical solutions, like wireless technologies and new payment systems, open new opportunities and raise interest.
- Competitive position in the markets is continuously improved by building on own strengths.
- New business concepts can be developed and tested relatively easily.
- When customers get interested in electronic commerce, certain business transactions become easier.
- Further automatised logistics and other supportive systems give new potential to cost savings.
- Successful integration of traditional commerce and e-commerce creates a new kind of overall business concept to serve customers better than earlier.

THREATS

- Uncertainty of the future developments causes risks.
- Relatively small human resources and increasing lack of time.

- Problems related to standardisation and legislation of electronic commerce cannot be solved.
- Customers do not feel to get added value and e-commerce will not become profitable.
- Own market segments cannot be reached and the business concept will not become successful.
- Faith in the growth of e-commerce fades out.
- Worsening economic situation, recession, fall of demand.
- Markets are taken over by a small number of international companies with strong market power.
- Enterprise loses its role in value chains.
- Potential loss of customers, if e-commerce requires technical investments from them.
- Increased information security problems and Internet crimes.

To deepen the results of the SWOT analysis, on the second round of interviews the analysis of the position of SMEs in electronic commerce was continued with the representatives of the enterprises. New aspects were included in the analysis. First, there was a question about the problems that the enterprises had faced in their own electronic commerce activities. Second, the interviewees were also asked to think about potential solution to these problems, and further also to anticipate how the position of their enterprise is going to develop in the future.

Especially, many of the representatives of traditional enterprises emphasized the problems of profitability, and they felt that the benefits of electronic commerce had been too small compared to the costs. Thus, e-commerce was in some cases felt not to be able to fulfil the expectations. Especially in the smallest enterprises, the lack of time and insufficient qualifications were once again mentioned as significant problems. Most enterprises were strongly saying that their personnel did not have enough time and qualifications to run electronic commerce successfully without external services. Several representatives of enterprises also expressed that electronic commerce is not very popular among their important customer groups, and potential customers were also partly not able to use their Internet services. Hence, a big problem was seen to be that the Internet was not yet a natural part of the lives of large customer groups, although this situation was seen to be changing constantly. An area that was also found problematic is logistics, since especially in the case of physical products, cost-effective logistics and transport systems would often require a large customer base in a relatively small geographic area. Also, especially the small specialized shops felt that one problem of the Internet is hard, or even distorted, price competition. One of the interviewees also expressed worries that competitors are using the product information on the Internet pages of his enterprise for their own purposes, without any income or compensation to the enterprise that originally produced the information.

In the interviews, a potential solution to several of the presented problems was considered to be increasing integration of e-commerce related systems and processes. Also, there were hopes of additional personnel with special e-commerce qualifications, but mostly this was seen as financially impossible at

the point of time of the interviews. Interestingly, some problems were also seen to be solved partly automatically, when people get increasingly used to electronic commerce, technical interfaces become more user-friendly, the Internet connections develop faster and easier to use, and customers' attitudes also develop more positive to electronic commerce which may help to raise profits. This is also in line with the earlier findings that consumer readiness, i.e. willingness to buy online, is a significant factor increasing the interest of SMEs in e-commerce (Zhu, Kraemer & Xu 2003, 255, 264).

In any case, according to the interviewees, the enterprises commonly attempted to improve their e-commerce abilities and services, and to develop weaknesses and solve problems. Still, enterprises emphasised the role of consumer attitudes, abilities and behaviour as the most crucial factors determining the future success of their e-commerce. Here, it is thus interesting to see how important role was given to the demand side, although the original intention of the question was to concentrate more on enterprises themselves and the supply side.

The interviewees commonly shared the view that their electronic commerce activities had already been developing to a positive direction after the problems at the beginning. Several of the enterprises mentioned that the concept of their electronic commerce had become clearer, systems more accurate, and the number of customers and sales had also started to gradually increase. On the other hand, a part of enterprises felt that they were still seeking their position in the electronic markets. Although the enterprises felt that they already had beneficial experiences and electronic commerce practices had been learned through practice, the lack of human resources, qualifications and technical abilities were seen as significant factors that hindered their development. Many enterprises had some plans to invest intentionally in the continuing development of their e-commerce systems and services, system and process integration etc. Also, especially traditional enterprises named profitability of their electronic commerce activities as one of the key challenges and future objectives, which they were aiming to support especially by customer orientation and good service.

In the end, despite certain problems, a majority of the interviewees anticipated the position of their enterprise in the future electronic commerce markets to be relatively positive. Traditional enterprises were trying to defend their market positions by the further development of their electronic commerce sites as well as cost-effective marketing activities. In their case, the most important competitive advantages were found to be a known brand, existing customer relationships and personal service. On the other hand, especially the more offensive electronic commerce start-ups emphasised pioneering as a very important source of future competitiveness. Still, although SMEs generally saw potential new opportunities, there were also fears of large companies that may come, dominate and control the future electronic markets by their market power.

5.3 Strategic questions and critical success factors of SMEs

Also based on literature and earlier research, it can be argued that strategic business orientation is an important success factor in e-commerce. Successful e-commerce requires understanding of own business and the role of e-commerce in this business to make appropriate decisions, organise development activities and monitor the results (e.g. Ruohonen 2005). To tackle the potential of e-commerce to improve business performance, strategic decisions should be made on how to develop e-commerce applications that support an enterprise's competitive strategy (e.g. Fraser, Fraser & McDonald 2000; Karagozoglu & Lindell 2004; Tuunainen 1999). This also refers to using Internet technologies and e-commerce to tying an enterprise's activities together to integrate the Internet and traditional competitive advantages (Porter 2001, 78).

Overall, it has been emphasixed that business perspective should be emphasized in solutions, instead of a too technology-oriented approach (e.g. Tuunainen 1999). Also small businesses should thus not see the Internet purely as a technical tool, but rather as a business tool that can provide new opportunities to add value. Competitive advantage can be gained from appropriate adoption of e-commerce solutions so that they can respond to strategic business needs (c.f. Ramsey et al. 2003). E-commerce should also be linked appropriately with core business activities, and success potential should be supported by developing a set of e-commerce competencies related to factors like innovation, finance, productivity, human resource management and quality (Fillis, Johansson & Wagner 2003, 337).

In the second round of expert interviews, the differences between SMEs and larger companies in terms of their position and the success potential in e-commerce markets were raised as one of the central themes. This is related to the strategic importance of understanding one's own position in the markets and seeing the world in the "right way", i.e. in line with the realities of the markets and external environment, and thus having a realistic starting point for the development of e-commerce activities in a SME (c.f. Coltman, Devinney & Midgley 2008).

In the interviews, the experts were asked about the future success potential of SMEs both in business-to-business commerce (B2B) and business-to-consumer commerce (B2C). Overall, the experts saw that B2B- and B2C-electronic commerce differ considerably from one another. Still, in both, the basic necessary success factors were considered to be:

- a good business idea and good product(s)
- understanding of the potential customers and how to reach them.

Overall, the success potential of SMEs was seen to be significant, especially in B2B-commerce, since it does not usually require as high marketing investments as B2C –commerce, it is more targeted and specified, and it is also more based on personal contacts and clear contracts between the trade parties. Accordingly,

the experts strongly believed that potentially the greatest growth potential of electronic commerce of SMEs will be in B2B-markets also in the future. B2B-markets were also considered to have a lot of niché opportunities, as long as the product(s) or service(s) of an enterprise provide(s) genuine added value. Electronic commerce was also seen to have a potentially easening effect on subcontracting activities of SMEs, as long as they are ready and able to adapt to the systems and operating practices of their clients. (c.f. Aalto et al. 2000; Ticoll, Lowy & Kalakota 1998; To & Ngai 2006). On the other hand, subcontracting was seen to have a negative effect on the flexibility of SMEs, and increase their dependency on certain clients and partners, which may involve risks, e.g. if the market situation unexpectedly negatively changes.

Despite the opportunities of B2B –commerce, it must be remembered that a large number of SMEs operates in B2C –markets. Still, the interviewed experts generally considered that larger enterprises and companies are in an especially strong position in mass-oriented consumer markets. Also in electronic commerce, large companies have more resources, and hence better abilities to build attractive sites, develop sophisticated and integrated e-commerce systems etc. Limited marketing resources were also seen as a factor that may considerably hinder the success potential of SMEs in mass consumer markets, where a reliable and well-known brand is one of the key success factors (e.g. Davis & Gunby 1999; Kotler 1999). Additionally, the benefits of large enterprises were seen to include economies of scale, and better chances to use expert help and invest in new experiments.

Nevertheless, the general view of the experts was that with a well-defined business concept and especially good products, SMEs can have success potential also in consumer-oriented electronic commerce. Important competitive weapons of SMEs were seen to be personalised service or otherwise extra good service quality. Also, it was seen that SMEs could try to develop their brands, e.g. by building attractive Internet shopping centres in cooperation with one another. The potential advantages of small enterprises were also seen to include flexibility, which often enables them to change quicker than larger enterprises. In consumer markets, overall, SMEs were considered to be in the strongest position in the sales of specialized products that are targeted to special segments.

In the interviews, the experts were also asked to name the critical success factors of SMEs in the future electronic commerce. Additionally, also to enable an interesting comparison, they were also asked to name the critical success factors of larger enterprises. According to the experts, the critical success factors of SMEs can be summarised as follows:

- Creative networking, cooperation and partnerships for a successful place in value networks.
- Clearly defined business and clear electronic commerce strategies.
- Understanding of strategic objectives and the role of e-commerce in the overall business concept.
- Clear business focus, clearly defined market areas and customer segments.
- Understanding of customers to create added value, customer relationship management.

- Qualified and skilled personnel.
- Sufficient support to crucial e-commerce processes, especially when volumes increase.
- Reliable, well-functioning and cost-effective logistics.
- Innovativeness, visionary business view, ability to react to changes in the environment.
- Creative marketing, brand building, participation in right electronic marketplaces.
- Technologically sufficiently advanced systems, high level of information security.
- Cost-effectiveness, ability to manage the different risks of e-commerce.

In the case of large companies, the critical success factors turned out to be weighted differently than in the case of SMEs. First, for large companies, the role of formal strategy work and visioning, and especially also the ability to implement the strategies was highly emphasised (c.f. Hamel 2002; Tuunainen 1999). For them, a crucial factor was also seen to be the understanding of the role of electronic commerce in the overall business concept. Also, the importance of issues like change management, flexibility, continuous learning and changes in attitudes were highlighted. Like smaller enterprises, larger enterprises were also expected to invest in networking and partnerships. Continuous efforts to build and maintain a strong brand and positive market image were also considered very important for large companies. Not surprisingly, very important factors were also seen to be customer service and customer relationship management. Efficient processes, cost-effective operations and the integration of business systems and processes were also emphasised even more in the case of large companies than small enterprises. Further critical success factors for large companies were seen to be logistics and good distribution systems, as well as skilled and qualified personnel in general, support from the management, and investments in the development of e-commerce activities. International contacts and networking were also mentioned as remarkable opportunities, partly also necessities, and they were also considered to require special skills and knowledge.

To conclude, according to the interviewed experts, many of the critical success factors of both SMEs and larger enterprises turned out to be similar, but there were certain important differences in the relative weighing of the factors. A significant finding was that the need for strategic cooperation and networking was emphasised especially in the case of SMEs. Related to this, several experts also saw the need for the use of portals and centralized shopping sites to be higher for SMEs than larger enterprises. In the case of SMEs, a highlighted point was also the need for a clear business focus. Competition with larger enterprises was also seen to require a high level of specialised information, flexibility and a good ability to react to changes.

Although electronic commerce was commonly seen to open new opportunities to SMEs, traditional large enterprises with ready-established markets, a well-known and reliable brand and existing customer base were seen to have the highest success potential especially in mass consumer markets. A very important success factor in e-commerce was also expressed to be is also

logistics, where large companies can typically take advantage of high volumes and economies of scale, which may lead to such levels of cost-effectiveness that are difficult to achieve by SMEs. Especially in the case of standard products, it was commonly expected that large companies can operate with lower unit costs and thus successfully compete on price. For a part of SMEs, potential problems were also seen to be caused by potential changes in value chains, since if customers increasingly start to trade directly with producers or wholesalers, a number of traditional SMEs in retail sector may lose their role and market position (c.f. Benjamin & Wigand 1995; To & Ngai 2006).

Despite the described findings, on the other hand, it was emphasised in the interviews that the overall picture of the future electronic commerce markets is not clear or unambiguous. The markets are constantly evolving, and although the likely main trend in mass markets was expected to be centralisation, there were also expectations of simultaneously increasing diversity. Overall, the interviewed experts anticipated that the electronic commerce markets will never be completely stabilized, and also in the future the market power of large companies will be restricted by the fear of brave and innovative smaller competitors. Consequently, a part of the interviewed experts saw that the likely future picture of e-commerce markets may in fact be increasingly scattered and fragmented. In any case, it was believed that there will be room for competitive SMEs that challenge large companies and existing market structures. In the end, the market potential for SMEs was thus seen quite positive, as long as they can find suitable market segments and successfully redefine their roles in developing value networks. This optimistic view can also be backed up by encouraging research results showing that as long as SMEs are able to fashion their e-commerce activities to support their overall strategies, e-commerce may significantly contribute to sales growth and profitability (e.g. Karagozoglu & Lindell 2004).

5.3.1 Outsourcing and networking as potential opportunities

Outsourcing, i.e. the process of externalizing tasks and services that were earlier performed in-house to outside vendors, is not a new idea in business (Jenster & Pedersen 2000, 147). Still, electronic commerce has been argued to have a potentially radical impact on the extent and character of it. Due to scarce resources, many small enterprises have little resources to maximise value-adding processes in e-commerce, and therefore they have been seen likely to outsource non-core activities (Chaston 2004, 134-135). Also from the viewpoint of qualifications, SMEs have often been found not to have sufficient level of technical or other qualifications to build and maintain their e-commerce systems themselves. Networking and outsourcing may provide potential solutions also to this problem as long as appropriate and affordable services are available from external sources (c.f. Stockdale & Standing 2006).

On the second round of interviews, the experts were asked to express detailed ideas of how to promote and support the networking of SMEs, and how they could find suitable cooperative partners. Also in this context, the

interviewed experts emphasised the ability to understand own needs and future objectives, and to clearly define own strengths and development areas in each SME. Anyway, they raised networking and new cooperative models as one of the most important competitive weapons of SMEs in electronic commerce (c.f. Berg et al 1999; Evans & Wurster 1999; Mäkelin 1998). The common view of the experts was that SMEs should concentrate on their core competencies and outsource a substantial part of other activities (c.f. Hamel & Prahalad 1990; Hamel 2002; Jenster & Pedersen 2000). Then, a challenging task of each SME is to analyse from its own perspective, what kinds of cooperative partners and service suppliers are needed and wanted, and what is expected from these partners.

It was stressed in the ideas of the interviewees that SMEs should be prepared to the fact that networking is a long-term process, which needs resources. The interviewed experts also pointed out that SMEs, if possible, should have a person that concentrates on the development of networks and partner relations. However, especially in the case of small enterprises, the recruitment of this kind of special person was seen to be typically impossible, and it was suggested that these enterprises should attempt to find other ways to network. One option that was commonly suggested was to join and take advantage of existing networks, cooperative bodies, support organisations and institutions, and also to actively participate in relevant seminars, meetings, workshops, conferences, other forums etc. Generally, the interviewed experts believed that in Finland there are already a large number of beneficial instances that can help enterprises in their networking efforts. On the other hand, networking can also be supported by the use of the Internet and information networks, and different network portals etc. can also be used to support the networking activities of SMEs.

In the interviews, there was also a lot of talk about the different models and forms of cooperation and networking. According to a basic division, networks can be either horizontal and equality-based by nature, or alternatively they can be built around one strong actor that collects the other members around itself (e.g. Castells 1996; Ticoll, Lowy & Kalakota 1998). In fact, it has been seen that, in spite of having their own independent networks, SMEs have often tended to connect to networks that are led by larger enterprises or companies (e.g. Riggins & Mukhopadhyay 1994). A large number of SMEs also act as subcontractors in these kinds of networks, which may also increase their pressure to develop those kinds of e-commerce systems that are often demanded also by their clients. In the interviews, it was emphasised that already before making networking decisions, SMEs should carefully consider what kind of position and identity they would like to have in potential cooperation. Very important factors to remember in the building of networks were also seen to include mutual trust, mutual information management, making of clear and common rules and principles already in the building phase of a network, as well as clear decisions on the roles and expectations of each network member.

The interviewed experts emphasised that reasonable outsourcing of e-commerce activities can usually be beneficial for SMEs. Outsourcing is widely considered as a useful way to provide immediate skills and processes needed in e-commerce development with relatively small investments of time, money and training (European Union 2002, 19). Outsourcing can thus be seen as a factor that lowers the threshold of SMEs to start their electronic commerce activities. Related to outsourcing, it has been found that the use of application service providers (ASP) has been adopted rapidly in the Nordic region as a model to try to solve the problems caused by the shortage of own qualifications and skills in SMEs (European Union 2002, 20; c.f. Tinnilä et al. 2008, 118). Based on this finding, the use of ASPs by SMEs was also included as one of the discussion topics in the second round of my interviews. The aim was to collect ideas on how the interaction between SMEs and service providers could be improved so that the needs and expectations of SMEs could be understood and fulfilled in the best possible way.

Here, first of all, the interviewed experts emphasised that SMEs should keep the decision making of service providers sufficiently in their own hands, and decide what, from where, and at what price to acquire based on their own individual needs. It was also considered important to collect as good background information as possible about potential service providers, since the experts felt that the picture given e.g. in their marketing materials did not always reflect the reality. On the other hand, service providers were expected to reserve enough time for discussions, mapping of needs, and evaluation of different alternatives to serve the needs of SMEs. Service providers were also hoped to give good demonstrations, illustrations etc. to potential client SMEs, and to clearly demonstrate the benefits and potential restrictions or weaknesses of the solutions that they offer. An important factor which was also emphasized in the interviews was that service providers should express themselves clearly and speak a common language with SMEs, so that they understand one another.

In the interviews, it was also expressed that in practice, it is not a rare situation that a potential client SME does not know a lot about the technical solutions of electronic commerce, whereas the understanding of its own business is at a high level. Therefore, it was seen crucial that service providers and SMEs should have sufficient interaction, and service providers should be interested in the industry, business and its special features when planning and implementing e-commerce solutions. In the expert interviews, at a minimum level this was seen to require a basic understanding of the business logic and industry of a client SME. Overall, a central development need for service providers was seen to be a deeper understanding of the enterprise specific needs. On the other hand, the experts also wished that client SMEs would have some technical understanding to assess the provided services at a basic level. Still, if technical knowledge cannot be found or developed within a SME, a proposed option is also to ask help from external experts. Further, it was emphasised that from the viewpoint of SMEs, a very important factor to take

into consideration is the economic solidity of service providers and the continuity of services in any situation.

A negative view of the experts, unfortunately, was that in electronic commerce it is still easier to sell non-relevant solutions to SMEs than in many more traditional areas of business. Many enterprises were seen to lack necessary understanding of their own needs, and to be satisfied with non-optimal solutions that may be marketed and sold aggressively. The experts also criticised the majority of e-commerce systems to be too technically-oriented, although certain development to a more customer-oriented direction was also seen. The typically scarce development budgets of SMEs were also found as a problematic fact leading to a gap between the expectations and the realised solutions. Unfortunately, limited money often does not enable tailored solutions, but the standard solutions may not necessarily fit the particular needs of an enterprise.

According to the interviewed experts, the limited budgets of SMEs also caused that many service providers were not investing in SME-targeted solutions, although there could be a high demand for them. The lack of monetary and other resources in SMEs was also seen to have a negative impact on the overall interaction between service providers and SMEs. The ideas of how to develop this interaction were relatively scarce, concentrating on the development of general business communication practices, like regular contacts, flow of information between partners, discussions about special needs and expectations etc. Service providers were also wished to have increasing cooperation with one another, to network and reasonably share the different tasks. The cooperation of service providers was also seen as a potentially important source of new ideas for innovative solutions not only in IT, but also e.g. in the challenging questions of logistics. As an idea, it was also suggested that a network could be built, where SMEs, service providers and relevant neutral development parties could discuss and share their ideas and opinions of e-commerce related development needs (c.f. Lawson et al. 2003, 273). This is also in line with the findings of Stockdale & Standing (2006) that SMEs may have problems in finding reliable and effective service providers, and e.g. a benchmarking system could be developed to help the situation.

5.4 Specific development challenges of different enterprises

At a general level, it can be argued that the success potential in electronic commerce is in the end to a large part based on similar basic principles and ideas as in traditional commerce. The views of the interviewed experts supported the idea that in order to have a long term success in e-commerce markets, an enterprise should have a clear earnings logic and a business concept providing added value to its customers (c.f. Hamel 2002; Tuunainen 1999). Thus, electronic commerce activities have to be based on a clear business

idea, enterprises have to be able to reach the right customers, to successfully manage their customer relationships etc. It has also been noted that the success in B-to-C markets usually sets even higher challenges to SMEs than the success in B-to-B markets (e.g. Aalto et al. 2000). There are also notable differences between industries and product groups, and they have their own special requirements and critical success factors.

Recently, the development of electronic commerce has been an important area of strategic business development in many traditional enterprises. A number of new innovative enterprises has also entered the markets, and challenged and partly forced traditional enterprises to rethink their business concepts. In the development of electronic commerce, there are a number of interconnected questions to take into account, and enterprises should define the role of electronic commerce in the overall business, remembering their own background and business objectives. Nevertheless, this is often very demanding, and it is also problematised by rapidly changing situations in the markets, developing technologies, uncertainty of the environment etc. Additionally, even the finest strategic plans are virtually useless unless they are implemented successfully. An important point to remember in the development activities is also a sufficiently human and customer-oriented development approach, and avoidance of the excessive domination of purely technical issues (c.f. Tuunainen 1999). In any case, success in the changing environment of electronic commerce requires ability to understand emerging opportunities and to develop core business areas so that the demands of customers are fulfilled or even exceeded (e.g. Hamel & Prahalad 1990; Kodama 1999).

Small enterprises vs. large companies

For an enterprise, the start and development of electronic commerce is typically a demanding process with many questions to be answered (e.g. Aalto et al. 2000). A central question from the viewpoint of SMEs is how to position in electronic commerce markets with larger rivals. As pointed out earlier, SMEs typically have smaller economic resources, more limited knowledge and qualification base etc. than large enterprises. Also, investment opportunities of SMEs are typically more limited, and the investments have consequently often been dependent on the potential public support available for this purpose. Nevertheless, the development of successful electronic commerce activities is typically a long-term process, where the expected payback time of investments can be quite long. Still, also according to the interviewed experts, SMEs should take the development of e-commerce seriously, since there is otherwise a growing risk that they will lose their potential as respectable business partners in the future. A number of the interviewed experts also expressed that there were already signals that e-commerce and other business activities converge and form increasingly integrated entities, as a result of which e-commerce will be increasingly like a normal part of "business as usual".

As the question of the position of SMEs and large companies was considered very significant from the viewpoint of the future development

prospects, the interviewed experts were asked about their ideas of the positive and negative factors of both these groups in the future electronic markets. Table 7 summarises the main results of the interviews in terms of this question.

TABLE 7 Positive and negative factors of SMEs and large companies in the future electronic commerce markets

SMEs	Large companies
+ specialisation opportunities, success potential in chosen focused market segments	+ economies of scale
+ opportunities of networking and cooperation	+ budgetary and other resources enabling well-developed business systems and solutions
+ flexibility, ability to react quickly to changes	+ well-known brands that support success
+ deep knowledge and expertise of own industry and markets	+ relatively large marketing resources
+ knowledge of customers, ability to build personal service concepts	+ possibility to recruit specialised personnel
+ different kinds of project funding available for development support	+ financial potential to use high-class experts, do innovative experiments etc.
– relatively scarce resources for long-term investments, limited ability to take risks	– potential inflexibility and inability to adapt quickly to changing market situations
– relatively small marketing resources, problems to get acquainted and trusted in the markets	– potential conflicts between business channels
– limitations in personnel and time resources, qualifications, knowledge and skills base	– problems in the integration of different parts of the business
– limited opportunities to use specialised expert services, training services etc.	– problems in defining e-commerce strategy or the role of e-commerce in the overall strategy
– small possibilities to influence on own environment	– general management challenges of large entities
– potential dependency on large companies	

As Table 7 shows, at a general level, on the positive side SMEs can take advantage of specialisation opportunities and a clear focus, networking and cooperation opportunities, flexibility and ability to react quickly to changes, a high understanding of their own industry and markets, knowledge of customers and ability to build personal service concepts. Additionally, opportunities to participate in specially-funded projects were also seen as an opportunity for them. In the competition with larger enterprises and companies, SMEs should be able to take advantage of these strengths, and try to eliminate the problems that are caused by their negative characteristics in comparison to their larger rivals.

Related to the found negative factors of SMEs, in the second round of interviews, the representatives of enterprises were also asked about the biggest "bottlenecks" that they had experienced in the development of their e-commerce activities. Since the interviewed enterprises were small, it was not

surprising that central bottlenecks were seen to be economic and human resources, as it had been noticed that the development of e-commerce systems may require substantial amounts of both time and money. Perhaps, in terms of e-commerce, many of these enterprises have certain characteristics of so called "toe dippers", which have been found as a substantial group of SMEs and have basic computer needs but limited skills in using them. Typically, this kind of enterprises are unwilling to expand their e-commerce resources and do not have intention to progress from basic to any further e-commerce development levels. Usually, they also have little ambition to grow beyond their current size and they tend to see IT services overpriced and inefficient. (c.f. Stockdale & Standing 2006)

In many cases, enterprises do not have own know-how to plan and implement their electronic commerce solutions, but on the other hand the work of outside experts is considered expensive. A part of the interviewed, "traditional" enterprises therefore even had doubts, whether they could have invested in electronic commerce to the extent that they had, unless they got some special development support from projects. Technical solutions were seen by the interviewees as especially demanding fields of expertise, as well as the understanding of the entity of electronic commerce processes. The finding of "a common language" with IT system providers was also considered as a problem. Other problematic areas were seen to be the choice of appropriate marketing channels, logistics and legislative questions. The development of the behaviour and computing skills of customers were also seen as essentially important factors that determine the future success.

Electronic commerce start-ups vs. traditional enterprises

In electronic commerce, there is a group of new, often growth-oriented and offensive start-up enterprises that have started their operations directly from web-based solutions. Usually, they have built the whole business concept and strategies only for electronic commerce. On the other hand, there is another, larger group of traditional "bricks-and-mortal" enterprises that have done retail business in physical outlets and have (voluntarily or sometimes less voluntarily) expanded their activities to e-commerce. In these enterprises, the role of e-commerce is often mainly complementary or supportive to traditional business, and often the position of these enterprises in electronic markets can be called defensive. Among the e-commerce strategies categorised in the literature, the suitable options for the brick-and-mortar SMEs include expansion of their customer base, leveraging their customer service, and improving their purchasing management. Nevertheless, these traditional enterprises may be heavily challenged by the offerings of new e-commerce start-ups.

Overall, the question of differences between electronic commerce start-ups and traditional enterprises is very interesting. Therefore, it was seen essential to include a comparative analysis of these groups also in this study. The analysis was included in the second round of expert interviews, and it resulted in a number of interesting discussions and valuable viewpoints. This enriched the analyses

of different strategic choices of SMEs in electronic commerce, and tackled one more dimension of factors that may cause considerable differences between SMEs.

The interviewed experts considered the critical success factors of electronic commerce to be somewhat different for e-commerce start-ups and for enterprises with a longer tradition. An important explaining factor here is brand: a start-up enterprise does not usually have a well-established brand or established customer or knowledge base, and thereby a big challenge for start-ups is to make themselves known and trusted in the markets. Especially in the mass consumer markets, this was seen to be difficult and expensive, and to require potentially massive marketing activities. Related to this, the interviewed experts raised a realistic understanding of e-commerce development and marketing costs and a strong financial structure high in the list of important success factors of start-ups. In addition to marketing, many other costly investments are needed, and entrepreneurs/managers should have a clear picture of the cost and income structures. Overall, for start-ups, the achievement of a sufficient market share and profit was seen far from self-clear. A common view of the experts was that to improve success potential, e-commerce start-ups should either have an especially good innovation, or otherwise be able to provide customers with some exceptional added value. From the very start, important factors were also considered to be reliable and cost-effective logistics, as well as a successful management of the entire business concept with its different processes.

In the case of start-ups, there was also a lot of discussion about the future customer preferences. Commonly, the experts felt that most likely a large share of customers wants to have personal human service and interaction in a majority of commercial transactions also in the future. Actually, this has partly also led to a phenomenon, where many e-commerce start-up enterprises also want presence in more conventional markets to support their e-activities (c.f. Hyvönen & Pylvänäinen 1999, 17-19). E.g., in the United States, a growing number of enterprises that started as pure e-commerce start-ups have established physical outlets to support the building of reliable image and brands. Overall, the interviewed experts saw that e-commerce start-ups would have the highest success potential in the production and sales of digital products and services, and specialized products that are targeted to special groups and that cannot typically be found in most traditional shops. The experts also expected that there will be new start-ups that continuously try to develop new concepts and commercial breakthroughs by reforming the traditional value networks (c.f. Giaglis et al. 1999).

On the contrary to e-commerce start-ups, the interviewed experts emphasised that more traditional enterprises have business experience, relatively well-established brands, ready-built customer relationships, partnership etc. as their typical relative strengths (e.g. Davis & Gunby 1999). Enterprises that have been in the markets longer, usually have a better experience-based understanding of the business logic and successful business

practices in a certain market than electronic commerce start-ups. Based on experience, traditional enterprises were also seen to typically have a better understanding of their strengths and weaknesses than start-ups do, which increases their opportunities to benefit from the perceived strengths and prevent the negative impacts of the weaknesses (c.f. Davis & Gunby 1999). From the viewpoint of future success potential, the interviewed experts considered it extremely important that traditional enterprises take advantage of their strengths and utilise their long-term information of customers. The basic view was that the mass markets of the future will be mainly dominated by large companies that operate both in traditional markets and electronic commerce markets. Still, it was seen necessary that traditional enterprises critically assess and continually develop their activities and services to remain competitive. Anyway, the experts strongly believed that if traditional enterprises understand the opportunities of electronic markets and successfully renew their structures and operations according to new demands, they have substantial success potential.

The comments of the interviewed experts were strongly supporting the idea that as electronic commerce increases, most traditional organisations are forced to rethink and redefine their business processes and to go through changes both in their thinking patterns, business tools and work processes (e.g. Evans & Wurster 1999). On the other hand, the interviewed experts also highly emphasized that each enterprise should assess the needs and wants of electronic commerce development particularly from its own perspective. Consequently, e-commerce solutions should be based on the core competencies of each enterprise and take advantage of its traditional success factors.

In practice, electronic commerce development activities in traditional enterprises were usually seen to start by short and careful steps that support the traditional business processes, which the experts largely considered sensible. Also, in the interviews of the enterprises which had expanded their activities from traditional markets to electronic markets, an approach where e-commerce is seen as an instrument that supports traditional business instead of purely being a business of its own was clearly visible. Still, a part of the interviewed experts estimated that a too high share of small Finnish enterprises automatically decides to stick only to the stage of passive Internet presence in their solutions (c.f. Poon & Swatman 1999), without thinking of what a deeper commitment to e-commerce could potentially provide. Still, a great challenge is that also those enterprises that see electronic commerce mainly as an opportunity rather than a threat may feel that their traditional business systems, qualifications, knowledge and skills are not valid in the new electronic environment (c.f. Aalto et al. 2000, 16). Overall, especially the interviewed experts emphasised that for a successful development of e-commerce activities, long-term commitment from the whole organization would be needed (c.f. Kalakota & Robinson 1999). However, it was seen that especially in small traditional enterprises, the development activities may in practice often be seen

only as a separate part-time project implemented on the side of all other work tasks.

As a potential problem of traditional enterprises, the interviewed experts commonly mentioned the management of business channels and their potential conflicts. At the same time when traditional enterprises enter electronic markets, they should typically also safeguard the success of their traditional outlets. Especially if e-commerce activities are started as a separate business unit with own objectives and targets, there is a risk that the channels end up competing and "cannibalising" one another (c.f. Evans & Wurster 1999). If e-commerce competes with traditional channels, it is also natural that the traditional sales personnel of an enterprise may become worried about its future. To avoid these situations, in the expert interviews it was seen important that these questions should be taken seriously, and different channels should be integrated so that they can support one another in a complementary way (c.f. Tuunainen 1999; Van Diepen 1999). Anyway, it was anticipated by several interviewed experts that the decision between different channels and their business roles is going to be a difficult strategic choice for many enterprises (c.f. Evans & Wurster 1999). So far, the role of most traditional outlets has not been threatened by electronic commerce in most enterprises, but as consumer behaviour and shopping habits change, it is likely that this risk may increase.

Generally, the interviewed experts considered the integration of electronic commerce systems to the other business systems and processes very important from the viewpoint of future competitiveness (c.f. Kalakota & Robinson 1999, Poon & Swatman 1999; Van Diepen 1999). Some experts even saw it as the most crucial factor that determines the success potential in the future network economy. By integrating business systems and functions reasonably together, enterprises were seen to achieve cost savings, to improve their ability to give good and flexible customer service, as well as to improve information flow both within an enterprise and between an enterprise and its external interest groups (e.g. Doukidis et al. 1998). However, it was also pointed out that the costs of integration can be substantial, and a careful evaluation of costs and benefits was recommended, especially in the case of small enterprises. The interviewed experts also felt that there are remarkable differences between electronic commerce start-ups and more traditional enterprises in how the integration process should usually proceed. For electronic commerce start-ups it was considered to often be even a benefit that they can start without "historical burden" and old systems. If start-ups quickly succeed in developing an integrated system that is clearly more advanced than the ones of more traditional competitors, the experts saw this as a potentially significant source of competitive advantage. Especially for the start-ups that are starting to build their brands, it was also seen essential that they build reliable business processes and systems from the beginning, since the consequences of mistakes and the following bad reputation could be disasterous.

6 RESULTS OF THE ANALYSES OF QUALIFICATION REQUIREMENTS

As illustrated earlier, electronic commerce can have multidimensional impacts on the strategies and operations of enterprises, as well as competition and market situations. Consequently, the development of electronic commerce also raises increasing demand for new, even distinctive, qualifications and competencies, knowledge and skills (c.f. Da Silveira 2003).

The main objective of this study is to analyse the qualification requirements of electronic commerce especially from the viewpoint of SMEs. The study also attempts to provide ideas and information of how the required multidimensional qualifications could be acquired and developed. This study is motivated by a threat that unless sufficient attention is paid on the development of these issues, there is a growing risk of quantitative and qualitative imbalance in the demand and supply of e-commerce related qualifications in Finnish SMEs. In the worst case, this can hamper the growth, competitiveness and employment prospects of the Finnish and European enterprises and the overall economy. (c.f. European Union 2002, 23).

This chapter forms a central part of this research, and concentrates on the reporting of the results of the analyses of qualification requirements of SMEs in electronic commerce. Although the emphasis is at the level of enterprises as entities, the chapter still starts from an analysis at the level of individuals, which is the traditional level of most analyses of qualification requirements. Nevertheless, in this study, the role of this analysis is more like an introduction to the following analyses, which concentrate on the main topic, i.e. the qualification requirements at the level of enterprises as entities.

6.1 Changing qualification requirements of individuals

In the research of qualifications and qualification requirements, the emphasis has traditionally been on individuals. Also electronic commerce can be expected

to affect the content and organization of work of individuals in SMEs and other organisations. In dynamic environment, it can also be expected that individuals will be increasingly challenged to learn and develop themselves continuously, and to update their qualifications, knowledge and skills both by formal and informal education & training activities (e.g. Mosley & Hurley 1999; Ruohotie 1996; Varila 1992). Also, it seems that changing work processes, often increasingly mutual responsibilities and team-based work structures will further emphasise the need of individuals to understand "the big picture" to fulfil her or his role as a part of a successful business entity.

Based on the results of the conducted research process, this paragraph analyses and discusses the challenges of e-commerce related qualification requirements from the viewpoint of individuals.

Electronic commerce and the work of individuals

As an important background for the analysis of qualification requirements of individuals, in the first round of expert interviews, there was a question about the impacts that electronic commerce may have on the future labour markets in commercial sector. Here, an attempt was to collect ideas of both qualitative and quantitative changes related to the nature of work, work profiles, professions, wages etc.

A general view of the interviewed experts was that especially in the long run, the work structures of commerce may be changing considerably. If commercial transactions turn more and more to electronic form, it will have reflections on labour markets and professions, and can lead both to opportunities and change pressures for individuals. Still, this process was seen as gradual, and the short-term impacts of e-commerce were not anticipated to be so dramatic.

Both according to the interviewed experts and existing literature, a remarkable phenomenon related to the development of e-commerce is shortening of value chains and a diminishing amount of intermediaries (e.g. Aalto et al. 2000; Benjamin & Wigand 1995; Kettunen & Filenius 1998; To & Ngai 2006). In commercial sector, organisations have traditionally aimed to increase the productivity of work and increase the amount of self-service (Itkonen 1996). In the interviews, the development of electronic commerce was anticipated to have similar kinds of effects. Still, the interviewed experts did not see e.g. wholesalers to completely lose their role, although the role may be changing. Nevertheless, the experts considered wholesalers with effective buying processes and sophisticated logistics systems to have success potential also in the future. On the other hand, the interviewees simultaneously pointed out that a growing number of especially digital products will be traded without the need for wholesalers.

Overall, the experts considered it very difficult to anticipate what potential quantitative impacts the development of electronic commerce will have on the workforce in commercial sector. On the other hand, e-commerce can increase the productivity of work and drop some trade parties or work processes out of

the future value chains, which may result in a decreasing need of labour force. Also, it was anticipated that in e-commerce there will not be as much need for traditional product placement activities or cashiers as in traditional commerce. Hence, the emphasis of operational work was seen to switch more into the direction of collecting and packing of products and taking care of effective logistics. Overall, jobs in product delivery were anticipated to increase, but mainly in specialised distribution companies or enterprises. Anyway, a part of traditional jobs were seen to be threatened, but it was also anticipated that a part of persons could be retrained and transferred to other tasks.

On the other hand, electronic commerce was also anticipated to create new jobs, but increasingly in new kinds of processes. A remarkable part of these jobs were seen to require high-level qualifications, including the ability to understand and manage complex entities. Thus, the net quantitative effects of electronic commerce on the future labour needs in commercial sector were seen very challenging to anticipate, but the nature of a part of commercial jobs was seen to change remarkably.

All in all, the interviewed experts anticipated the change in the labour force of commercial sector to be more task-structure-based and qualitative than quantitative. The qualitative change was seen as a natural part of structural change and technological development brought by e-commerce, which requires the development of qualifications, learning of new skills, and professional reorientation of individuals. Hereby, electronic commerce was seen to follow a pattern, where technological development has been found to simultaneously create new kinds of jobs and lead to a decrease in traditional jobs. This phenomenon can also be considered to be in line with the Schumpeter's classical idea of creative destruction that is driven by innovativeness and entrepreneurship (c.f. Kyrö 1997, 120-121). Also in SMEs, this may lead to a potential mismatch of qualifications and a potential shortage of labour force with right qualifications. This should be avoided both by guaranteeing that new employees are provided with the right qualifications, but also by taking measures to reorientate and retrain the existing staff to meet the new demands.

A challenge for the commercial sector is to get old personnel motivated to continuous professional development and to adapt their qualifications to the new demands and cope with the challenges of the changing environment. Also the interviewed experts were generally more worried about the quality than the quantity of the future labour force in electronic commerce. To respond to this challenge, support from the public sector and the development of educational & training practices were seen as key factors. A number of the interviewed experts also suggested that entrepreneurs and managers should be given training to understand e-commerce (and e-business in wider meaning), but at the same time they were worried about how to get qualified teachers and trainers who would be committed to this work.

The interviewed experts were also asked to anticipate what kind of labour force they see to be most scarce in the future. The experts saw the biggest shortage to be of top-qualified information technology (IT) experts, but

especially also of persons who are qualified and skilled both in IT and business, and are able to combine the qualifications of these areas. This is in line with the previous research results (e.g. High Tech Workforce Resource Center 1998), where a need to combine technical skills, content/business understanding and good client-facing skills has been emphasised.

In terms of wage development, the experts anticipated two-sided development, which could increase the gap between professional wage groups (c.f. Tynjälä 2003). In highly demanding technical and strategic positions, the wages were expected to increase, and also the profit-based payment systems were expected to be emphasised. In routine-like operational posts, in turn, the wages were expected to even decrease, and it was anticipated that e.g. packing, distribution etc. would be tasks where low wage jobs would be increasingly created. It was also anticipated that it may not be easy to find enough Finnish employees to these tasks, and potentially they will be increasingly carried out by foreign labour. In addition, part-time work, shift-based work and different kinds of short-term jobs were anticipated to further increase in commerce, and temporary long-term contracts were expected to be growingly replaced by labour subcontracting or temporary work force.

To summarise, in the conducted expert interviews, the most significant impacts of electronic commerce on the work force in commercial sector were seen to be the following:

- In quantitative terms, the net impact remains an open question, since there will be both increases and decreases depending on the task and profession.
- In qualitative terms, professions, tasks and required qualifications will probably change significantly. Jobs in a number of traditional posts and professions will decrease, and an increasing share of work will be in new tasks and processes.
- There will be a growing need for highly-qualified professionals and also persons in certain routine tasks (packing etc.), whilst the number of e.g. traditional cashiers was anticipated to decrease.
- In terms of supply and demand, top professionals and persons able to combine the understanding of business and IT were seen as the scarcest resource.
- To avoid the threat of structural unemployment, professional development should be motivated and supported by suitable educational and training measures.

All the above findings should also be considered in SMEs to understand what potential impacts they might have on their personnel and to plan e.g. training activities, other kinds of qualification development etc. proactively to avoid potential mismatches of the existing and needed personnel and its qualifications.

Qualification requirements of individuals

Next, in the analyses at the level of individuals, the emphasis was turned to the question of what kinds of qualifications are expected from the future personnel recruited to e-commerce activities. This question is highly important also from the viewpoint of educational and training development, and it was asked from the experts during the first round of interviews.

The results were interesting, although not very surprising, since they strongly emphasised a number of overprofessional qualifications. According to the expert interviews, the most commonly expected qualifications from the future e-commerce personnel can be listed as:

- creativity, innovativeness, open-minded attitude
- customer orientation
- ability to operate also in international markets
- systematic thinking, ability to manage complex entities
- flexibility, cooperativeness, team working skills
- communication skills, interaction skills
- sufficient practical experience of business
- commitment and conscientious work

The results support the idea that in modern working life general, overprofessional qualifications are often seen even more important prerequisites of a certain job than very job-specific business-technical qualifications (c.f. Rauhala 1993, 25; Ruohotie 2002). The results can be argued to emphasise the importance of cross-functional qualifications and flexibility, which reflects the development of new kinds of professions that are not narrowly divided but adaptive by nature (Rauhala 1993, 19-20; c.f. Ruohotie & Honka 2003). Generally, the development of electronic commerce was also seen in the interviews to increase the demand for individuals with creativity and higher-level conceptual skills to enable enterprises to harness electronic commerce to produce high economic value. (c.f. European Union 2002, 23). In addition, the emphasised qualifications included openness, learning ability and innovativeness, which can also be seen as resources of further learning and development in the future (c.f. Väärälä 1998, 24). What is noteworthy in the results is also that the need for multiple qualifications was highlighted. Especially an ability to combine business knowledge and technological knowledge was here again seen to be of great value. The experts also considered formal education, degrees etc. as valuable verifications of a certain level of background knowledge. An interesting finding based on the results is also that the expectations for e-commerce employees can be actually considered to be quite similar to the characteristics that are typically connected to successful entrepreneurs. This supports the idea that employers would like their employees to act more and more like intrapreneurs (c.f. Koiranen & Ruohotie 2001).

Although persons in an enterprise continue to work as individuals also in the future, in the expert interviews, the emphasis of the qualification requirements of individuals was seen to shift increasingly to a collective direction. The changing nature of work, e.g. increasingly process-based work, connects the activities of individuals growingly together in new border-breaking ways. Also in e-commerce, the processes and activities of enterprises, or wider enterprise networks, were expected to tie up qualifications of different professionals or professional groups. Therefore, it is justified to say that successful work processes increasingly require a good ability of individuals to

connect their own qualifications and competencies to a wider context and work of the organisation (c.f. Väärälä 1998, 24). From the viewpoint of enterprises, a challenge is to combine different kinds of qualifications and competencies and to integrate and/or divide work in a relevant way. The idea here is that by combining individual qualifications successfully as complementary parts of a strategy-based business logic, it is possible to reach the collective level of qualifications and competencies that can optimally support the success of an enterprise in e-commerce (c.f. Väärälä 1998, 25-26). The ideal would be a kind of 1+1>2 situation, where as a result of good organising, the collective level of qualifications in an enterprise would be higher than the sum of individual qualifications would be separately. To enable this, the role of management and leadership is crucial. Consequently, the new qualification requirements of managers include an understanding of organizational models and an ability to restructure organizations in a relevant way, as well as social qualifications and the ability to systematically manage complex and time-consuming development processes (c.f. Kanter 2001; Väärälä 1998).

To summarise, the basic results of the future qualification requirements of individuals in electronic commerce related tasks are in line with the main results of earlier research on qualification requirements in the modern work life (e.g. Metsämuuronen 1998; Rauhala 1993; Ruohotie 2002; Tynjälä 2003; Väärälä 1998). Nevertheless, the special characteristics of e-commerce pose certain special requirements both to individuals and SMEs, e.g. in the development of relevant processes and technical solutions for them. Still, according to the research results, an emphasised role in the future will be played by multiple overprofessional qualifications that have been found important also in a number of earlier researches. The changes in the nature and organization of work has also led to the shift of emphasis from the qualifications of individuals to the qualifications of teams, organizational entities and networks, and also the ability to combine individuals with different qualifications in a way that produces added value. In a quickly changing environment individuals have to continuously renew their knowledge and skill bases and seek for continuous professional growth (c.f. Nurminen 1993). This requires entrepreneurial attitude, which can benefit both individuals, existing enterprises and also the birth of new enterprises (c.f. Drucker 1985; Koiranen & Ruohotie 2001).

6.2 Qualification requirements of SMEs as entities

As described, the main emphasis in the analyses of qualification requirements in this study is at the level of enterprises as entities. This was a deliberate choice, which was carefully thought of at the planning phase of the research process. Also, this choice can be backed up by the argument that collective qualifications have increasingly often been seen even more crucial in the future

than the qualifications of individual persons (c.f. Metsämuuronen 1999; Ruohotie 2000).

A lot of attention was paid to the construction of a clear and understandable analytical framework for the analyses of qualification requirements. As described earlier, the decision was made to classify them under certain areas, which were based on the idea of functional work areas in electronic commerce. These areas and their subareas were used as the starting point in both quantitative and qualitative analyses. The chosen approach to qualification requirements is concrete and practical by nature, which was found as a relevant choice with respect to the objectives of this research, as well as the chosen data collecting method. The relevance of the choice was also backed up by the interviewees, who found the chosen function-based classification of qualifications understandable, adequate and interesting. Based on the experiences during the research process, it can also be argued that any more abstract approach would probably have resulted in weaker results, although it could have been justified from theoretical viewpoints. An advantage of the chosen approach is that it helped the interviewees to connect the qualifications meaningfully to the functions and activities that are important in normal everyday business. The interviewed experts, like the representatives of enterprises, also felt that the chosen set of qualifications formed a complementary and consistent combination of the necessary concrete qualifications and competence areas in electronic commerce.

For the purposes of the analyses, the qualifications were first classified into four main function-based areas that were based on the ideas of important functional areas in well-functioning electronic commerce, applied from the ideas illustrated in the literature. The classification was planned and constructed as a result of collective thinking by the researcher and a small number of experts that provided support in the construction of the research setting and interviewing questions. To enable also a more detailed level of analyses, the chosen main areas of qualifications were further divided into a number of subareas that were considered appropriate. Especially in the structuring of the qualification areas and their subareas, the ideas of cooperating experts were invaluable to the researcher. Finally, the overall structure of the chosen classification was tested by three test interviews. Since the results of these test interviews pleased both the researcher and the interviewees, the decision was made to continue with the tested classification. It could be also pointed out that during the actual interviewing process, none of the interviewees questioned the relevance of the classification.

In the chosen classification, the four main areas of qualifications were the following:

1. Marketing and customer relationship management
2. Strategic management and business process development
3. Technical solutions and logistics
4. Innovations and product development

Of the areas above, marketing and customer relationship management is an area of qualifications which has been seen extremely important in the future markets with international competition (e.g. Metsä-Tokela, Tulkki & Tuominen 1998, 225). These qualifications have been illustrated as important development areas also in earlier literature and research on electronic commerce (c.f. Tuunainen 1999).

Strategic management and business process development, in turn, are other kinds of key factors for a long-term success, and qualifications and competencies in this area are generally considered necessary for viable business also in e-commerce (e.g. Hamel 2002; Porter 1987, Porter 2001; Tuunainen 1999). Additionally, appropriate processes and also financial systems are naturally needed to support a successful business and its implementation.

A central qualification area in electronic commerce is also technical solutions, since the infrastructure of e-commerce is strongly based on and dependent on IT-based solutions and information networks (e.g. Kettunen & Filenius 1998). Technical solutions can thus be seen as important or even necessary background tools behind a successful business in e-commerce. In addition to information technology, also the reliability and efficiency of logistics, supply and delivery have been commonly argued to be among the significant competitive factors in electronic commerce, and consequently they were also regarded as an important area to include in the conducted analyses of qualification requirements (c.f. Ali-Yrkkö et al. 2001).

Further, innovativeness, creativity and continuous product and solution development can be seen as basic elements of successful e-commerce business operations and entrepreneurship in the changing environment. This may be even further emphasised in a rapidly developing area like electronic commerce. In general, the meaning of innovativeness as a source of competitive advantage only seems to increase in information society (e.g. Hamel 2002; Nonaka & Takeuchi 1995), and it can also therefore be considered as an interesting and relevant area to include in the analyses of the qualification requirements of SMEs in electronic commerce.

6.2.1 Analysis of the significance of the main areas of qualifications

Based on the chosen classification, information on the qualification requirements of electronic commerce in SMEs was started to collect by a two-stage interviewing process both with the chosen experts and the representatives of enterprises. As explained earlier, the used research method can be seen as an applied version of the Delphi technique.

The first round of interviews was planned to provide an overall picture of the development challenges related to electronic commerce and to collect important basic information of qualification requirements, which could then be deepened and widened in the second round. After the analysis of the results of the first interviewing round, the interviewees were provided with the results,

they were given a chance to comment, and the most important and interesting comments also affected the planning of the questions for the second round.

In both rounds, information on the future qualification requirements was asked both from the experts and from the representatives of enterprises, which also enabled interesting comparisons between these two groups. In both rounds, the analysis of qualification requirements started from the chosen four main areas of qualifications, after which the attention was targeted to the analysis of more specific and detailed subareas within these main areas. This procedure was found appropriate and challenging by the interviewees and it was experienced to produce a considerable amount of anticipatory information on the future qualification requirements in electronic commerce. The interviewees also expressed that the research process provided them with new ideas, and made them think of qualification requirements from new and systematic viewpoints, which also increased their motivation to concentrate on the questions. This can be considered also to have improved the quality and validity of the research results.

In the first round of interviews, by using a four-dimensional diagram, the interviewees were asked to assess, how significant they regard the chosen four main qualification areas from the viewpoint of SMEs in electronic commerce. The interviewees, i.e. the chosen Delphi group members were asked to approach the question so that the experts concentrated more on SMEs at a general level, whereas the representatives of the enterprises concentrated particularly on their own enterprises. To emphasise the anticipatory nature of the analysis, the interviewees were also asked to assess the significance of the different areas of qualifications separately in the short term (1 year) and the long term (5 years). The significance of each main area of qualifications was measured by a 5-point ordinal rating scale (5 = high significance -> 1 = low significance).

The diagrams presented in Figure 6 and Figure 7 illustrate the results of the analyses of the significance of each main area of qualifications in the short term and in the long term. The diagrams also enable the comparison of the results of interviewee groups (experts and representatives of enterprises). Also, the points representing the importance of each qualification area in the diagrams have been connected to form “diamonds”, the shape of which for its part also illustrates the weighting of the different qualification areas in the results of both interviewee groups. The presented indicator values (points) of each qualification area in the diagrams are the mean values of the scores of the interviewee groups. Other statistical information on the results can be found in Appendices 5 and 6. Figure 6 illustrates the results on the significance of the chosen main areas of qualifications in the short term.

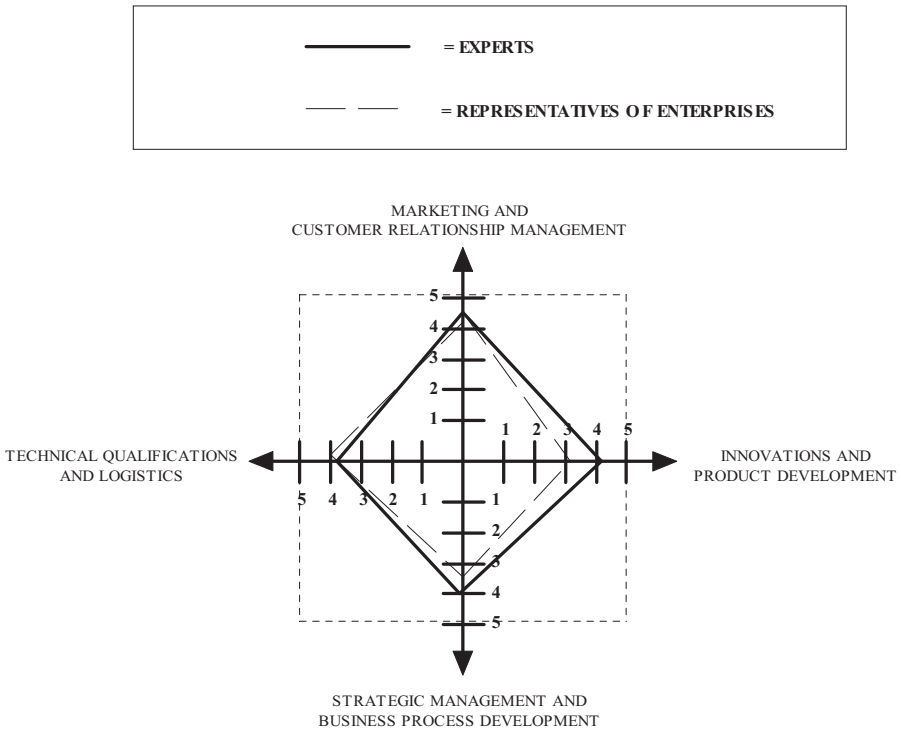

FIGURE 6 Results on the significance of main qualification areas (short term)

As Figure 6 indicates, both interviewee groups found all the chosen main qualification areas to be significant for SMEs in electronic commerce. Still, an interesting finding in the diagrams is also that there are certain differences between the results of the experts and the representatives of enterprises. It can be seen that the experts emphasized already in the short term the meaning of strategic processes and innovations more than the representatives of the enterprises, who, in turn, emphasized the meaning of marketing, sales and customer service above anything else.

Figure 7 illustrates the long term results of the conducted analysis. The results have been reported according to the same principles and presentation technique as in Figure 6.

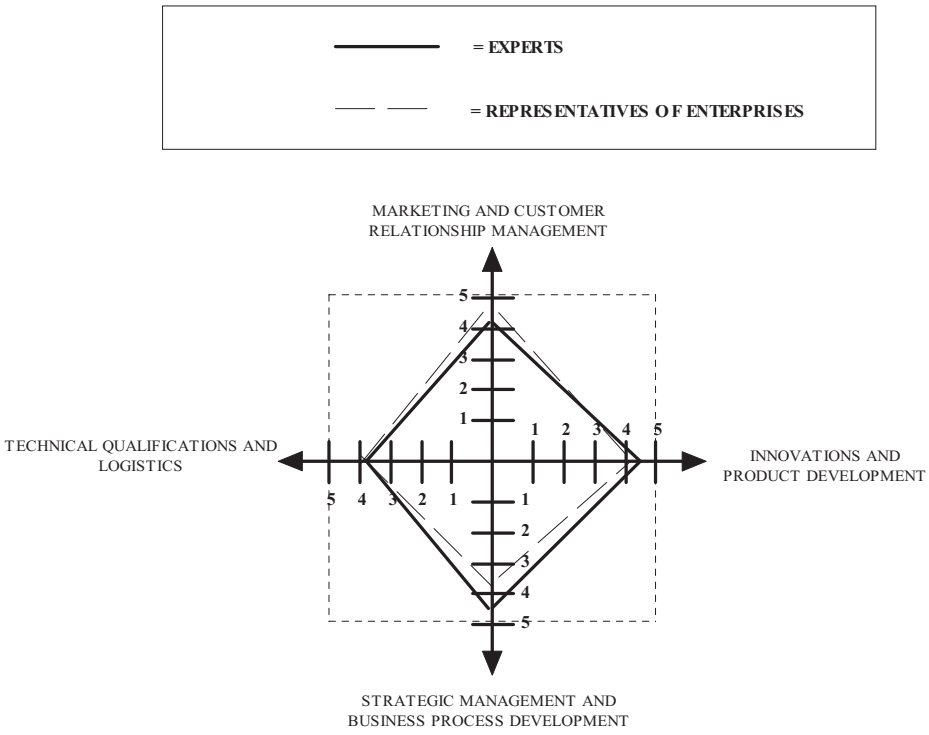

FIGURE 7 Results on the significance of main qualification areas (long term)

As Figure 7 indicates, also in the long term results, there are certain differences between the interviewee groups, i.e. the experts and the representatives of enterprises. Still, on the other hand, long-term diagrams of the groups do not differ that considerably from one another. The viewpoint of the experts is that the most significant qualification areas in the long term, above technical qualifications and logistics, are strategic management and business process development, innovations and product development, and also marketing and customer relationship management. In turn, the representatives of enterprises raised the significance of marketing and customer relationship management clearer above all the other areas in the long term analysis.

The diagrams show that all the presented qualification areas were found to be of significance also in the long run. Remarkable points in the results include a strong emphasis of the experts on the significance of strategic management and business process development, which is an area that the representatives of enterprises did not value as high in their answers. On the other hand, both groups agreed on the strong significance of marketing and customer relationship management, which illustrates that although the public discussion on electronic commerce may often concentrate mainly on technical issues, it is the business related qualifications that can be much more important from the viewpoint of success. In the conducted analysis, technical

qualifications were regarded significant, but they were not raised above the other areas. Several comments of the interviewees during the data gathering also suggested that technical issues were not seen as the main thing, but rather as a tool or platform that provides solutions for the development of e-commerce business.

Overall, in the end, the differences in the significance of the four main qualification areas turned out to be relatively small in the results of the analysis. Consequently, perhaps the main interpretation of the results is that both the experts and the representatives of enterprises emphasised that successful electronic commerce in SMEs requires a combination of versatile and multifaceted areas of qualifications. It was also mentioned by many interviewees that the different areas of qualifications can, and even should, be seen complementary and supportive to one another. This is in line with the earlier presented idea of the need to combine different kinds of skills to manage different functions and complex entities in electronic commerce. The results can also be argued to support the idea that there is a growing demand for both business qualifications and technical qualifications in e-commerce, and they should be combined in a way that provides customers with added value (c.f. Adam et al. 1999; European Union 2002; Tuunainen 1999).

Especially the interviewed experts emphasised that an important challenge for SMEs is "qualification management", related to the need to find appropriate ways and methods to combine qualifications and to make persons with different qualification areas work together smoothly within an enterprise (c.f. Ruohotie 2002; Sähkö ja elektroniikkateollisuusliitto & Teknologian kehittämiskeskus 2000; Senge 1994; Väärälä 1998). On the other hand, also individuals, especially in small enterprises, may often be expected to have such combinations of diverse qualifications and skills that are rare (European Union 2002, 33). Nevertheless, especially in the expert interviews, a successful electronic commerce was considered to require an ability to coordinate and manage complex entities, but at the same time also mastery of specific work tasks requiring deep and specialised knowledge and skills. On the other hand, outsourcing of specialised activities was seen as a good option, especially for small enterprises with often very limited resources. Anyway, regardless of the size of the enterprise, industry or the chosen strategy, a unanimous view of both the experts and the representatives of enterprises was that none of the presented main categories of qualifications may fail, especially in the long term. This again emphasises the importance of having a wide *entity* of qualifications in the use of SMEs in e-commerce.

When analysing the qualification requirements of electronic commerce, it should also be pointed out that there may be considerable differences between enterprises in different industries, and also within industries (c.f. Berg et al. 1999). The differences are partly related to the strategic decisions on the role of e-commerce in an enterprise's overall business (c.f. Heikkilä, Kallio, Laine, Saarinen, Saarinen, Tinnilä, Tuunainen & Vepsäläinen 1998; Tuunainen 1999). Also in the results of the expert interviews, the relative importance of

qualifications was seen to depend on the products sold. According to an expert view, products can be divided to two main categories, i.e. standardised mass products and individually tailored special products. Here, competitive advantage in mass product markets was seen to be strongly based on well-working and efficient logistics, whereas in tailored special products competitiveness was seen to be based especially on a deep understanding of customer needs. Consequently, the qualification requirements were also seen to differ in weight depending on the products in question.

The maturity level of the Internet use and electronic commerce can also be considered as a significant factor affecting the relative importance of different qualification areas (c.f. Kettunen & Filenius 1998, 36). Depending on the chosen strategy, some enterprises may want to develop their e-commerce activities into the most developed levels, whereas other enterprises want to stick to less developed levels. Also in the interviews of the representatives of enterprises, it was found that especially those enterprises that regarded their position in electronic markets defensive rather than offensive expressed that they first want to concentrate on developing some basic solutions for e-commerce, and potentially update and develop these solutions in the future. In turn, enterprises with more offensive strategies strongly emphasized the meaning of first-mover advantage and a quick development of new innovative solutions to customers. Hence, they aimed at a quick progress to the high maturity levels of e-commerce activities. On the other hand, as illustrated in Paragraph 2, the potential benefits of e-commerce may increase together with the deepness of solutions, but on the other hand, typically, the deeper and more mature e-commerce solutions are developed, the more demanding and versatile qualifications are also required.

In any case, qualifications are a development area that requires attention in enterprises that want to operate successfully in the evolving electronic commerce markets. Regardless of the chosen strategy, it is also important to remember that qualification requirements are not constant, and continuous development and lifelong learning can be seen as essential processes to maintain long term business success. From this viewpoint, it can be considered problematic that in the interviews of the representatives of enterprises, especially the small and more defensively positioned enterprises did not seem to have systematic development plans for their e-commerce related qualifications, and many enterprises also seemed to miss a well-thought e-commerce development strategy. This may be partly explained by the novelty of e-commerce in enterprises at the time of interviewing, as well as a relatively short planning perspective, which has been found as a general characteristic of small enterprises (e.g. Littunen 1998; Metsä-Tokela, Tulkki & Tuominen 1998; Storey 1999). Still, especially in the long run, there is a considerable threat that without a systematic development work these enterprises are not going to be able to reach their full e-commerce potential, but on the contrary they may be in growing risk to lose their market positions.

6.2.2 Quantitative analysis of the subareas of qualification requirements

To produce a more detailed picture of the requirements for different kinds of qualifications in electronic commerce of SMEs, in the next stage of analyses, the chosen four main areas of qualifications were further divided to a number of subareas. This division was planned by the researcher in cooperation with a small number of experts that supported the construction of the qualification classification for the purposes of this research.

The chosen subareas and the classification of them are presented Figure 8. In general, also the interviewed experts considered the chosen classification and the subareas of qualifications to be a comprehensive and systematic presentation. A common view of the experts was also that the analysis included a good variety of central and significant qualifications that are required in successful electronic commerce. The experts also expressed that each of the chosen qualification areas has its own role and meaning in the entity of well-organized electronic commerce of an SME. This provided a good starting point to go further in the analyses.

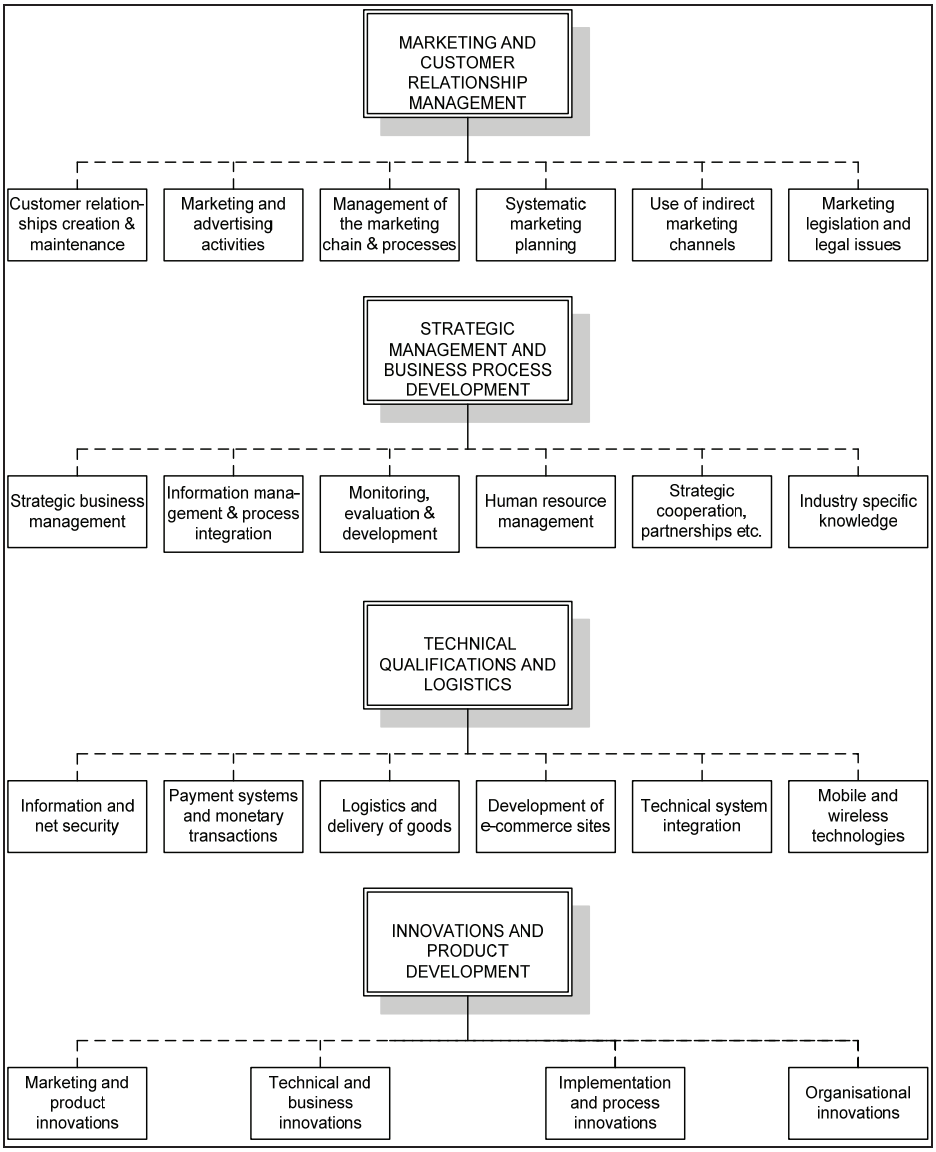

FIGURE 8 Chosen subareas of qualifications included in the analysis

Related to the subareas illustrated in Figure 8, a further analysis of different qualification requirements of electronic commerce was conducted based on the interviewing of both the chosen experts and the representatives of enterprises. The analysis included both quantitative and qualitative parts. First, the significance of different subareas was analysed by a quantitative analysis, which was very similar to the one conducted earlier for the four main areas of qualifications. Then, the process proceeded into a qualitative content analysis, which was another important part to meet the objectives of this research.

As mentioned, the main principle of the quantitative analysis of the subareas of qualifications was the same as earlier in the case of the analysis of the chosen main qualification areas, i.e. to analyse the significance of each of the subareas from the viewpoint of SMEs in electronic commerce. Thus, the analysis concentrated on SMEs, and it was divided to a short term (1 year) and long term (5 years). Thus, the interviewees were also provided with an opportunity to assess how the importance of different subareas evolves when moving from the near future to a more distant future. The analysis was based on a similar five-point ordinal rating scale as the earlier analysis of main categories (5 = high significance -> 1 = low significance).

The chosen research method, i.e. an applied version of the Delphi technique with two interviewing rounds, enabled a deep analysis of different subareas of qualifications. The quantitative analysis of the significance of different subareas was conducted already in the first round of interviews both with the experts and the representatives of enterprises. Attached to the quantitative analysis, the interviewees were also asked about their ideas of whether SMEs typically do/should take care of the tasks related to each qualification subarea themselves, or whether these tasks are or should be outsourced to specialised service providers. After the analysis of the results of the first round, and based on the observed need for additional and further information, the analysis was further deepened and focused in the second round of interviews. Then, especially the representatives of enterprises were asked to map out in detail the different work tasks, needs for specific knowledge and skills, educational and training needs, outsourcing questions etc. related to each of the chosen subarea.

The answering to the above questions turned out to difficult. Especially in the case of the representatives of enterprises, it was hard to get as specific and detailed information as desired. In a number of cases, the difficulty to answer to the questions seemed to be related to the fact that it was probably the first time that the representatives of enterprises were forced to think about e-commerce related qualifications very systematically. Especially in the case of traditional enterprises, e-commerce activities also often seemed to be developed on the side of all other tasks without particular extra resources. Particularly in these enterprises, especially the technical solutions of e-commerce were typically outsourced to specialised companies. Probably, this is often a wise strategic decision, which also enables the enterprises to concentrate on their own core competencies (c.f. Hamel & Prahalad 1990).

Figure 9 illustrates the quantitative results of the analysis of the significance of the chosen qualification subareas in the short term (1 year). The results of the experts and the representatives of enterprises are reported as separate data series. Similarly, Figure 10 presents the results of the significance of different subareas in the long term (5 years). The presented results are based on the mean values of the answers of both interviewee groups separately. Other statistical indicators are reported in Appendix 6.

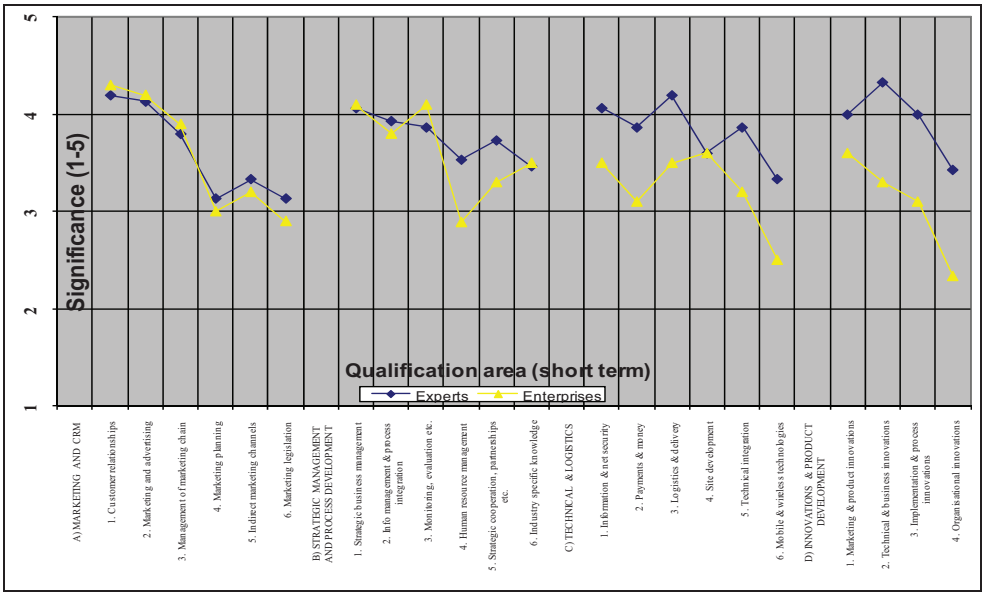

FIGURE 9 Significance of the different subareas of qualifications (short term)

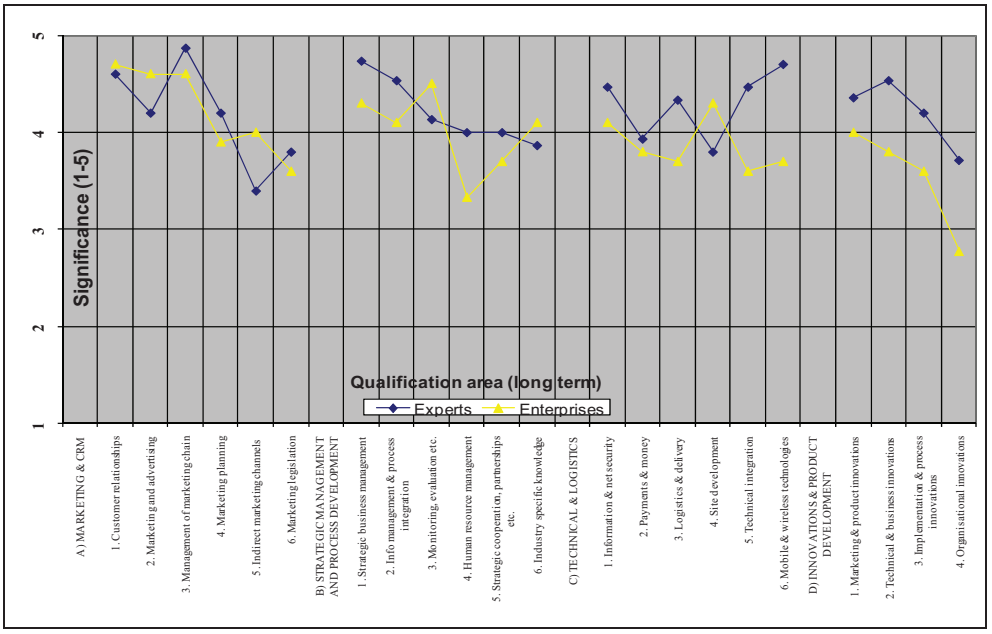

FIGURE 10 Significance of the different subareas of qualifications (long term)

Like in the results of the analysis of the main areas of qualifications, also in the analysis of the subareas the interviewees emphasised that all the areas of qualifications have their own role in a well-functioning entity of electronic commerce. This further strengthened the idea that for SMEs in electronic commerce there seems to be a need to build a diversified and sufficiently integrated qualification base that fits to the special needs and resources of a particular enterprise to manage the different functions, activities and processes. Despite the fact that is kind of comprehensive approach to qualifications was emphasised in the interviews and can also be seen from the research results, it is still possible to point out a number of specified subareas of qualifications that were considered especially significant. According to the results of the conducted analysis these were the following:

- *Marketing and customer relationship management*
  - Creation and development of customer relationships
  - Management of the marketing chain
  - Advertising in the new electronic environment
- *Strategic management and business process development*
  - Strategic business management and coordination of the business entity
  - Appropriate integration of business processes
  - Continuous monitoring and assessment of business development
- *Technical qualifications and logistics*
  - Technical integration of systems
  - Logistics and delivery of goods
  - Reliable information and network security solutions
- *Innovations and product development*
  - New business innovations (new business and cooperation models etc.)
  - Marketing and product innovations

In all the interviews, the importance of marketing, sales and customer service was highlighted as a key area of qualifications in the different development stages of electronic commerce. The interviewees' high appreciation of these qualifications is not surprising since they are directly connected to everyday customer-oriented business and income raising of enterprises. In general, especially the representatives of enterprises felt that customer service in electronic commerce should be of top class, as it may be the most important single factor to gain satisfied and loyal customers. Especially the representatives of offensive e-commerce start-ups also emphasised the need for a systematic building of a well-established and reliable brand. Additionally, all the interviewed representatives of different enterprises highlighted the importance of the choice of right cooperative partners. In the case of the enterprises that had traditional commerce and e-commerce side by side in their overall business concept, one of the main challenges was seen to be the integration of different functions and business systems so that traditional commerce and electronic commerce could support one another. Typical to these enterprises was that they had entered e-commerce relatively slowly, and also before significant further investments they wanted to see what kinds of solutions will be found successful

by the experiences of other organizations. Instead, the more offensive and e-commerce specialised enterprises had adopted much more aggressive, growth-oriented and pioneership-emphasising strategies, which also had reflections on their views of required qualifications. For example, customer relationship management (CRM) systems were an area of significant investments in these enterprises, and to utilise these systems effectively they also wanted to learn how to gather information on their customers. This was also considered to help them to further develop their business activities and e.g. to personalise their services better to different kinds of customers.

6.3 Qualitative content analysis of the subcategories of qualifications

In the following, the qualitative contents and meaning of each of the chosen subcategory of qualifications is analysed in depth. The results are partly based also on the results of the first round of the conducted interviews, but especially in the case of the representatives of enterprises also the results of the second round, where special attention was given to these questions.

This part of this study and its analysing process can be seen as a thematic content analysis of qualitative data (e.g. Eskola & Suoranta 1998). In the analysis, the central viewpoints and results from the content of the two-rounded interviewing with the experts and the representatives of enterprises are put together based on the reduction of data and other principles that were used in the data analysis (as described earlier). The aim has been to have a deeper look at the content and meaning of each specified subarea of qualifications from the viewpoint of SMEs in electronic commerce. Also, the most important work tasks related to each qualification, most significant development needs etc. were questions of interest as a part of this analysis. The structure of the analysis is based on the same classification of qualification areas and their subareas as the quantitative analysis earlier. The reporting proceeds in an order where the subareas under each main area of qualifications are reported one by one in the same order as in the interviewing questionnaires.

6.3.1 Marketing and customer relationship management

In the qualification area of marketing and customer relationship management, both the experts and the representatives of enterprises highly emphasised the general meaning of customer orientation. For electronic commerce to be successful, customers must feel that they are provided with some kind of added value compared to traditional commerce. The ability to create this added value is a very important competitive factor also for SMEs in electronic commerce, and each individual enterprise should carefully consider how it could be created in their particular case. It was pointed out that the products of enterprises in e-commerce can often be quite similar to one another, and customer

relationship management may often be the critical factor that finally determines customers' purchasing decisions. Important elements included under this main area of qualifications were also seen to include brand management, reliability of an enterprise and its image. In the future, it was considered essential for enterprises to think about the means by which they could positively differentiate from a potentially vast variety of competitors in these areas.

Creation and development of customer relationships is an area of qualifications, which the interviewees considered to be rising in importance in tight competitive environment. Also in literature, it has been pointed out that it is crucial for online sellers to understand their customers and the factors that influence their decisions to have or not have long-term relationships with a seller (e.g. Janson & Cecez-Kecmanovic 2005, 329-331; Kim, Zhao & Yang 2008, 2).

Customer relationship management (CRM) can be defined as the ability of an enterprise to capture and integrate customer data from different sources and then consolidate, analyze and distribute the data to various points to improve the quality and thereby also profitability of customer relationships (e.g. Ali-Yrkkö et al 2001; Ratnasingam 2008, 31; Tinnilä et al. 2008, 35-36). According to Statistics Finland (2008), 27% of Finnish enterprises had some kind of computer-based CRM system in spring 2008, but there was variation according to the size of an enterprise, and of the enterprises with 5-9 employees only 20% had such system, whereas in the case of the enterprises with 100 or more employees the corresponding figure was 56%.

At least in theory, the Internet provides an easy and inexpensive way for SMEs to manage customer relationships. When incorporated properly into the daily business processes, electronic commerce CRM has been argued to provide reduced cost of communicating with customers, provision of Web-based opportunities for self-service activities that reduce administrative overhead, integrated delivery of services and value chain cost savings, boosted sales through Internet marketing, and improved interaction between an enterprise and its customers (Ratnasingam 2008, 32-33).

Electronic commerce opens new opportunities for the development of CRM systems, e.g. by the collection and use of information on customer behaviour (e.g. Quinn 1999). Special tools have also started to emerge for the electronic CRM of enterprises, e.g. to enable an efficient identification of the best customers and allocation of marketing, sales and service resources to promote customer loyalty. The interviewed experts also anticipated that the CRM systems are going to be integrated increasingly with the wider business systems, such as enterprise resource planning (ERP) systems where they are in use. Thus, an idea is to integrate business solutions and IT solutions to work together to offer superior customer value and satisfaction (c.f. Kim, Zhao & Yang 2008, 14).

The interactivity offered by the Internet provides new opportunities for one-to-one marketing (e.g. Coulson-Thomas 2000, 471-472), which may increase loyalty and open new ways to establish enduring relationships with customers (c.f. McGowan et al. 2001). In the expert interviews, the significance of customer

relationship management (CRM) was seen to further increase as enterprises in e-commerce will have to find both new customers and to maintain existing customer relationships, especially the valuable ones with strategic importance (c.f. Kotler 1999). Also in earlier research results, it has been highlighted that effective customer service is as important in e-commerce operations as it is in bricks-and-mortar contexts (e.g. Karagozoglu & Lindell 2004). According to the interviewed experts, typical features for the development of good e-commerce customer service were considered to include, for example, providing thorough product information, implementing a question and answer data base, designing a site that is easy to navigate, making on-line ordering simple and secure, providing sufficient warranty information, and clear return policies and procedures.

Often, however, the exploitation of these kinds of systems is still at an early development stage especially in small enterprises. Also in the enterprises that participated in the interviews of this study, wide and integrated CRM systems turned out to be rare. In practice, customer information in the interviewed enterprises still often seemed to be scattered in different kinds of manual and electronic systems, which can hamper the successful formation of the overall picture of customer information. Nevertheless, especially the interviewed experts emphasised that in the future the different systems and customer contact points should be able to communicate, which poses challenges for information systems and their integration.

According to different research results, in electronic shopping, customers typically value easiness of shopping, a wide variety of alternatives, opportunity to buy more tailored products, entertaining shopping experience and advantageous prices. Especially in consumer markets, an increasingly important role success seems to be played by the anticipation of customers' needs and the development of creative service concepts (c.f. Berg et al. 1999; Brännback & Puhakainen 1998). A central question also for SMEs in electronic commerce is thus the ability to understand customer behaviour and its changes and learn continuously from and about the customers. Enterprises should also respond carefully to customer feedback, and use it to develop their activities. The growing power of customers is a factor that was also in the interviews seen to pose new challenges for enterprises in electronic markets (c.f. Kotler 1999). Unless customers experience e-commerce solutions to be beneficial to themselves, it is likely that their user rate remains low and they are not profitable. Therefore, excellent customer service may become a critical success factor for SMEs in e-commerce, and attention should be paid to it.

During the interviews, an idea that the experts stressed was that customer service should be personalised enough. On the other hand, the solutions should be able to bear large customer loads simultaneously. Increased customer profiling was seen to provide new opportunities for personalized interaction and feedback channels between SMEs and customers. In fact, also Hyvönen, Järvelä & Piiroinen (2008) found this to be among the important expectations of e-commerce consumers, together with competitive prices, user-friendly and

reliable web pages, appropriate product offerings and quick delivery. Nevertheless, in the expert interviews it was also pointed out that customers may be very sensitive about their privacy and the use of their personal information. Especially in Europe, customers have been found often not to be willing to give detailed information about themselves to e-commerce enterprises, or they may even purposefully give false information, which makes customer profiling problematic. Also it has to be remembered that the use of customer information is restricted by legislation.

Anyway, especially in the expert interviews, CRM solutions were seen as potentially very beneficial tools when they are used correctly. There was also discussion about the use of specialised companies and consultants that offer their products and services to aid enterprises to take advantage of these tools. From the viewpoint of small enterprises, these services were, however, often considered relatively expensive, which was seen to often prevent their use. On the other hand, it was also pointed out that CRM should not be seen merely as a number of IT solutions, but the role of IT was seen also in the future only to provide useful tools to get these human-oriented tasks successfully conducted.

The interviewed experts were strongly in favour of the view that CRM is a strategic business function that should be at least partly taken care of inside an enterprise, although parts of practical solutions can - and often even should - be outsourced to specialists. It was seen that normally it is not useful to try to develop the technical CRM systems inside enterprises, since there is a number of potentially useful systems, programs etc. available in the market to be bought (or rented). On the other hand, however, it was emphasised that there should be enough qualifications, knowledge and skills within an enterprise to use and exploit these systems.

Also the interviewed representatives of enterprises considered CRM as an essential function for their businesses, since the whole business success was seen to be dependent on customers. Without exception, the enterprises also convinced that they take customer feedback seriously, and try to have constant contacts and interaction with their customers through different channels. Several enterprises also reported that they try to profile their customers, at least to some extent. Some of the practical parts of CRM activities had been outsourced in a few of the interviewed enterprises, but mainly the enterprises reported to take care of these actions themselves. On the other hand, a number of enterprises were still at a relatively early development stage in terms of their e-commerce CRM systems, and their solutions were told to be still under further development and construction. Still, the role of IT was often expected to increase in the CRM of the interviewed enterprises, but several of them complained that the lack of resources hampers systematic CRM activities, and hoped that they could concentrate in the development of these things in the future.

Marketing and advertising in the new electronic environment is a subarea of qualifications, where the implementation of activities seems to be largely

dependent on the size and development phase of an enterprise. It has been experienced that it usually requires hard work and money to gain visibility in the Internet, and the Internet presence itself does not guarantee anything more than perhaps some curious site visitors (e.g. Cannon 2000). Especially for new and previously unknown enterprises (e.g. "dot com's"), a successful entry to electronic markets therefore usually requires substantial marketing investments, since a well-built brand, a good image and safety are very important factors to gain customers in the open Internet environment (e.g. Amor 1999, Reza Kiani 1998). It is encouraging, however, that there are some earlier research results that the SMEs' efforts to extend their marketing and selling online have contributed positively to their performance both in terms of sales growth and profitability. Also, e-commerce has been found to be a potentially effective vehicle to enhance an enterprise's visibility, even though its strategy would not focus primarily on e-commerce sales. (Karagozoglu & Lindell 2004.)

According to the interviewed experts, the building of a reliable brand was considered to be a very important qualification or competence area. A strong brand was seen to provide added value to a commercial web site and its products, to increase customer loyalty, and thereby also to help substantially to raise income and achieve the basic aims of the business. Also in literature, the importance of brand has been further emphasized by the fact that electronic commerce markets are open and international, and there may be a very large number of different products provided for a certain purpose (e.g. Cannon 2000; Benjamin & Wigand 1995). From the comments of the interviewed experts it can also be pointed out that in the development of their brands, enterprises were seen to have potential advantage from the help specialised external experts, but the problem from the viewpoint of small enterprises was again considered to be resources, since brand building campaigns designed by professionals can be very costly projects. Actually, it has been even estimated that brand building may require more capital than any other investment at early stages of running an e-commerce based business.

Overall, the extent of marketing costs may come as a surprise to enterprises in electronic commerce. Although the Internet itself provides new kinds of opportunities for (interactive) marketing, often other marketing channels and more traditional media (newspapers, magazines, television etc.) also need to be used to reach a sufficient amount of potential customers. A question related to Internet marketing is also direct marketing to customers, as it is very cheap, but on the other hand, people often find direct advertising messages (e.g. by e-mail) irritating and negative. One solution that has been suggested also for small enterprises to raise awareness has been the use of portals, electronic "shopping centres" and also Internet communities in their marketing (e.g. Benjamin 1998; Steinbock 1998). By participating in these kinds of sites, enterprises can also take advantage of their potential joint marketing campaigns. However, the interviewed experts commented that also here it is important to weight costs and benefits against one another before making

decisions. Also, it is important to take care that the chosen sites attract right potential customer groups. Additionally, it was considered important to profile the marketing and its message right to appeal to potential new and also existing customers.

The interviewed experts shared the opinion that in marketing and advertising, strategic decisions should be made inside an enterprise, but the implementation of practical solutions should usually be outsourced to specialised service providers. In the case of small enterprises, important things to consider were also seen to be potential marketing cooperation models, which could partly help to compensate the typically small marketing resources of SMEs. The interviewed representatives of enterprises also unanimously stressed the strategic importance of marketing and advertising as crucial functions of their businesses. Parts of them were typically carried out by own personnel also to save in costs, but some parts were planned and implemented by professionals outside the interviewed enterprises. A common problem again was commented to be the lack of resources, and several of the representatives of enterprises expressed that they do not have enough money, time or other resources for extensive advertising of their e-commerce activities. In practice, the situation seemed to be often such that there was only one person in an enterprise, who tried to do what (s)he can for this area, often also burdened by a number of other tasks. The marketing channels that the interviewed enterprises used included Internet advertising, but also a number of more traditional marketing channels, like newspapers, trade fairs and other events, and information materials targeted to key customer groups. However, especially the more offensive new enterprises that were specializing only in electronic commerce tried to effectively tackle the opportunities of electronic marketing, for example by personalised information targeted straight to their customers.

The central qualifications in the area of advertising and marketing communication were seen to include at least vitalisation of the image of an enterprise, planning of an optimal marketing strategy, understanding of different marketing channels and their use and combining, as well as the development of a unique marketing message. However, many of the interviewed representatives of enterprises felt that the lack of qualifications, and also the lack of resources, set limitations to their marketing and advertising activities. Especially the utilization of electronic marketing media was seen as an area where education, training and guidance were desired. Additionally, different seminars and self-studying were seen as realistic and relevant ways to gain new advertising and marketing knowledge and qualifications. Seminars were also considered important because they provide an opportunity to hear the experiences of other enterprises and companies.

Due to limited resources, the practical implementation of marketing and advertising within the enterprises was in most cases taken done by common office programs, and often not by any more professional tools. Since the enterprises did not have or did not want to invest in any special techniques and the related know-how, the graphical planning of e.g. marketing brochures or

advertisements, as well as naturally the actual printing process, were typically outsourced to specialised service providers. The same kind of phenomenon could also be seen in Internet marketing. This can be seen relevant, since the interviewed small enterprises wanted to concentrate on their main operations, and they were typically also satisfied with those new media companies, printing houses etc. that they were cooperating with.

Management of the marketing chain can be seen to be connected strongly to the most strategic functions of an enterprise. Therefore, especially the interviewed experts had a strong view that it should be kept inside enterprises. Especially the technical implementation of this area, however, provides opportunities for cooperation, and the interviewed experts anticipated that in the future there will most likely be an increasing number of companies that specialise only in providing services for a certain phase in the marketing chain. Still, the management of the overall marketing chain was seen as an important prerequisite of successful long-term operations of enterprises (c.f. Cannon 2000; Kotler 1999; Lynn, Maltz, Jurkat & Hammer 1999; Quinn 1999).

Because the change of supplier of goods or services is in electronic commerce even easier than in traditional commerce, it is even more important than before for enterprises to manage the entity of customer-oriented marketing processes smoothly. If need be, the systems and concepts of the management of the overall marketing chain must also be reoriented, if the customers do not behave as expected. All in all, the management of the overall marketing chain was seen in the interviews as a subarea of qualifications, which can provide good elements for success, and on the other hand the deficiencies in which may often be the reason for the potential lack of business success.

Also the representatives of interviewed enterprises expressed that they understand the importance of the planning and management of the overall marketing chain. However, the solutions for this were typically still in a development stage and their technical implementation was not completed. A factor that again restricted the opportunities of small enterprises was seen to be the lack of resources. The different parts or phases of marketing chain were typically also not systematically analysed in the interviewed enterprises However, several enterprises said to be developing some attempts e.g. to utilise networking as a tool in the development of their marketing chain. Here, the cooperation with other enterprises was often seen as fruitful, when all can also learn from one another's experiences. In general, the transfer of information and experiences was seen as a useful source of information for the development of marketing and advertising in the future. On the other hand, this was perhaps a bit surprising, since it could be expected that enterprises do not necessarily wish to share their good marketing practices with other enterprises.

Systematic marketing planning was seen as a significant part of a well-working entity of marketing activities and also important for a successful implementation of marketing activities. Marketing planning and the supportive

analyses are areas where the interviewed experts also suggested the help of external experts to be usually beneficial. Since cost-effectiveness is a very important question in the marketing of SMEs, different analyses and measurements were also seen as an element that can help the efficient use of scarce marketing resources. Hereby, enterprises can also compare different marketing channels and choose the most appropriate of them. Nevertheless, it was also pointed out that the measurements can be problematic, and often the enterprises do not have necessary qualifications for the planning and implementation of them, and they do not know what actually should be measured and how. Measurements and their analysis are also problematised by the fact that consumers do not often seem to be willing to give information about themselves, do not want their Internet actions to be monitored, profiles to be created based on their behaviour etc. If enterprises want to measure and analyse their customers, the interviewed experts emphasised that important factors are trust and open communication about what the customer information and measurements are used for. In any case, the interviewed experts believed that the role of measurements and analyses will be further emphasized in marketing planning processes in the future.

In the interviewed enterprises, to the relatively small extent that they had been made, the analysis for the support of marketing planning were bought from external service providers or research institutes. In the future, however, many of the enterprises expressed to be willing to develop their own qualifications in this area. Still, especially small enterprises did not experience to have resources for extensive analyses and measurements, but marketing seemed to be developed more based on the "rule of thumb" and own practical experiences. It is also illustrative, that a part of the interviewed enterprises expressed that they had actually not done any systematic measurements or market analyses. Still, a typical practice seemed to be that enterprises at least had tried to investigate where the people that visited their e-commerce sites were from. Still, a common opinion among the representatives of interviewed enterprises was that different market information could and should be utilised better. Here, there were also considerable differences between more traditional enterprises and new enterprises that specialised in electronic commerce, and the offensive new enterprises seemed to pay a lot more attention to these questions in their business. An example of this is one enterprise, where strategic planning was supported e.g. by conducting very systematic regional analyses of potential customers and comparison of this information to the customer base needed for the running of profitable logistics in different regions. Additionally, customer satisfaction surveys seemed to be made more systematically in new offensive enterprises than in other interviewed enterprises. However, all the enterprises still felt the need for more specific information of and analysing tools for the behaviour of Internet customers to understand how their e-commerce activities should be developed. For example, the information on the domains of the web page visitors was not often considered to be very beneficial or sufficient information to base marketing on, and more accurate information

was desired, in addition to wider analyses of the development trends of el-commerce.

Use of indirect marketing channels is also an interesting development area of electronic commerce. However, at the time of interviewing, its significance was by the interviewed experts considered to be lower than earlier described qualification subareas in the area of marketing and customer relationship management. Nevertheless, both the experts and the representatives of enterprises experienced that for example a success in tests or comparisons could have a potentially significant indirect positive effect on the marketing and sales of an enterprise and its products. Another important discussion topic here was also the meaning of virtual communities that gather together like-minded persons, and the importance of which has been generally considered to be growing in the Internet (e.g. Amor 1999; Benjamin 1998; De Kare-Silver 2000; Hagel & Armstrong 1997; Kanter 2001; Tinnilä et al. 2008). A couple of interviewed experts felt that in the future virtual communities may even become the most important marketing channel for many Internet-based businesses. Different kinds of virtual communities are created based on social purposes, but also mainly for economic purposes, for example in an attempt to get a certain product or service at a lower price by gathering people in the Internet to make a joint purchase together.

The opportunity and the ability to take advantage of virtual communities in business was considered to be strongly related to the nature of the business. Also, many of the interviewed enterprises did not seem to feel that these issues would have a very significant meaning, and it seemed that more traditional marketing methods were going to be emphasised at least in these enterprises also in the future. Overall, hence, the representatives of enterprises were so far concentrating on the exploitation of virtual communities in their marketing very little or not at all. Also tests and comparisons were seen by the representatives of enterprises as factors that did not have a very crucial impact on their businesses, at least not in the short run. However, the meaning of indirect marketing channels was not underestimated either, and especially in the long run their importance was anticipated to potentially increase as a channel to influence different target groups.

Marketing legislation and legal issues were mutually seen as a vital question both in the interviews of experts and the representatives of enterprises. It was emphasised that the importance of these questions must be understood, or otherwise an enterprise can make serious mistakes. This is further emphasised if an enterprise starts to operate in international markets and different cultures. The experts admitted, however, that the international legislation on electronic commerce has been lagging behind the technological developments, and as a consequence of this the rules are not always clear. For example, in Finland, e.g. the collection and use of sensitive customer data has been limited by quite a tight privacy protection legislation, which also restrains e.g. the trade of

customer information. Actually, it has been argued that the lack of clear rules and regulations has been one of the important factors hindering the development of international electronic commerce (e.g. Tuunainen 1999). The global nature of the Internet also causes problems for systems like taxation, and there is a risk that the making of international agreements and compliance with them may remain as a problematic question also in the future.

According to the interviewed experts, the basic things about legislation and privacy protection must be understood and managed within enterprises, although e.g. specialised law expertise can also be acquired from external experts. The experts also emphasized that this is a very important and sensitive area, which can have a profound effect on the reliability and trust of an enterprise in the eyes of the customers. Also the interviewed enterprises themselves seemed to take these questions seriously, and they were seen as a normal part of good business practices. The representatives of enterprises expressed that a basic understanding of these questions definitely belongs to the qualifications required from their personnel, though external experts can provide additional help in potential problem situations.

As a conclusion on the results of the qualitative content analysis of the qualification requirements in the area of marketing and customer relationship management, it can first be pointed out that the qualifications in this area were unanimously seen worth emphasising. In addition to the basic understanding of marketing issues, requirements for enterprises and their personnel typically also include a strong understanding of the special characteristics of e-commerce and its environment, development of appropriate CRM systems, ability to build a reliable brand and image etc. Especially important is also to understand and manage the marketing chain in a comprehensive way, and to be able to find the most critical success factors in the case of each individual enterprise. Thus, these factors can be seen as typically important contributors, when SMEs aim to successfully extend their marketing and selling activities to the electronic environment (c.f. Karagozoglu & Lindell 2004).

Although a remarkable part of marketing activities can, and for some parts often even should, be outsourced, also within enterprises at least a good basic knowledge and understanding of this area entity is needed. Marketing and advertising are also sensitive areas with direct and indirect contacts to customers, and since customers determine the success potential of an enterprise, there is no room for serious mistakes. All in all, it can be concluded that the enterprises that anticipate the future needs and expectations of customers and are able to respond to them are likely to be the enterprises with best success potential in the future electronic commerce of SMEs.

6.3.2 Strategic management and business process development

Several of the interviewed experts had a view that the strategic solutions of electronic commerce are often still in a development and experimental phase, and it takes some time before they can be considered to be in a more permanent form. Nevertheless, it was considered important that the formation of the strategic basis and management of electronic commerce is developed in enterprises already in the short term. In the long run, the importance of these areas was seen to largely determine the development direction of an enterprise.

According to the interviewed experts, ***strategic business management and coordination of the business entity*** is a subarea of qualifications, which will be in a very crucial position from the viewpoint of long-term business success. An especially important success factor was seen to be a clear and understandable earning logic. According to the experts, strategic management should be an internal activity in enterprises, although external experts, consultants etc. can be used to support strategy processes if need be. Basically, it was emphasised that entrepreneurs or managers must do the final decisions of the future directions of business themselves, and commit themselves and the personnel to these decisions. Here, it should also be pointed out that the strategies of e-commerce should not concentrate too much only on the development of information systems and technological solutions, but the strategies should be based on careful considerations about the business and its background logic (e.g. Berg et al. 1999; Tuunainen 1999). In a central position was seen to be the comprehensive development of strategic business processes, which can be supported by appropriate information technology solutions. Still, it should be remembered that IT solutions are only tools to support business, and they should be determined by the decisions on the business, and not vice versa.

Also the interviewed representatives of enterprises stressed the importance of strategic management of their business as an essential success factor. The representatives of enterprises highlighted that without a clear understanding of the aims and means, it is usually impossible to build a viable long-term business. Nevertheless, in the interviewed small enterprises strategic management was often not a very systematic process, but it was rather seen as a part of everyday activities, and the approach to business was thereby very pragmatic. Important strategic activities were considered to be management of e-commerce related entities, ”active wondering”, active following of the developments and networking, and active connections with different interest groups. For the interviewed enterprises, one strategic objective also seemed to be the development of their personnel and its qualifications, and also their attitudes to electronic commerce. In general, the enterprises experienced the strategic development of e-commerce as a very challenging area, because the development of e-markets is difficult to predict. Especially in the case of small enterprises, this can also be seen as one of the reasons that may lead them to partly neglect systematic strategy work, and concentrate more only on short-term developments based on their own experiences and ideas. Instead, business

functions like financial administration were considered in the interviews to be more like everyday routines, and a typical practice in the interviewed enterprises was to outsource them to trustworthy bookkeeping offices.

Information management and process integration is an area of qualifications, where the role of process integration was emphasised especially in the views of the interviewed experts. They experienced that highly integrated processes can be a strategically very important prerequisite of cost-efficient and profitable electronic commerce in the future (c.f. Berg et al. 1999; Kettunen & Filenius 1998).

In literature, it has also been pointed out that without proper integration to different background systems and processes, the e-commerce solutions of an enterprise may be insufficient and ineffective (e.g. Ruohonen 2005, 5). The importance of integration typically increases with the volume of trade, but the meaning of integration should nevertheless be considered also in small enterprises early enough. The interviewed experts had a common view that the integration should be implemented so that the strategic decisions on the chosen solutions are made inside an enterprise, but the technical implementation should normally be left to relevant external experts. On the other hand, the interviewed experts thought that enterprises may often have even quite good chances to take care of e.g. the maintenance of the systems themselves.

In the expert interviews, the importance of information management was considered somewhat less significant than that of process integration. Partly this is also due to the fact that the interviewed experts felt that process integration can partly serve also the finding of good solutions to these questions. Further, the term knowledge management can be defined to refer to all the procedures, systems and tools that are used in enterprises to create, save, share and apply information and knowledge (Ali-Yrkkö et al. 2001, 40; c.f. Nonaka & Takeuchi 1995; Ståhle & Grönroos 1999). Since knowledge and learning are increasingly important factors of production, the role of knowledge management has been highlighted as a crucial success factor of the future. Also, it has been found that knowledge management systems and processes should not be too technically-oriented (e.g. Wil Foppen 2000). Related to these arguments, it was emphasised in the expert interviews that the different parts of a knowledge management system should be based on the business strategies of an enterprise, and the connections to other processes of an enterprise should be remembered. It should be kept in mind that the general aim of knowledge management is to guarantee that the information and knowledge within an organization can be used efficiently and efficient creation of new information and knowledge is supported and encouraged (e.g. Ali-Yrkkö et al. 2001). This way knowledge management may create new kinds of competitive advantage by transferring the knowledge of the individuals efficiently into mutual knowledge that serves the overall aims of the organization as a whole (e.g. Nonaka & Takeuchi 1995; Senge 1994; Ståhle & Grönroos 1999; Virkkunen 2002).

In the interviewed enterprises, process integration and information/ knowledge management activities and related qualifications were taken care of in varying ways. Typically, at least some business processes had been tried to integrate with one another, but deeply-integrated systems for electronic commerce could only be found in the enterprises that had completely specialised in e-commerce. However, several other enterprises also expressed interest in this area, but the practical implementation opportunities were again shadowed by the lack of financial and other resources. Those enterprises that already had integrated systems, had utilized external experts to aid their development. Also the other interviewed representatives of enterprises estimated that they would need expert support if they were to plan and implement any substantial integration of systems or processes.

In terms of knowledge management and information documentation, important development areas included, in turn, the planning and implementation of more systematic and sophisticated knowledge management systems, together with the development of electronic documentation systems. From the answers of the interviewees, it could also be heard that the knowledge management related answers of the enterprises were oriented strongly towards technical solutions, instead of e.g. tackling the complex questions of knowledge creation processes and the development of a knowledge creating organizational culture.

Continuous monitoring, evaluation and development of business was seen by the interviewed experts as a kind of necessary in-built system that could help enterprises to follow their financial and other development, quality, customer satisfaction, functioning of different processes etc. It also enables enterprises to get valuable information about potential future development needs, which can improve the reactivity – or even proactivity – of enterprises in a changing business environment (e.g. Mannermaa (toim.) 2000). The experts conceived that continuous evaluation and development should be an integral part of a well-working and future-oriented business system. The common view of both experts and interviewed enterprises on the implementation of the business follow-up system was that it is an internal process in enterprises, where external help can be used if need be.

In the interviewed enterprises, the follow-up and evaluation of success was considered to be a normal part of business and its development, which also helps them to check the focus areas of activities both at the strategic and at the operative level. Typically, the interviewed enterprises conducted quite accurate follow-up on sales, and also tried to investigate how the sales and overall business success could be further developed. This is a positive finding, since it has been found important that enterprises organise their e-commerce activities and their development carefully, and monitor the results continually (e.g. Ruohonen 2005, 5). In addition, it was positive to hear that several enterprises mentioned that alternative future plans are made, comparisons to other

enterprises are conducted, and good practices are tried to be found both from the own industry but also from other, following the ideas of benchmarking.

According to the interviewed experts, ***human resource management*** is another critical success factor for many of the enterprises in electronic commerce. Especially strategic e-commerce management and technical IT development were considered as areas with a lack of qualified professionals in the future. Overall, a highly qualified personnel was emphasised to become an increasingly critical and scarce resource for many enterprises. Simultaneously, the potential lack of appropriate personnel emphasises the role of incentives that support the engagement of the personnel. In more traditional work positions in commercial field, the experts instead did not see it as problematic to find the personnel with right qualifications.

In terms of practical implementation, the interviewed experts considered human resource management as an area, which enterprises should take responsibility of internally, and which is for several parts difficult to outsource. However, for example in recruitment and the development of personnel and work community, there is also a chance to use external consultants, if it is seen as appropriate or necessary. The interviewed enterprises had considerable differences in the practical arrangements of their human resource management systems. These differences were also partly related to the size of enterprises. In the smallest of interviewed SMEs, the questions of human resource managed were not seen so acute, and typically the small traditional enterprises had not been able to recruit new personnel with e-commerce specialisation, and they had doubts on their ability to do so in the future either. Still, the need for new specialized personnel had usually been noticed, and the problem seemed to be that this need and financial resources often did not seem to meet. Therefore, the potential longer-term changes in the structure of the personnel were still often an open question. On the other hand, a bit bigger enterprises and also those of the smallest enterprises that had specialised in electronic commerce had a different situation and they had hired special labour force for e-commerce activities.

The development of the electronic commerce related qualifications of the existing personnel seemed to be a central human resource management related question in the case of all interviewed enterprises. In them, there seemed to be a common fear that a part of their personnel may be dropping out of the development, and it had also turned out difficult to get them excited on self-development. For example, there was a case, where the personnel had been provided with an opportunity to participate in a course on e-commerce know-how and skills, but the personnel was not ready to use any leisure time for this kind of course, and the idea was rejected. Still, the problem is that especially in small enterprises it is often impossible to use normal working hours for this kind of course activities, and therefore the personnel should also be ready to "sacrifice" their own time for personal development, according to the idea of life-long learning. One potential option to solve these problems was presented

by one of the representatives of enterprises as a model, where one or a couple of support persons would first be trained in courses, and then they could spread their know-how and skills within the work community. However, this idea may also involve problems, including how to find volunteers and arrange time for them to do on-the-job teaching of their colleagues. Anyway, according to the enterprise interviews, the general trend seemed to be that at least more defensive small enterprises did not believe that they are forced or able to have any remarkable changes in their personnel. At the same time, a few enterprises wished that e-business systems could help them in routine-like activities and free some time for other purposes.

Also ***industry specific knowledge*** is a demanding area that requires own qualifications, and the importance of which should not be neglected. The interviewed experts highlighted the choice of right cooperative partners as a very important factor related to the understanding of own industry and the players there. Especially for SMEs successful networks and strategic alliances have been generally seen as potentially crucial success factors of the future (e.g. Conklin & Tapp 2000; Ruohonen 2005). Also different kinds of analyses of competitors have their own important role in the development of business, and they can help enterprises to find a reasonable market position. In the implementation of analyses, external experts can be utilized, as well as applicable researches, surveys etc. Although analyses of these issues can be important also to support strategic development, the interviewed experts did not see it as important as many other areas as an individual area of qualifications. Anyway, both the interviewed experts and the representatives of enterprises felt that this area also requires sufficient attention, although the enterprises did not seem to have been able to concentrate on these issues very systematically.

A general wide understanding of the industry and business environment is also an area of qualifications, which the interviewed experts considered meaningful, but on the other hand it was typically not seen quite as critical as many other areas. From the viewpoint of SMEs it was anyway felt important to understand the most important development trends of own industry and environment. Related analyses were felt important to be made within an enterprise, where own business and its important questions are known best. To the extent that they are relevant, also existing researches, surveys, barometers etc. were seen to be of potentially high value to enterprises. It was also pointed out that the internationalisation of the environment creates new requirements for the analysis of the industry, and simultaneously it is important to know the local environment and culture of all target market areas. Still, the interviewed experts also stressed that especially for small enterprises it is not relevant to try to analyse all possible things in the environment, because it would require too much time and other scarce resources that should be targeted on the issues that are most important (c.f. Järvi-Laturi 2000). The experts also saw that especially small enterprises do not have opportunities to affect their environment to a

large extent. Larger companies, instead, may potentially have also this kind of power. In the interviews of the representatives of enterprises it also seemed that the smallest of enterprises concentrated least on the analyses, and often saw themselves more as followers without large-scale efforts in this area.

As a conclusion of the qualitative content analysis of the subareas of qualifications in strategic management and business process development, it can be pointed out that strategic management overall was seen as a factor that to a large extent determines the overall development direction and success potential of enterprises also in electronic commerce. A very important success factor will be successful management of the entity of business, which can also be supported by a relevant integration of different business processes and systems. It is also important to have a clear understanding and vision of what the aims of electronic commerce are, what the role of electronic commerce is in the business of an enterprise, and what practical development measures should be taken and how. A general idea that a successful enterprise is able to create the strategies that enable success, implement them successfully, but also renew them according to changing conditions can thus be applied also in electronic commerce.

Strategic renewal and development in an anticipatory manner also poses challenges for organisations and its personnel, which should continually develop itself and its qualifications, cope with changes and also spread information and knowledge throughout an organisation. Hence, in a very significant role in electronic commerce can be argued to be also managerial and leadership qualifications. In many cases, it is the deficiencies in these skills that can lead to failures also in e-commerce enterprises, and training and updating of overall these skills can thus be seen as a good potential source of competitive advantage.

6.3.3 Technical solutions and logistics

Technical solutions and logistics are areas of qualifications, where the interviewed experts felt a strong need for solid solutions. Technical solutions are important, since they support the management of crucial e-commerce processes. Also in the future, technical solutions provide a basis for the simultaneous exploitation and management of a number of different customer interfaces and channels. The technical solutions in individual enterprises depend heavily on the nature of business, and they should always be designed case by case. These solutions and logistics require specialized know-how, and for both of them it is also important to choose the right tools and the right scale. Still, it should be once again noted that the development projects of electronic commerce in enterprises should not be too technology-led, but the solutions should be guided by the business and customer needs.

Information and net security was considered by the interviewed experts to be a necessary part of the technical solutions in electronic commerce. Information security was considered as an essential question for enterprises also from the strategic point of view. In order to enable reliable e-commerce, it is necessary

for all parties to be guaranteed that they get all the information on commercial transaction exactly in the right content and right form. Additionally it must be safeguarded that each party gets only the appropriate information, and on the other hand that no external parties can get access to the information. In the Internet, unfortunately, the threats of invasions of privacy or sabotages are real, and as a consequence the questions of continuous updating of information security systems should be strongly highlighted (e.g. Zhao, Koch & Luo 1998). In many cases, enterprises and customers have also felt that information security questions are one of the central problems that restrict the positive development of electronic commerce (e.g. Furnell & Karweni 1999; Ojala 1998; Teollisuus ja työnantajat 2000).

Related to information and net security, an important factor for successful e-commerce is trust. Trust is a multifaceted phenomenon that has been found to have a significant effect on customers' intention to visit websites and do online business. Therefore, it can be considered crucial for enterprises to pay a lot of attention to the development of trustful customer relationships (e.g. Kim, Zhao & Yang 2008; Salo & Karjaluoto 2007). Often, those e-commerce enterprises that have made trust as the key differentiator for their online strategies and developed special trust-building activities with their customers have achieved better results than others (Bourlakis, Papagiannidis & Fox 2008, 67).

Information and net security can thus be considered as one of the necessary prerequisites of doing electronic commerce in the future, and only one problem or serious mistake can destroy reliability and be fatal to an enterprise. At a general level, it seems that there is a continuous race taking place between the developers of information security solutions and the parties that want to break the existing systems. Consequently, even a certain amount of governmental or international regulation (e.g. to deal with potential fraud and credit card misuse) has been suggested as a potential way to make the Internet a trustworthy commerce platform and to promote its further commercial diffusion (Zhu, Kraemer & Xu 2003, 265). Simultaneously, the development of the Internet and electronic commerce has been creating markets for enterprises that specialise in information security solutions and systems. According to Statistics Finland, the proportion of Finnish enterprises, where ICT related security problems has caused loss of information or working hours was 22% in 2005. Awareness of security risks has increased, and in 2005 already 95% of enterprises with at least 5 employees had anti-virus software and 91% a firewall in their computers. Investments in information and data security questions can also be seen in the growing use of secure servers (supporting e.g. SSL or HTTPS) (Statistics Finland 2006, 41).

According to the interviewed experts, at least in the case of SMEs, it is typically beneficial and reasonable to buy the technical solutions of information security from specialised external experts. On the other hand, the maintenance and updating of information security were seen as activities that will also be possible to do within enterprises by the use of appropriate programs etc. It was also often mentioned by an interviewed experts that the most strategic parts of

information security solutions should not be completely outsourced, but the control of them should be kept in own hands as far as possible. However, in the case of many small enterprises, it is possible that all the technical solutions of electronic commerce have been acquired from special application service provider (ASP) companies, who then can be responsible for the information security of the sites and the systems of an SME quite completely.

Also in the interviewed enterprises, the importance of information and net security was highly emphasized, already because it was seen as an essential factor to make the customers feel safe. The enterprises had mainly bought their information security solutions from external service providers, although a couple of the most strongly IT oriented enterprises had also developed certain systems themselves. All the enterprises expressed their interest and willingness to invest in information security even more in the future than at the time of the interviews. Especially the interviewed experts emphasised the development and maintenance of high-class information security is a continuous process that in principle involves the whole enterprise and all its functions and processes. However, especially in the smallest enterprises a problem may be that they do not have any persons responsible for and capable of taking care of these questions. One of the interviewed experts criticised service providers for aiming to sell unnecessarily heavy and complex solutions also to very small enterprises. On the other hand, the representatives of enterprises commonly agreed that it is better not to take risk, and to have rather too strong than too weak information security solutions. For the future, it would nevertheless be important that also within SMEs there would be persons that have an understanding of information security solutions, even though the technical solutions were acquired from external parties.

Also, well functioning ***payment systems and monetary transactions*** are an important part of successful electronic commerce, like commerce in general. The payment systems should be easy and secure to customers. Related to security, the payment must also be verified trustfully. Customers must also be secured that they get the paid products or services and that the charge for products or services takes place in an agreed manner and amount (e.g. Ojala 1998). The seller, in turn, has a need to identify the customer in a reliable way and get a guarantee that the ordered products will really be paid (c.f. Zhu, Kraemer & Xu 2003). From the viewpoint of enterprises, usually the best practice would be to get the payment before the transfer of a product, or at the latest in connection with it. There are risks in allowing customers to have a long time for payment, and it can also pose pressures on liquidity (e.g. Paavilainen 1999, 92-98). Still, from the viewpoint of customers, the situation is about the opposite, and typically customers would also like to have a chance to check the delivered product(s) before payment.

Enterprises should be able to provide their customers with a variety of relevant, reliable and simple payment systems. Hereby, it can be assumed that each customer could find a suitable payment method, and payment problems

would not cause a barrier for the development of electronic commerce. Nevertheless, payment problems have sometimes been seen as a considerable obstacle in e-commerce transactions, and they have been argued to be a significant factor that has slowed down the development of business-to-consumer (B-to-C) commerce over the Internet. For example, online sales have suffered from potential security risks perceived by potential customers, who have been afraid to provide their credit card information online. Especially in the case of e-commerce sellers located outside Finland, a credit card may often have been considered as the only relevant method of payment, at least for foreign customers, and the threat of the misuse of credit card numbers and personal information has restricted customers' willingness to make orders. Actions have been taken e.g. by credit card companies to solve these problems, and some new methods of payment (such as PayPal) have been developed, which provide at least partial solutions to the problems.

At least in Finland, a common method of payment also in e-commerce has turned out to be the electronic payment systems of different banks. They have also been linked to many large Internet "shopping malls" and increasingly also to the sites of many individual e-commerce companies or enterprises. This payment method seems to be working well, and in the future it can be expected to be used in increasingly wide geographic areas, when banks further deepen their international cooperation. Also different kinds of chip cards have been under development, as well as different experiments of electronic money. In addition, especially in business-to-business (B-to-B) commerce, there are solutions for integrated electronic billing and payment systems that have been found to usually work well and efficiently. The problems of billing and payment thereby seem to be typically more significant in B-to-C markets, and especially in international commerce. The interviewed experts commonly believed, however, that at the latest when the questions of electronic identification are solved practically, the payment problems in electronic commerce will be further solved, and gradually the payments in the Internet will become at least as safe and natural as payments in traditional commerce. In the long run, the payment systems were thus generally seen to develop as a kind of basic thing that all the enterprises in e-commerce will automatically have in good order, and consequently it may also be difficult to have differentiated competitive advantage in this area.

In the interviews with the representatives of enterprises, a number of different payment methods came out. Only a small part of enterprises provided their customers with an opportunity to pay directly by electronic banking systems. Common ways to take care of billing and payments turned out to be traditional methods like cash on delivery (C.O.D) or traditional invoicing. Several enterprises, however, anticipated that the situation will change, and the use of Internet-based payment systems and electronic invoicing will increase. Credit card was also a commonly accepted method of payment in the interviewed enterprises, and in general the enterprises were willing to develop the payment systems to an increasingly customer-friendly direction. An

interesting future opportunity was also considered to be potential cooperation with telephone operators, and thus new kinds of payment systems based on telephone billing.

Logistics and delivery of goods is a subarea of qualifications in electronic commerce with a number of options for organization (e.g. Kolmonen 1999). A unanimous opinion of the interviewed experts was that long-term success is impossible for an enterprise, unless it can deliver its products in a way that satisfies its customers. Only in a limited number of product groups, the delivery is possible in electronic form through the Internet. In most product groups, the products still have to be delivered by more traditional methods also in the future, and therefore the role of efficient and reliable logistics is especially important. Consequently, strong qualifications in this area were seen by the interviewed experts to form a potential basis for the competitiveness and growth of an enterprise.

Especially in the future, it can be anticipated that the delivery and logistics systems of e-commerce will involve an increasing number of specialised companies. On the other hand, one of the future competitive factors for enterprises seems to be the comprehensive management of supply chain, by which the reliability of deliveries, inventories, lead times of production and general cost-effectiveness can be tried to improve (c.f. Ali-Yrkkö et al. 2001). There are also IT system solutions for supply chain management, which are also provided to SMEs (Ali-Yrkkö et al. 2001, 31). From the viewpoint of SMEs one relevant alternative can also be to acquire these solutions from special application service providers (ASPs), which may also lower the threshold of SMEs to start using these systems that otherwise would require relatively high investments to build and maintain.

In the expert interviews, logistics and the delivery of goods were considered as crucial questions for SMEs in e-commerce, and cost-effective, reliable and fast delivery solutions should be found. The interviewed experts believed that as the value chains and structures of e-commerce further develop and get potentially restructured, also new kinds of effective solutions for e-commerce logistics will also be developed. From the viewpoint of SMEs, logistics is also a function that in many cases can be outsourced to a great extent, and usually it pays off to seek for suitable cooperation partners for its implementation (e.g. Giaglis et al 1999; Heikkilä et al. 2000). It was also anticipated in the expert interviews that as e-commerce becomes increasingly popular, it is likely that there will also be a growing number of logistics companies specialised in its distribution or warehousing.

Also the interviewed representatives of enterprises typically regarded logistics as a critical development area in their e-commerce. Often, the logistical operations were to a large part outsourced and handled by specialised companies (post, distribution companies etc.) In any case, logistics can be expected to remain as an important question for the majority of enterprises, including also most of the interviewed enterprises, since also in the future it

was considered very unlikely that all their products would be digitalised and distributed through electronic networks.

Development of e-commerce sites is an area of qualifications, the significance of which can according to the interviewed experts vary quite considerably depending on the size of an enterprise, the chosen overall business strategy, development phase of the business, cooperative partners etc. Anyway, in order to develop and continuously maintain a good electronic commerce site, remarkable investments in terms of both money and work are usually needed (c.f. Porter 2001). Electronic commerce lacks the same kind of personal interaction between the buyer and the seller that is typical to traditional commerce. Consequently, the interviewed experts emphasised that e-commerce sites and their services have to be planned so easy to use that ordering and buying can be done as self-service without problems. In the planning of sites, an important factor was also considered to be the balancing between usability and a clear structure, ability to load quickly, and visual impressiveness and "adventurism". Still, in the end, what was seen most important is that a site can attract the targeted customer groups to enter, but also to buy and order.

In the answers of the interviewed experts, clarity and simplicity, as well as a short loading time of pages were considered as most important basic requirements for a good commercial Internet site. It was also pointed out that typically it is not most crucial to concentrate on technical solutions as an end in itself, but on providing visitors of the site with relevant and attractive content and a pleasant experience. Unfortunately, in some cases it still seems that the other questions related to content have been left on the side when looking for technically attractive solutions: However, in the conducted expert interviews this situation was expected to change, and creative content was seen as the most important and scarce competitive factor.

The outlook of a commercial Internet site has a great meaning, because it also plays an important role in forming the image of an enterprise. Especially at the beginning, the first www-pages of enterprises often were, and can still be, a bit like enterprise brochures by their nature. Also nowadays, a large number of commercial sites in the Internet may be mainly like electronic product catalogues, based on which customers can make orders either by web-based ordering systems or via e-mail. In more developed solutions there are, nevertheless, also interactive elements, more developed opportunities for information search, feedback etc. A continually increasing number of electronic commerce enterprises also has e.g. some kind of "shopping car" idea and electronic payment systems. Especially for the enterprises specializing only in electronic commerce these kinds of solutions were considered as necessary prerequisites also in the expert interviews. Still, an important question to think about when planning the content of commercial sites are costs, which often can be quite directly related to the amount and complexity of the technical systems. Thus, the creation of just a purely brochure-like net page or a simple, product catalogue-based commercial site is typically a lot cheaper than the

establishment of a more sophisticated and structurally complex e-commerce site with interactive and potentially personalised parts etc. Important issues to consider here are also information security solutions, which as described earlier should not fail in any situation.

According to the interviewed experts, the technical implementation of commercial Internet sites and www-pages is typically reasonable for SMEs to outsource to a large extent. On the other hand, according to the common view of the interviewed experts, for a majority of enterprises it would be beneficial to be able to update at least the basic content within an enterprise. Still, it was also emphasised that the development of sites should not be an end of itself, but rather a tool by which own business strategy, customer service brand etc. can be supported.

The ideas of the interviewed representatives of enterprises were very similar with the ones of the experts. The initial planning and technical implementation of their commercial Internet sites was mostly ordered from external service providers. Instead, the maintenance of the basic site content was for most parts done by an enterprise's own personnel, but more demanding maintenance and development tasks were typically carried out by the use of external help or hired specialists. The investments on the outlook, content and other elements of the sites varied in the interviewed enterprises also in relation to the chosen strategy and the role of e-commerce in the overall business concept. The basic situation was such that the offensive enterprises specialising in e-commerce had invested clearly more on the development of their sites, which was an expected result. In turn, the majority of more traditional enterprises seemed to be satisfied with more basic solutions, at least so far. Some of them also considered that the role of the Internet in the business was still mostly supportive, despite the fact that they also provided an opportunity to buy their products directly through the e-commerce channel.

Although the interviewed enterprises tended to use external professionals in the implementation of their sites, they also felt it important to have some level of own understanding of these issues. This was also seen to help them to communicate better with the external service providers. In addition, it was stressed that the informational content and specific details of their sites should come from within an enterprise. A part of enterprises also experienced that new technical tools, ready-made programs etc. could help them to take care of their sites increasingly by themselves in the future. Also, a few enterprises were participating in portals or electronic "shopping malls", but the other part expressed that despite some good offers they had decided not to participate in them, because they did not see it profitable. Especially the traditional and defensive enterprises seemed to have a precautious attitude to the further development of commercial Internet sites, and investments were considered to heavily depend on the overall future development of financial and other resources.

Technical system integration was seen by the interviewed experts as a central success factor in the future electronic commerce. The solutions of e-commerce were commonly considered to need an increasingly close connection with the more traditional operational systems of enterprises. Hereby, customers could also be served without unnecessary information breaks and with sufficient flexibility. These ideas are in line with earlier findigs, where technology integration that helps information sharing within an enterprise and along the value chain has been found to have a potentially strong contribution to value creation (c.f. Ratnasingam 2008, 31). According to the interviewed experts, electronic shopping sites that are not sufficiently integrated with the necessary background systems are normally not going to provide success in the future. Although integration of certain basic systems has already taken place in an increasing number of companies and enterprises, according to the common view of the interviewed experts, the integration would need to become much more systematic and far-reaching as the volumes of e-commerce grow. Typically, the practical integration work is outsourced in enterprises, and especially SMEs themselves do not typically have necessary know-how for it. Often, the integration is also made problematic by the fact that in an enterprise there may already be many different systems that do not support one another.

In the interviewed enterprises, the attitude towards the importance of the technical integration of systems varied to some extent. A part of enterprises had already actively started to develop this area, and was trying to utilize the benefits of integrated systems. However, several of the small traditional enterprises felt that this issue is not acute or relevant for them. Although the importance of the issue was accepted especially in the long run, a part of enterprises expressed that they still want to follow the development trends for a while before making any big new investments. Several of the representatives of the enterprises expressed that integration will be done in the future depending on the situation and the development of needs.

To the extent that it had been done, the technical integration of systems had been almost without exception outsourced in the interviewed enterprises, since they did not feel to have enough own qualifications or human resources for it. However, by participating also themselves in the process, the enterprises tried to guarantee that the solutions would be tailored to their own specific needs. Usually, those enterprises that had implemented integration solutions were happy with their service providers, but there was also some criticism. An example of this could be the following comment: ”Service providers gave a too glorious picture of the quality of their services and their own qualifications. Only the later developed versions have reached the level of quality that should have been reached right from the beginning.”

Mobile and wireless technologies are an area of qualifications that have been lately in a very dynamic development phase, and the role of them has been increasingly discussed also in e-commerce (e.g. Bhatti 2007). The interviewed experts expected the role of wireless solutions in e-commerce to grow

considerably in the future. From the Finnish point of view, wireless solutions are also important because of the Finland-based company Nokia and the specialised knowledge that has been developed in this area. In e-commerce, the interviewed experts believed that the use of wireless technologies is still in an early development phase, and new and potentially groundbreaking innovations and solutions were expected to emerge. It was also anticipated that the development of data transfer speed can provide opportunities for completely new kinds of businesses utilising the mobile Internet. Although the early WAP phones, for example, were a commercial flop and despite partly high expectations not very substantial commerce was made with them, in the future it can be expected that an increasing part of all business transactions will be made through mobile and wireless devices. The new generations of mobile devices have already opened new opportunities for mobile business, and have enabled the transfer of increasing amounts of data in accelerating speed. Simultaneously, also the WLAN technologies have been developing rapidly and provide a potential channel for the spread of e-commerce through wireless Internet. Still, the interviewed experts did not believe that wireless technologies would completely replace wired computer and network technologies in the near future, but they will develop side by side. The experts also highly emphasized the importance of usability and ease of use when the future mobile devices are planned, because too complicated devices were not considered likely to provide normal customers the kind of added value that they would expect.

According to the interviewed experts, the technical implementation of wireless solutions for electronic commerce in SMEs should typically be outsourced. This was also the case with those pioneers of the interviewed enterprises that had already tried wireless commerce. Although the interviewed enterprises believed that commerce through wireless technologies might increase considerably in the long-term future, majority of them were still observing the situation, and they did not believe to participate in these developments in the near future. Also, a part of the representatives of enterprises also felt that their industry does not suit well to wireless commerce. It also seemed that the decisions on the potential entry to wireless e-commerce were also strongly tied to resource questions, as a result of which e.g. publicly co-financed projects were hoped to lower the threshold also for small enterprises.

6.3.4 Innovations and product development

For the future development of electronic commerce, significant factors are naturally different kinds of innovations, as well as value adding product development. In the expert interviews, important future areas of innovations were considered to be new service and content concepts, wireless service solutions, information security innovations and new deeply integrated e-commerce systems. It has also been pointed out as a general positive factor of electronic commerce that it enables, or even forces,

enterprises to new trials and thus creates development opportunities for both products and business concepts and processes.

Marketing and product innovations are an area, which the experts considered very significant to develop and maintain competitiveness in the electronic commerce of the future. Enterprises should adapt to changing market situations, anticipate the needs and expectations of customers, and respond to them better than competitors. In the expert interviews, the most fruitful areas of new innovations were nevertheless also seen partly dependent on the industry and business activities of an enterprise. In any case, innovations in the fields of customer oriented service concepts and creative earning logics were considered important areas basically for any enterprise.

Despite the growing importance of customer orientation, it should also not be forgotten that the basis of success are still often good products, and thereby product innovations also remain a very important source of competitiveness also in the future. In this sense, there may also be considerable variations between different product groups, and the interviewed experts anticipated that it is technologically advanced products, where the success potential will be most strongly related to the ability to develop new innovative product concepts and product features.

A common view of the interviewed experts was that enterprises could also use expert help when trying to develop new innovations. Potentially significant factors supporting innovativeness were also seen to be different teams, networks etc. Also in the interviewed enterprises, an attempt to innovate was expressed, and cooperation, networking and sharing of ideas were mentioned to be utilised here. Generally, in small enterprises that do not have own specialised departments for product development activities, new innovations typically have to be created based on the qualifications, competencies, experiences and ideas of ordinary workers (c.f. Metsä-Tokela, Tulkki & Tuominen 1998, 17). In the interviewed enterprises, customers were also typically seen as sources of innovations. Usually, the representatives of the interviewed enterprises also believed that they have a high-level of industry-specific know-how and their personnel is innovative and creative. An important development area was seen to be the further development of electronic marketing, although there were also enterprises that did not see any renewals in products or marketing in sight.

The interviewed experts also experienced ***technical and business innovations*** to be of significance for many SMEs in electronic commerce, especially in the long run. In this respect, important development areas were considered to be new kinds of cooperative and networking solutions and new types of Internet earning logics (c.f. Conklin & Tapp 2000). A remarkable role was also given to process innovations and new ideas to combine and integrate components, processes and systems to provide added value. Here, it should nevertheless be remembered that the aim of the systems development should be to provide new solutions to support the basic business, and therefore the

solutions should be planned connected to strategies and with a sufficiently long time span.

Anyway, in the future it can be expected that business process management will be more and more based on highly integrated enterprise resource planning (ERP) systems (e.g. Luomala et al. 2001). Still, especially in SMEs, there was often not considered to be enough own qualifications, knowledge and skills for the development and management of these systems, and also the use of them may involve technical and organisational challenges. Overall, in terms of technical innovations, the interviewed experts generally considered that small enterprises may not usually have resources or even will to invest in them, but the solutions were expected to be bought mainly from external cooperation parties. However, to guarantee appropriate solutions, the interviewed experts pointed out that enterprises should have qualifications to pick the most suitable alternatives of the ones available.

In turn, the interviewed enterprises experienced that the potential innovations in their electronic commerce are mainly based on a profound understanding of own industry and business processes. Still, external experts were also sometimes used to refine the ideas. On the other hand, a part of enterprises expressed that they have made a conscious decision to proceed in e-commerce solutions ”behind the front line”. Additionally, a part of enterprises also informed that their opportunities for innovativeness are restricted by agreements etc. they are tied to. Lack of resources was also mentioned as a limiting factor for the implementation of potential new ideas. At the time of interviewing, a part of the enterprises also admitted that their e-commerce was still in a kind of a practise period, and a phase of learning by trial and error. In any case, the enterprises expressed that they have an attempt to develop also new concepts, also together with cooperative partners.

Implementation and process innovations were considered both among the experts and the representatives of enterprises to have A high practical meaning, since product, process and other innovations were not considered to have value unless they can be successfully applied in practice. The experts pointed out that strategic solutions on the implementation should be decided by enterprises themselves, potentially with the help of experts. The technical work of practical implementation of new solutions, in turn, was an area, where outsourcing was recommended. Still, only few of the interviewed enterprises expressed that they would have any radical innovations in the implementation of their business in sight in the near future.

Both the interviewed experts and the representatives of enterprises saw ***organisational innovations*** to have a potentially smaller meaning from the viewpoint of SMEs than the earlier areas of innovations. Organisational innovations were not typically seen as a value for themselves, but they were considered needed, if they e.g. help enterprises to provide the customers with better service. On the other hand, it was pointed out in the expert interviews

that new business or customer service models, earning logics etc may themselves require also some organisational restructuring. A challenge for enterprises was considered to be that enterprises should actually be at the same time dynamic and flexible, but also systematic and well planned. Possible organizational changes were also seen to be linked to the questions of outsourcing and new kinds of cooperation (e.g. Conklin & Tapp 2000; Hamel 2002). Here, it was emphasised that it is essential for enterprises to understand what is beneficial to do within own organization with own qualifications, and what not.

Also related to organisational innovations, in the future, it seems that basic business units of the economy will be increasingly network enterprises. At the same time it seems that traditional hierarchical and inflexible organisational structures will be gradually replaced by more flexible structures. Also, asymmetrical networks have been emphasised in literature as future structures with a considerable ability to adapt to changes and also get reorganised if need be (e.g. Castells 1996; Kanter 2001). On the other hand, those organizations that are not able to renew themselves according to changing requirements have been argued to be in a growing danger to start losing their competitiveness. Thus, also successful e-commerce of the future has been said to typically require new kinds of cooperation models, where complex value creating networks share the responsibilities of adding value to final products and customer experiences (c.f. Castells 1996; Conklin & Tapp 2000; Järvelä & Tinnilä (toim.) 2000;). Involved in these networks may be a large number of enterprises, whose cooperation can be based on more loose commercial relations and practices than has usually been the case in traditional commerce. On the other hand, the networks can sometimes also have a leading company or enterprise that set the principles for the network and involved enterprises (e.g. Conklin & Tapp 2000, 225). As a result of networking of entrepreneurs, value is increasingly generated and delivered by supply chains than individual companies, and competition in the future can also shift increasingly between consortia of collaborating partners. Simultaneously, the importance of shared learning along and across supply and value chains has begun to be further emphasised.

According to a general view of the interviewed experts, potential organisational innovations and organisational changes should be mainly planned within enterprises where the best understanding of own business is, although the expertise of external consultants can also be used to support the changes. In turn, in a large part of the interviewed enterprises, it seemed to be difficult to understand the meaning of organizational innovations, which was also related to the small size of these enterprises. The enterprises did not usually believe that any radical changes would be expectable in their organizations, at least not in the short run. Still, it can be expected that an increasing number of new aggressive competitors is likely to enter the electronic markets with lean and cost-efficient structures especially designed for e-commerce. This can also increase the pressure on more traditional organisations to restructure themselves. However, it must be remembered that

the changes in organisational structures and culture typically require more time than e.g. technical changes, which may lengthen the period before the potential positive effects are realised.

6.4 Summary of key findings

In SMEs, the development of electronic commerce and its qualifications is a challenging topic that can be considered as a dynamic learning process (c.f. Kamel & Hussein 2004). According to the conducted analyses, a versatile set of different kinds of qualifications is needed in successful electronic commerce. A significant question is the ability to integrate the business solutions and technical solutions of electronic commerce so that they support the overall strategy and competencies of an enterprise (c.f. Fraser, Fraser & McDonald 2000).

The analyses of the qualification requirements in this section of the study were based on a systematic, thematic grouping of qualification areas. Under the selected groups, a number of qualification areas were found highly significant both by the interviewed experts and representatives of enterprises. Based on the conducted analyses, a number of interesting findings were revealed. Among the most important of them can be argued to be the following:

- For the SMEs in electronic commerce, business related qualifications seem to play a significant role, even to a greater extent than technical qualifications.
- The need for a deep understanding of the role of electronic commerce in an enterprise's business seems to be emphasising in order to develop qualifications to manage increasingly integrated electronic commerce and other processes.
- There also seems to be a growing demand for the ability to combine business qualifications and technical qualifications so that they support one another.
- Simultaneously with the growing demand for overprofessional qualifications, there also seems to be a growing demand for very specific and detailed qualifications in special areas (like information security). On the other hand, these qualificatios may also be acquired by the use of outsourced services.

The used classification of qualifications was found relevant by the interviewees, and there were not many suggestions for additional qualification areas of particularly high significance. Suggested potential additions were mainly related to overprofessional or general qualifications, including understanding of different cultures, cooperative and networking skills, as well as an ability and motivation for continuous learning and development.

A large number of SMEs is still typically at a relatively early stage in terms of learning of the requirements of evolving e-commerce environment. They are also challenged by scarce resources and often the consequent inability to hire specialized people for their e-commerce activities. Also, of high meaning for enterprises would be not to concentrate on individuals and their qualifications too separately, but try to build a well-working and innovative entity, where

different individuals and their qualifications support one another creating added value to customers. Thus, a management challenge remains to make individuals of certain defined areas of responsibility to work fruitfully together. This could be supported by an organizational culture that promotes learning a encourages the development of qualifications and competencies (e.g. Kanter 2001; Kolehmainen 2004; Moilanen 2001).

Overall, previous analyses indicate that successful electronic commerce of a SME requires versatile qualifications both at the individual and organizational levels. Next, it is therefore important to turn interest to the question of how to develop the required qualifications in appropriate ways.

7 RESULTS ON HOW TO RESPOND TO QUALIFICATION REQUIREMENTS

Previous chapter concentrated on the first main research question, i.e. the qualification requirements of SMEs in Internet-based electronic commerce. In turn, this chapter turns interest to the second main research question, i.e. how SMEs could be supported to acquire the required qualifications.

The chapter starts from analyses and considerations on education and its development needs, and proceeds to discuss the opportunities and challenges of training and on-the-job learning activities, which could be potential ways for SMEs themselves to support the development of their e-commerce related qualifications. Finally, the anticipation of qualification requirements in SMEs and potential tools and ideas to respond to anticipation challenges are analysed and discussed.

7.1 Educational system and its development needs

As the previous analyses indicate, a successful electronic commerce requires versatile qualifications from SMEs. The development or acquisition of the required qualifications is a challenge that calls for appropriate solutions. Education in its different forms is typically a very important tool for the development of qualifications, know-how and skills. Education provides both formal qualifications (degrees, diplomas etc.) and practical qualifications needed for successful work processes (e.g. Ellström 1998; Kivinen et al. 1989). Traditionally, individuals in Finland have acquired their basic qualifications that are necessary to compete in the labour market in different stages of formal education at school, vocational training, universities, etc. Also from the viewpoint of electronic commerce, the development of suitable education is thus a crucial question.

In a wide meaning, education and training can be defined to involve all the different kinds of systems and functions that a society, organizations or

individuals have to ensure that they have the qualifications and competencies needed for successful operations. However, the qualifications are not stable as a result of changes in the economy and work environment, which poses challenges for the development of education and training systems (c.f. Achtenhagen 1998; Stasz 1998; Toikka 1984). For example, Coulson-Thomas (2000, 473) and Ritsilä (1998) have criticised that many of the parties that are responsible for education and training do not appear to be anticipating or even sufficiently reacting to trends and developments in the business environment.

International comparisons have indicated that the Finns are quite well educated, and the Finnish educational system has gained success in international comparisons. The number of graduates from secondary education, vocational education and higher education is relatively high in Finland. However, it can be argued that the ultimate evaluation of education and its results is ability to meet the demands of labour markets and the changing needs of the economy and the society. In an ideal situation, the quantity and quality of education fit perfectly to the needs of the labour markets (c.f. Ruohotie & Honka 1988; Varmola 1996). Then, the productivity of educational investments is also high, and the used inputs provide an economically desirable output (c.f. Blaug 1992).

Traditionally, education in Finland has been relatively institution-based, and vocational education has also been mainly provided in specialised educational institutions. This system has been considered to have worked relatively well especially in the past decades when the pace of changes in working life was relatively slow, work organisations were more functional and hierarchical, and also work tasks were typically more clearly divided than nowadays (e.g. Uusitalo 2001, 14). However, partly due to the traditionally institutional nature of Finnish education, enterprises and companies increasingly started to criticise the educational system of an inability to meet the changing demands of labour markets, and of reluctance to listen to entrepreneurs and their ideas (e.g. Kivinen, Tulkki, Metsä-Tokila & Hyvönen 1998; Ritsilä 1998; Uusitalo 2001; c.f. Stasz 1998; Streumer & Bjorkquist 1998). Lately, cooperation between educational institutions and enterprises & other work communities has been increasing, reforms have been made, and new methods for systematic cooperation have been introduced and developed continuously (e.g. Stenström & Nikkanen 2005). There have also been different projects providing opportunities for educational experiments. Also at the European level, it has been explored that schools and higher education have not always been able to provide new job seekers with the most appropriate qualifications. This problem has been addressed and new kinds of potential solutions have been started to be sought.

In Finland, the elementary education is based on a comprehensive school, which is normally compulsory education to all Finnish persons. After that, most Finns continue their studies, and make a choice between two main options: secondary school (lukio) and basic vocational education. Graduation from both these gives also the eligibility to apply for higher education at polytechnics (nowadays often called universities of applied sciences) and universities. A

difference between polytechnics (universities of applied sciences) and traditional university education is that the universities of applied sciences have profiled themselves as an alternative with an emphasised aim to combine theory and practice and hereby provide qualified labour force to serve the enterprises and development needs of their regions (Ammattikorkeakoululaki 9.5.2003/351). Traditional universities, in turn, have traditionally focused more on scientific orientation, although, for example in business studies, there can also be a growing professional orientation to provide highly qualified professionals with good expertise in their own field. A deep cooperation with enterprises is particularly expected and required in basic vocational education and studies at polytechnics (c.f. Stenström & Nikkanen 2005), but especially lately it has also been increasingly emphasised in university education. Further, also in basic education and secondary school e.g. the theme of entrepreneurship has been given a growing role both in curricula and practical implementation of studies.

7.1.1 Evaluation of different forms of education

In the analyses of this thesis, as a part of the conducted interviewing process, both the chosen experts and the representatives of enterprises were asked to evaluate how well the different forms of education can respond to the qualification requirements of electronic commerce. The quantitative part of the evaluation was based on a five-point ordinal rating scale (5 = very well -> 1 = very badly). Then, this quantitative analysis was further complemented by a qualitative part, where the interviewees were asked to express their ideas and experiences of each form of education, and also give suggestions for the future development of them.

Table 8 gathers together the mean values of the answers from both the experts and the representatives of enterprises. Other statistical data on the answers is reported in Appendix 7.

TABLE 8 Ability of education and training to respond to the qualification requirements of electronic commerce

	Experts	**Enterprises**
1. Universities	3,9	3,2
2. Polytechnics	3,9	3,4
3. Basic vocational education	3,0	3,0
4. On-the-job learning systems	3,4	2,3
5. Apprenticeship contract	3,2	3,8
6. Tailored training programmes in an enterprise	3,7	3,4
7. Learning courses outside enterprise	3,0	2,7
8. Virtual or net-based learning	2,8	3,6
9. Mutual training for enterprises in one business sector	3,3	2,7
10. Mutual training for enterprises in different business sectors	3,2	2,9
11. Self-learning of individuals	3,0	3,9

According to the interviewed experts, universities and polytechnics as educational institutions get the highest grades (3,9). On the other hand, basic vocational education gets a weaker grade (3,0). A high grade was given to the tailored training programs, which supports the importance of an enterprise-specific approach to qualification development. Also the systems of on-the-job learning were considered positive, as well as apprenticeship contract learning opportunities. An interesting feature in the results is also that virtual or net-based learning got the worst grade from the experts, which shows some scepticism to this kind of learning method.

From the results of the interviewed experts, it can be interpreted that they regarded the future demand of work force in e-commerce to be targeted mainly to highly-educated persons. It can also be noted that in this respect the ideas of the representatives of enterprises differ quite remarkably from the ideas of the experts. The best grades from the representatives of enterprises were given to self-learning of individuals and apprenticeship contract, and also virtual learning was evaluated higher than in the case of the experts. Moreover, polytechnics and especially universities got considerably weaker grades from the representatives of enterprises than from the interviewed experts. This can be partly explained by the fact that the interviewed enterprises were small, as a result of which they may see their future requirements to be mainly on the highly operative side of their businesses. Besides, the interviewed enterprises were such that they mainly bought the technical expertise required in the development of e-commerce systems from external experts and suppliers, which reduces their need for own highly-educated experts in the field. However, it can be assumed that in larger companies with better possibilities to have their own specialised experts, the situation and consequently also the evaluation results could have been quite different.

7.1.2 Development needs of different levels of education

In the interviews, the experts were also asked to represent ideas and opinions on the changes and development measures that would be needed in different levels of education to better meet the qualification requirements of SMEs in electronic commerce. The question was open, and the suggestions could be related to basically any area, like learning objectives, learning content, practical implementation of education etc.

Four central levels of education in Finland were included in this analysis: primary and secondary education (comprehensive schools and high schools), basic vocational education, polytechnics (universities of applied sciences) and universities. The important development ideas for each of these levels are reported in the following, based on the results of the interviews.

In the case of primary and secondary education (comprehensive school and high school) the experts emphasised the following needs and development areas/topics:

- The meaning of comprehensive basic education, so that the students are provided with sufficient general knowledge and skills in order to promote the development of the economy and society.
- The basic skills of the use of computers and the Internet.
- Infrastructure, hardware, software and networks at schools to enable students to use computer networks and the Internet in basic education.
- The basics of how the society and economy work are important to understand, also emphasising the increasing role of computer technologies and networking.
- Entrepreneurship and the basics of running an enterprise already in the early stages of education.
- A shift from the passive retrieval of information towards creativity and self-expression.
- Development of communication skills, language skills and cultural skills which are needed in the globalising world and international economy.
- Respect of work should be emphasised in education, so that the relatively small-numbered young generations would largely enter the labour markets.
- Respect of the work of teachers should be increased to guarantee the availability of skilled and qualified teachers in the future.

All in all, it was even a bit surprising how much the interviewed experts emphasised the role of comprehensive basic education as a very important factor for the development of the economy and society, and at the same time also electronic commerce. The mutual view of the interviewees was that sufficient resources for the development of primary and secondary education should be guaranteed.

In Finland, the aim of basic vocational education is to advance the development of vocational qualifications, develop the working life and to promote employment. Basic vocational education emphasises professional qualifications and entrepreneurship, but also the promotion of the raising of balanced individuals and member so the society. Also, an aim is to provide opportunities for continuation of studies, and willingness and ability to life-long learning. (Laki ammatillisesta koulutuksesta 21.8.1998/630.) According to the results of the expert interviews, vocational education should pay attention to the following kinds of things to serve the development of qualifications needed by the SMEs in e-commerce:

- Deep knowledge and good skills of work-related information technology.
- Especially in technical education, the understanding of the technological solutions of e-commerce.
- Practical and case-based learning of business and its rules, business concepts, structures and exploitation possibilities of the Internet.
- Entrepreneurship and strengthening cooperation with enterprises and companies.
- On-the-job learning as a part of education.
- Problem solving, communication skills and language skills should be given a sufficient role.
- Although the importance of general qualifications and meta-skills is increasing, the importance of craftsmanship and economic-technical qualifications should not be neglected either.

In basic vocational education, the role of on-the-job learning has been emphasised and increased lately, and it provides students with an opportunity to learn realistic practical work on the spot in working places and real-life work communities. At its best, this can provide significant advantages compared to

learning the same things only within educational institutions. On-the-job learning has been argued to enable a comprehensive experimental learning process, but it requires the creation of meaningful learning prerequisites (c.f. Boud, Cohen & Walker 1993; Ellström 2001; Heikkilä 2006; Kivinen & Silvennoinen 2000; Kivinen et al. 2003; Kolb 1984; Ovaskainen & Ritsilä 2000; Stasz 1998). The successfulness of on-the-job learning in education is hence largely connected to the nature of work tasks that are given to the students and the work processes that these tasks are connected to. The realisation of potentially rich on-the-job learning environment thus requires usually that the students can really participate in the meaningful practices of their work communities (e.g. Ovaskainen & Ritsilä 2000). This can partly also raise the students' motivation, which is also one of the potential positive factors of the system. Overall, in Finland, new kind of more on-the-job learning oriented vocational education that tries to combine theory and practice has been seen as a remarkable step towards increasingly work-oriented education (e.g. Kivinen 1998). At the same time, the aim has been to improve the quality of vocational education, increase the confidence of employers on the level of qualifications provided, and also to improve the image and attractiveness of basic vocational education.

In the development of the Finnish educational system, the role of regional polytechnics (universities of applied sciences) has also been emphasised as a provider of highly-educated but simultaneously practice-oriented labour force to different parts of the country. Since this level of education is also especially familiar to the researcher, it was very interesting to collect the ideas of the experts on the development needs of this level. The expressed main development ideas for polytechnics (universities of applied sciences) can be summarised as follows:

- Practice-oriented education on the practical implementation of e-commerce solutions from the viewpoints of both technology and business.
- Teaching of the understanding of business concepts and business operations.
- All students at polytechnics should be provided with a sufficient understanding of the basics of business and the use of information technology.
- Special studies on e-business that include different analyses of the practical experiences of e-commerce.
- Problem-solving and creative thinking should be emphasised.
- Entrepreneurship and entrepreneurial thinking is a very important topic at this level of education.
- Practical on-the-job learning with learning objectives and suitable links to theories.
- Students should have contacts with enterprises and build personal networks.
- Education of e-commerce should be integrated as a part of other business studies.
- A potential problem in polytechnics can be the lack of qualified and innovative teachers.
- Short courses and adult education are also areas that polytechnics should emphasise to support life-long learning.

The results indicate that the development of e-commerce poses considerable challenges also for polytechnics to serve the needs of SMEs in e-commerce.

There was also seen new and remarkable potential in the cooperation of polytechnics and universities. Also with this in mind, it is interesting to next have a look at the interview-based results on the development needs of university education. The expressed main ideas of the interviewed experts can be summarised in the following way:

- Differing from polytechnics, universities should concentrate more scientific information, and serve their role as producers of objective research information.
- The role of universities is also remarkable in the anticipation of the future trends of e-commerce, as well as the analyses of development needs of related educational and training systems.
- Students should be provided with a wide understanding of the different aspects of e-business, also remembering social aspects.
- Analyses of cause and effect relationships should be emphasised in university education.
- Universities were also expected to provide a deep understanding of the operational and business-technical entity of e-commerce, also at the practical level.
- A central challenge for university education is to develop continuously to guarantee that it is up to date.
- All students, regardless of the field of studies, should be provided with the basic understanding of entrepreneurship, business operations and computer networks.
- Active cooperation with companies and enterprises, e.g. in the form of practical training periods for students, but also for teachers to develop their understanding of e-commerce in practice.
- Possibilities for students to participate in different research and development projects.
- Increasing number of study programs and courses on e-business, as well as professorships etc.
- Projects and courses that cross traditional boundaries between study fields, institutions etc. to increase interaction.
- Universities were also seen to have a growing responsibility in promoting life-long learning.
- A central question also for the universities was seen to be the finding of qualified and motivated teaching personnel. To guarantee this, teaching work should be given more respect, so that often scientifically oriented university experts would not see it as an unpleasant duty.

Overall, the development of electronic commerce challenges the educational system as a whole, and educational institutions are expected to continuously transform themselves, their activities and sharpen their strategic and operational role in the future. For their part, the findings of this study emphasise the need to develop educational and learning strategies and practices that support a balanced development of e-commerce related knowledge and professional capacities (c.f. Foster & Lin 2005, 90). The challenge is demanding, especially since education may have sometimes been expected to provide students with qualifications to act in environments and situations that are often still unpredictable. This situation has for its part led to a growing discussion on the importance of teaching students abilities to learn continuously and innovate in addition to traditional work-specific qualifications (e.g. Remes 1993, 160). Educational institutions and work places have started to increasingly cooperate, which can be seen as an important

phenomenon also supporting the successful development of education that serves the qualification requirements of SMEs in electronic commerce. This kind of objective-oriented cooperation, as well as the continuous questioning of old practices and promotion of new ways of thinking can be seen as significant potential sources of evolution ore even boundary-breaking solutions also in the future.

In the professions of information society, important general qualifications have been reported to be such as critical management and analysis of information, communication skills, interactive skills and social skills (e.g. Nijhof 1998; Ruohotie & Honka 2003; Stasz 1998). Since job-specific skills have to be learned and updated more and more throughout one's career, in the literature it has been suggested that also the emphasis of education should be switched more and more towards these meta-skills and learning to learn (e.g. Kankaanpää 1998; Otala 1996; Ruohotie 2002; Ruohotie & Honka 2003). At the same time, learning methods should also be developed accordingly. Still, the importance of the high-quality learning of different job-specific skills should not be neglected either (e.g. Nijhof 1998, 33). In fact, a number of researches indicate that the persons with very widely and generally structured educational degrees may have a weaker job-specific skill level, and simultaneously weaker professional identity, than the persons with more narrowly focused and job-oriented degrees. On the other hand, this also emphasizes the responsibility of employers in providing opportunities for on-the-job learning of job-specific skills and knowledge (e.g. Haltia & Lemiläinen 1998, 41-42). Here, a significant challenge is then to recognise and reach a consensus on which specific qualifications, skills and competencies are necessary for a particular e-commerce job (or other job).

7.2 Development of qualifications within SMEs

Traditionally, SMEs have typically been argued to be relatively weak in training and other internal qualification development activities. The inhibitors to developing qualifications within SMEs have been found to include costs and funding problems, lack of understanding of the return on qualification development investments, lack of time for the training of the personnel, especially if the training is not directly related to the core business and core tasks (e.g. Barry & Milner 2002; Metsä-Tokela, Tulkki & Tuominen 1998, 226). Lack of qualifications, together with the lack of financial resources and time have also been found as a major obstacle to the development of e-commerce in many Finnish SME' (e.g. Granholm 2001). According to Granholm (2001), a large scale of SMEs reported to have a need for external consultation and training, since they felt to lack the adequate qualifications and skills to develop their e-commerce and e-business solutions. Nevertheless, as analysed also in this study, the development of the Internet and electronic commerce requires

new kinds of qualifications from SMEs, which means that enterprises should take responsibility and action to reskill and train their personnel.

Training can be defined as a planned and systematic effort to modify or develop qualifications, knowledge, skills and attitudes through learning experiences in order to achieve effective performance in an activity or a range of activities. In practice, in enterprises training and working usually must take place in parallel, also interacting with each other. Typically training has been considered as one of the key organisational issues for a successful implementation of new IT-based solutions, which emphasises its importance in the development efforts of e-commerce in SMEs.

As one part of the expert interviews of this study, ideas were collected to support the training of the personnel of the SMEs in electronic commerce. According to the interviewed experts, a central factor is that the management of an enterprise is also committed to the development and it tried to support the multi-dimensional change process that successful e-commerce often requires, and aims to motivate the personnel through leadership. To implement development activities in practice, new systems and practices are typically needed for on-the-job learning. Also educational and training institutions were seen by the interviewed experts to have an important role here as active and flexible providers of different opportunities for (also degree-oriented) tailored adult education for the purposes of SMEs. Different courses were also hoped to be given in workplaces, tailored so that they are as closely as possible linked to the normal work of the personnel. An advantage of this kind of procedure is that the personnel does not have to leave their workplace and be absent from work, which both decreases the expenses of training an the employer and prevents potential income losses of participants. Hereby, the possibilities of SMEs to participate are improved, and time-related problems that often prevent participation decrease. Among the interviewed experts there was also a suggestion that society could partly support this kind of system, although enterprises were also seen responsible for supporting their personnel to participate. Participation in development projects was also seen as a potential way to support learning in workplaces, also in SMEs.

A common idea of the interviewed experts was that it is essential that enterprises understand the need to invest in learning and different kinds of educational and training programs. Here, enterprises were also considered to benefit from cooperation and networking. E.g. mutual training sessions, seminars etc. could be beneficial, and they also provide enterprises with an opportunity to get guidance, share ideas, discuss about different cases etc. Support for learning activities in leisure time was also considered as a potentially remarkable factor to support the learning of the personnel in SMEs. This support could take place e.g. in the form of compensation of the costs of acquiring a home PC, using the Internet etc. Overall, it was seen important to increase the personnel's knowledge and understanding of e-commerce opportunities, to develop positive attitudes towards the use of electronic

networks, to motivate continuous learning, and to develop a creative learning atmosphere.

Another topic that was included in the interviews was also discussion on how the development of e-commerce in SMEs could be best supported by the public sector and its activities. Especially in the case of very small enterprises, public support was seen as an important factor to help a successful start-up and also the potential integration of e-commerce as a value adding part of overall business. However, it was emphasised by the interviewed experts that the "motor" of development should always be the internal motivation of an enterprise. Overall, according to the interviewed experts, the best ways of public support for the development of electronic commerce and the development of related qualifications in SMEs were the following:

- Development of training and education both at a general industry-specific level.
- Development of tailored training opportunities for SMEs.
- Direct support for training and education of the personnel.
- Public support for the development of networks and electronic infrastructure.
- Partial grants for investments and development projects in e-business.
- Continuous support and guidance system especially targeted to SMEs, information/service points etc.
- Support for networking of enterprises, also public net forums and portals to promote sharing of ideas.
- Support for international marketing and development of international activities.

Right kind of public support was hence seen reasonable, but according to the common view of the experts, the markets should still be given the power to decide what kind of business is profitable in the long run. Thus, it was emphasised that public support should not distort healthy competition. On the demand side, in turn, public measures were seen important in eliminating the risk of a part of citizens to be excluded from the development of the information society (c.f. Tynjälä 2003). Thereby, the public sector was expected to play an important role in giving an opportunity to use the Internet and hence also Internet-based e-commerce services to as many Finns as possible.

Interestingly, the views of the interviewed representatives of enterprises about how the public sector could support the development of electronic commerce of SMEs were largely in the same line with the ideas of the experts. Different kinds of development projects, financing opportunities for the start-up costs of electronic commerce activities and active informing of support opportunities and educational opportunities were highlighted as recommended and preferable activities (c.f. Chapman et al. 2000). Additionally, also enterprises wished the society to provide support for the use of the Internet to citizens, and a good Internet infrastructure to all regions in Finland. On the other hand, still, those enterprises that were also involved in traditional commerce wondered why Internet-based e-commerce should get extra support compared to other forms of commerce.

In terms of e-commerce related learning, the ideas of the representatives of enterprises emphasised even surprisingly much the importance of high-quality

institutional education, since it was seen as an important source of the future e-commerce qualified workforce. Still, the majority of enterprises also thought that they would find tailored training on e-commerce beneficial. This was also seen to potentially help to integrate the industry-specific experience and knowledge of the personnel with the new knowledge on Internet-based e-commerce. The enterprises also had good experiences on development projects, which they had had together with experts and educational institutions. In addition, on-the-job learning periods of students were seen as a potential way for small enterprises to get young persons that understand new business potential in their use. Overall, like the experts, the representatives of the enterprises thought that the support of the society can be very important for small enterprises that do not otherwise often have the resources to systematically prepare their personnel for e-commerce activities. Supported also by international research results, it can also be argued that SME-oriented e-commerce development initiatives should have a sufficiently targeted approach, since those activities have been found more successful and effective than very widely directed ones (Stockdale & Standing 2006, 387).

In the first round of interviews, both the experts and the representatives of enterprises were also asked to assess by a five-point ordinal rating scale (5 = very well -> 1 = very badly), how well different potential ways to acquire e-commerce knowledge and skills meet the needs of SMEs. Table 9 reports the means of the answers of both groups, and other statistical indicators are reported in Appendix 8.

TABLE 9 Suitability of different ways to acquire electronic commerce knowledge and skills for SMEs

	Experts	**Enterprises**
1. Recruitment of new qualified personnel	4,1	3,8
2. Training of existing personnel	3,8	4,0
3. Buying of specialised services	3,8	3,9
4. Individual learning of employees	3,2	3,9
5. Cooperation projects with different institutions	3,4	3,0
6. Use of students as sources of new knowledge	3,2	2,9
7. Support from enterprise unions	2,4	3,0
8. Cooperation with customers	3,9	3,5
9. Cooperation with other enterprises	3,6	3,6
10. Cooperation with international cooperative partners	3,9	3,3
11. Cooperation with experts	4,0	3,7
12. Use of consultants	3,6	2,7

In the answers of the experts, the best ways were considered to be the recruitment of new qualified personnel, as well as cooperation with experts, international business partners, other enterprises and also customers. The use of consultants also got a remarkably higher grading from the experts than from the representatives of enterprises. On the other hand, cooperation with enterprise unions got on the average the lowest score from the experts.

In turn, the interviewed representatives of enterprises considered training of personnel, individual learning of employees, buying of specialised services, and also recruitment of new personnel, and cooperation with experts to be the most suitable ways to acquire new e-commerce knowledge and skills to their enterprises. Suggested ways to partly overcome the lack of knowledge, skills and qualifications also included the idea of e.g. industry associations to disseminate information and organise seminars for SMEs with a special focus on them and their particular needs etc. (c.f. Lawson et al. 2003, 273). Expressed ideas further included information centres of electronic commerce resources specifically for SMEs, information briefings at a regional level, as well as one-stop service points for the information on e-commerce, and also e-business in a wider meaning. Backed up by earlier research results, it could be commented here again that support and advice to SMEs should be specific enough, and to address the individual needs of a SME. Similarly, also the published information should not be too generic in nature in order to meet its aims. (Stockdale & Standing 2006, 388-389.)

There are interesting differences in the answers of the experts and the representatives of enterprises. From the answers of the enterprises, it can be reflected that the interviewed enterprises are small, and the need for the development of qualifications and knowledge of the existing personnel is emphasised, since the possibilities to recruit new e-commerce specialised personnel are considered very limited. Still, despite some differences, both groups of the interviewees found all of the presented ways reasonable and to have a potential role in their e-commerce related qualification development. In the interviews, the different ways were thus also seen complementary. In addition to the listed ways, the experts also mentioned seminars and congresses, studying abroad, brave piloting and experiments, and learning through trial and error, together with benchmarking, as potentially important ways for the internal development of their qualifications in e-commerce.

In general, the development of qualifications and abilities to learn is a rising factors in safeguarding the competitiveness of businesses in the future (e.g. Otala 1996; Varila 1992). Simultaneously, the competition for high-quality professionals seems to be getting harder and also more international, especially in the long run. To promote their future success potential, Finnish enterprises should be able to connect the development of learning as a part of their overall strategies and set clear and purposeful goals for the development of the critical qualifications of their businesses (c.f. Mäkelin 1998). Learning and development of qualifications and competencies can be considered as a key success factor for both enterprises and individuals. A very important role is played by an enterprise's ability to manage and lead individuals and their qualifications, competencies, and activities, and to motivate them to develop themselves (e.g. Argyris & Schön 1996; Senge 1994). For people in work communities, learning typically means either the renewal of existing ways of doing things or adaptation to completely new ways of doing one's own work. From the viewpoint of learning at the organisational level, it would be essential to

promote structures and factors that could direct the actions and learning of individuals to support the success of an enterprise as an entity (e.g. Ellström 2001). Thus, people in an enterprise could learn and develop together towards the direction that is desirable and has been determined in the vision of an enterprise. Learning at the organisational level can hence be described as a process with many phases, which proceeds as an interactive spiral between the individual level and at the organisational level, and which is supported by management and leadership (c.f. Moilanen 2001; Senge 1994).

It can also be argued that in the changing environment, enterprises should especially concentrate on the long-term development of their core competencies (Hamel & Prahalad 1990; Hamel 2002). Here, a remarkable tool may be tailored, enterprise-specific personnel training where central elements of core competence - knowledge, skills, but also values and attitudes – can be discussed and developed. Suitable training processes may also help and encourage personnel to create new visions for the future, develop ideas for new ways of doing things, find new solutions etc. Training can thereby also help to build new culture in an enterprise, seek for renewals and question old routines. Thus, it can be argued that SMEs in electronic commerce should take the development of training seriously and invest in the planning and implementation of successful training activities and programmes (c.f. Barry & Milner 2002).

7.3 Anticipation of qualification requirements and development of electronic commerce

In the interviews, it was also examined what potential ideas the interviewed experts and the representatives of enterprises have about the development of the anticipation of qualification requirements and development of electronic commerce. First of all, anticipation was unanimously found necessary. Still, especially in many answers of the representatives of enterprises, it was also stressed that the anticipation systems should not be too hard and demanding, and they should benefit the enterprises concretely.

The interviewees saw a need for both wide overall analyses and very specific and detailed sector-based and industrial analyses. It was also hoped that these could be combined and presented together in a same material set. Demand side (customers) was also suggested as an important source of anticipation information, together with the supply side. Methodological development in anticipation was also requested, and the most popular answers among the suggestions for appropriate anticipation methods were the following:

- Interviews of entrepreneurs and experts.
- Continuous surveys.
- Discussion forums and specialised net forums.
- Benchmarking projects, finding of good practices.

- Detailed international comparisons.
- Questionnaires to graduated students about their experiences on how their studies match to the needs of working life
- Special scenario work groups.
- Reliable statistics and time series of quantitative and also qualitative development of e-commerce and market expectations.
- Finance for research on e-commerce from different perspectives.

Further, the interviewees were also asked about their ideas on the need and potential for a network-based anticipation system on the future of electronic commerce. This idea also partly follows the suggestion of Stockdale & Standing (2006) to have enterprises and a range of stakeholders (including business associations, educational institutions and decision makers) disseminating information, guidance and help through different channels, and also planning and implementing appropriate training and other activities to develop e-commerce "champions".

The interviewees considered that there could be a potential need for this kind of system, but the practical implementation of it was seen difficult. A central problem was seen to be how to make busy experts and entrepreneurs to commit themselves to this kind of system. Another important question left open was also the coordination responsibility of the system. It was mentioned that the system could have the best success potential if it was not implemented as any separate project but rather integrated into some other forum or coalition. All in all, though the experts were unanimous on the need for anticipation, rather pessimistic views were presented about the implementation possibilities of a collective anticipation system. There were also doubts about the willingness of enterprises to cooperate in anticipation in a field like electronic commerce, where the understanding of the future development trends can be seen as a central success factor.

8 DISCUSSION AND CONCLUDING REMARKS

This study has concentrated on analyses of qualification requirements of SMEs in electronic commerce. In its complementary parts, it approached the research phenomenon from a number of approaches in order to provide answers to the chosen research questions. Further, the study has also attempted to find out ways to respond to development challenges, i.e. respond to the question of how SMEs could be supported to acquire the required qualifications.

This study has tackled a multifaceted set of important topics with an aim to provide new scientific research information combined with a practical development orientation. Rapid development of information and network technologies has enabled the rise of new business opportunities, sometimes even called "the new economy" (e.g. Ali-Yrkkö et al. 2001; Gordon 2000; Kolehmainen 2004; Tse & Soufani 2003). This has also been shaping, in some cases even shaking, traditional ways of doing commerce. Although the first electronic commerce hype of the late 1990´s and early 2000's has passed by, e-commerce has grown steadily, and it has spread continuously both in terms of sales volumes, turnover, ranges of products and services, and the overall economic influence. New completely e-commerce-based businesses have also emerged, providing potential customers with new shopping alternatives and challenging the existing players in both B-to-C and B-to-B markets. At the same time, new opportunities and also new kind of competition has encouraged, and partly forced, a constantly growing number of traditional SMEs to rethink their commercial actions and the role of electronic commerce in their business entity. Simultaneously, a rising need has risen to pay attention to the development of required qualifications in SMEs to maintain their competence, to tackle new opportunities and meet new challenges of e-commerce. Still, little research has been conducted on the topic of qualification requirements in electronic commerce, especially from the viewpoint of SMEs.

The study has attempted to contribute to the discussion on the development of qualification requirements of e-commerce, especially in SMEs. The study was constructed by the logic where electronic commerce was the context, where the main research phenomenon, i.e. qualification requirements, was analysed. These analyses were conducted by an approach that was based

on futures research orientation and the applied use of the Delphi method. The aim was to provide a new combination of methods and research topics to enable border-breaking insights with both scientific and practical relevance. The construction of the relatively multifaceted, complex and ambitious research setting has been summarised in Figure 11, which presents a combined illustration of the main elements of the conducted study.

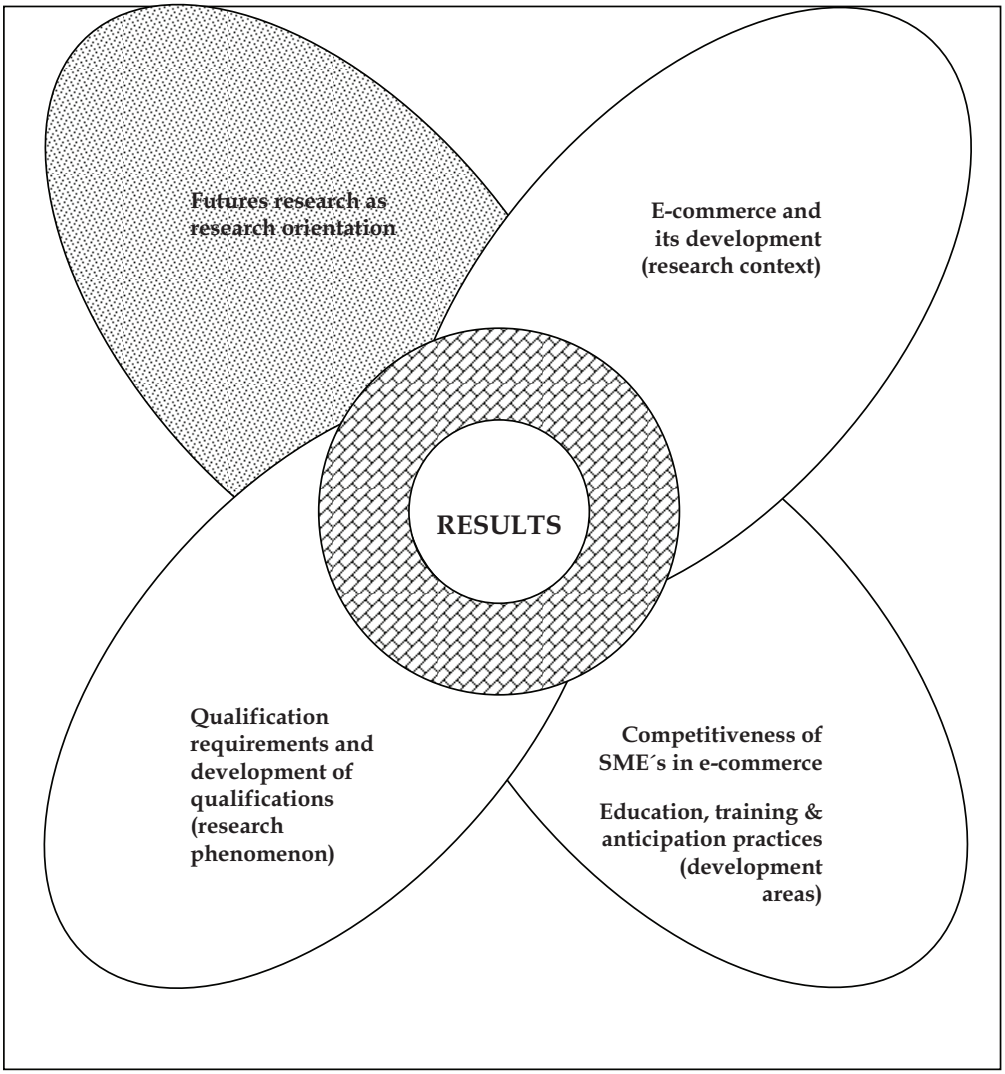

FIGURE 11 Illustration of the main elements of the conducted study

The presented combination of the chosen research phenomenon, research context and the chosen research orientation can be considered as unique, and very similar research has not been conducted in Finland, or elsewhere in the

world. There is research on the skills needs in information technology sector, but the qualification requirements in e-commerce have not been studied in a systematic manner, especially not from the viewpoint of SMEs. Overall, despite a growing interest, there is still relatively little research aiming to serve the development of competitiveness of SMEs in e-commerce, especially from the aspects of human resource or qualification development. In addition, despite a grown concern on the topic in Finland, there does not seem to be systematic analysis on the development needs of education and training in these fields either. Additionally, it can also be argued that there is still a need to produce more research-based information on the development of anticipation practices, and particularly also self-anticipation skills in enterprises, so that the future qualification requirements in e-commerce could be recognised and action could be taken to meet them.

This study aimed to tackle the above mentioned themes with a number of new approaches, which is also a source of uniqueness in this study. On the other hand, this may increase the value of the research and its results, but on the other hand it also emphasises the need for a critical look at the research process and the validity and reliability of the results. This chapter aims to combine and discuss the major contributions of the study, and also critically assess the study and its results.

8.1 Discussion and conclusions on research findings

The analyses of the qualification requirements of electronic commerce in this study were based on a systematic, thematic division of qualifications, which was constructed from business-functional approach. Under the selected themes, a considerable number of central qualification areas were analysed based on the interviews of both experts and representatives of enterprises. In terms of e-commerce related functions, the used classification of qualifications was found relevant and quite comprehensive by the interviewees. Potential additional important qualification areas that the interviewees suggested were mainly related to overprofessional or general qualifications. These included the understanding of cultural differences, cooperative skills and networking skills, as well as the ability and willingness to follow the developments and learn continually.

From the conducted quantitative and qualitative analyses of qualifications, a number of interesting findings were made. Among the most important of them can be said to be the following:

- In electronic commerce, business related qualifications seem to be emphasised in addition to, and even to a greater extent than, technical qualifications.
- Comprehensive understanding of business and the qualifications related to the management of integrated and complex business entities were emphasised as very significant qualifications of successful electronic commerce of SMEs.

- There seems to be a growing demand for the ability to combine business qualifications and technical qualifications in a value adding way.
- Simultaneously with a growing demand for overprofessional qualifications, there also seems to be a demand for very specific and detailed qualifications in special areas (like information security). On the other hand, these qualifications may also be acquired by the use of outsourced services.

Both SMEs and larger companies are typically still learning the requirements of evolving e-commerce environment. The situation of large companies is easier in the sense that they have bigger resources, and consequently also more possibilities to hire specialised personnel also for e-commerce activities. Also for them, however, a challenge remains to make individuals of possibly very narrowly defined areas of responsibility to work fruitfully together for common goals in e-commerce. Thus, successful management of their business entities can be seen as a demanding challenge for them. Additionally, regardless of the size of a firm, qualifications of marketing and strategic development are important for making profitable business and tackling potential opportunities. For the development of qualifications at a mutual level, it is also important to have an organisational culture that promotes the development of qualifications and competencies and encourages sharing of experiences (e.g. Ellström 1998; Ellström 2001; Kanter 2001; Senge 1994). This could help enterprises to build well-functioning and innovative entities, where individuals support one another with their qualifications and help to develop added value to customers.

Education and training can be seen as a very important part of human resource management in enterprises, and they can support enterprises to continuously develop the qualifications and competencies needed for the achievement of their business goals (e.g. Otala 1996; Määttä 2000). At best, education and training can both provide qualifications, knowledge and skills, but also increase work motivation and encourage life-long learning (c.f. Nijhof 1998). According to the results of this study, both the interviewed experts and the representatives of enterprises valued the role of Finnish educational system as an important provider of qualifications that they found significant for a successful e-commerce. Still, relevant training and other activities would also be needed to enable the development of required qualifications within enterprises, but the challenge of how to organise these activities in the best possible ways remains. Anyway, what was emphasised in the interviews was a sufficiently sector or even enterprise specific approach to training and other development activities, since these activities were considered more motivating and effective than the ones with a very wide or general content.

Both training and the anticipation of the qualifications of SMEs in electronic commerce is problematic also due to the fact that in Finland and elsewhere there is a large number of enterprises and companies that are different in terms of size, business sector and strategy (c.f. Berg et al. 1999; Tuunainen 1999). As a result, the qualification requirements and development needs can vary significantly case by case. Therefore, in addition to producing anticipation information at a general level, enterprise and industry specific approaches would be needed also in anticipation. To be able to anticipate and

meet future oriented needs, cooperation between different parties (enterprises and companies, educational institutions, authorities etc.) would also be beneficial. Like e-commerce itself, the anticipation of it qualification requirements can thus be seen as a continuous and long-term development process. Both require a lot of work, the final results of which can often be seen only in a longer run.

8.2 Contributions of the thesis

As a result of the earlier defined research objectives, this study has attempted to contribute both to the development of theoretical and scientific understanding of the chosen research topics, but also to the practical development of qualifications and e-commerce activities in SMEs. Further, one aim has been to support the development of educational, training and other activities to meet the qualification requirements in SMEs. Accordingly, the major contributions of this study can be divided to three categories: theoretical and scientific contribution, practical contribution to SMEs and their development, and practical contribution to the development of education and training activities. All these kinds of contributions are presented and discussed in the following sections.

Theoretical and scientific contribution

Although this study has also had a relatively strong practical orientation, there is also a set of factors that emphasise its theoretical and scientific contribution as well. First, this study has a uniquely structured multidisciplinary approach with an aim to provide new information as a cross-section of different research areas that have not traditionally covered together in a single research. Thereby, the study attempts to provide new perspectives that apply and combine theoretical, as well as practical, ideas both from business economics and educational sciences. With a strong SME orientation, this study is set in the field of small business development and entrepreneurship, which is a rich and multidisciplinary area of research with a high relevance for the development of economy and society. Still, this kind of multidisciplinary research is relatively small in number, partly also because it has not always been very highly respected, although it can be argued to be increasingly needed to break traditional boundaries and find new openings to analyse the often multifaceted and complex questions of changing environment. These questions cannot always be tackled only by sticking to the traditional categorisations of the fields and areas of science.

Second, this study provides a new and demanding combination of a research phenomenon and a research context. Especially since the late 1990's, electronic commerce and its development has been under grown research, and also SMEs have been included as research units in a number of analyses (e.g. Barry & Milner 2002; Eriksson, Hultman & Naldi 2008; Jones, Hecker & Holland

2003, Kargozoglu & Lindell 2004; Lawson et al. 2003; Poon & Swatman 1997; Ramsey et al. 2003; Scupola 2008; Stockdale & Standing 2006; Tuunainen 1999; Zhu, Kraemer & Xu 2003). Still, despite the growing importance of intangible assets as economic success factors, there has not been much research concentrating on the viewpoints of human resource development of SMEs in e-commerce. The chosen research phenomenon, i.e. qualification requirements, is challenging by its theoretical background, since the concept is not unambiguous and also relatively abstract by nature. Also for the chosen research context, i.e. electronic commerce, it was not easy to find a solid theoretical basis to construct this study on. Electronic commerce as a concept is still relatively new and it is under continuous development, which caused additional problems from the viewpoint of finding an approach that would be relevant and accurate for the purposes of this study.

The research process of this study has included a number of necessary choices. An important one has been to approach the qualification requirements especially at the level of enterprises as developing business entities, instead of concentrating especially on individuals and their requirements. This is a relatively new approach in the area of qualification research, although the viewpoint of mutual qualifications has been increasingly emphasised in literature. Also, this thesis introduces one attempt to operationalise and categorise the different areas of qualification requirements of SMEs in electronic commerce. Although some of the choices here could be criticised in terms of theoretical basis, the choices had to be made to develop an implementable construction for the empirical analyses of qualification requirements and get the research process forward. The choices were also not made by the researcher alone, but they were based on discussions with experts, and at that particular moment of time they were mutually seen appropriate from the viewpoint of this study and its aims.

Third, this thesis provides an attempt to apply the principles, practices and methods of futures research in a new setting. Also in Finland, the interest in futures research has been growing recently, and it has been used as an approach in different kinds of research projects, as well as anticipatory development reports (e.g. Aaltonen & Wilenius 2002; Ahola & Palkamo 2009; Hernesniemi 2000; Kaivo-oja & Kuusi 1999; Mannermaa (toim.) 2000; Ritsilä 1999; Stenvall 2001). This study contributes also to this area, and it has aimed to apply an applied version of Delphi research technique in a new framework, i.e. research on the qualification requirements of SMEs in electronic commerce.

Overall, the theoretical contributions of this study can be summarised to be related to the facts that it provides new interdisciplinary approaches, and anything exactly similar has not been conducted before. This has a potential to raise the scientific and theoretical contribution, but on the other hand it means that the choices of this study can be put under careful criticism. Admittedly, in terms of depth, the theoretical part of this thesis may have partly suffered from a relatively practically oriented starting point and a variety of multidisciplinary topics. Thus, the theoretical background of this thesis study could have been

more focused and further developed in that particular area, if the objectives were more narrowly defined. In that case, perhaps the methodological setting could also have been even more carefully constructed based on a certain theoretical background.

On the other hand, when judging the construction of the theoretical background, it should also be remembered that e.g. electronic commerce is such a new research topic that there is not any one particular theory to follow, and its theoretical foundations are still relatively weakly constructed compared to many more traditional research topics. Also the theoretical foundations of the chosen qualification requirements in the conducted analyses could be criticised as potentially inconclusive, or also theoretically relatively vague and inexact. This kind of criticism is justified in the sense that the constructed classification of qualification requirements could not be directly based on any earlier idea, due to the fact that research on the chosen topic in the chosen context did not exist. Still, the chosen classification of areas of qualifications was developed in cooperation with a small number of experts, and it was also found relevant in the conducted interviews. This, for its part, speaks in favour of the argument that the classification worked and can be seen purposeful for the objectives of this study. What was seen especially useful by the interviewees, was that the analyses of e-commerce and qualification requirements did not concentrate mainly (or only) on the technical side, but business-related aspects were given a sufficient role. Despite certain weaknesses, it could thus be argued that the developed research setting with the chosen combination of quantitative and qualitative analyses was able to produce relevant and interesting information both to academics, and also to SMEs and educational institutes that can be seen as major beneficiaries of the results. Thus, it can be argued that the chosen setting fulfilled its role and it can be said that the study achieved its major objectives. Further, it may also provide ideas for further research with new research settings.

Practical contribution to SMEs in electronic commerce and the development of their qualifications

As indicated earlier in this thesis, SMEs have a very significant role in the development of economic activity and prosperity in Finland (e.g. Littunen 1998; Suomen Yrittäjät 2009; c.f. Storey 1999). Since the economic role of electronic commerce has been growing, and it is expected to grow further in the future, a relevant use of e-commerce opportunities may play a substantial role for the development of an increasing number of SMEs.

Especially in B-to-B markets, the benefits of e-commerce have already started to realise in a larger scale, and there are good examples of remarkable cost savings by renewed commerce processes and value chains. In B-to-C markets, the growth of e-commerce and its demand has often required more patience, but e-commerce has started to play a continuously growing role also there. This together with the fact that the use of information networks is becoming an increasingly natural part of lives makes it justified to anticipate

that e-commerce may become an essential and necessary part of offerings also for a constantly increasing part of traditional commercial enterprises.

Just like in any other business, also in e-commerce, enterprises should be able to provide their customers with a higher level of added value – e.g.in the form of relevant combinations of better products, better prices, service, shopping experience, reliability etc. - than their competitors. This also requires a number of qualifications, related both to the understanding of customers and their behaviour and expectations, as well as the understanding of business processes and the development of related support systems and practices by the help of technical opportunities of e-commerce. Despite there have been developments in enterprises' e-commerce offerings also as a result of learning, there are still several areas that could often be improved, including product delivery issues, security and trust issues, potential multichannel coordination, product presentations in Internet sites etc. All these, and a number of other, areas also provide enterprises with opportunities to achieve positive customer-oriented differentiation. Nevertheless, success also often seems to require sufficient reliability and recognition, which may favour large companies with a well-known brand at the expense of smaller enterprises.

The development of e-commerce in an enterprise can be seen as a dynamic learning and development process, where different phases follow one another. To develop their e-commerce offerings to a high level, enterprises should possess or acquire sufficient qualifications in one way or the other. Nevertheless, it is also important to emphasise that the development of e-commerce solutions should be related to the overall strategy and the role of e-commerce in the business of an enterprise. Still, regardless of the choice of the desired e-commerce development level, a needed amount of qualifications can be seen as a necessary prerequisite for the planning and implementation of successful long-term e-commerce activities.

This study has aimed to provide SMEs with information on a set of different qualifications required in e-commerce. By its categorised approach, the thesis has also been able to have a multisided look at different areas of qualifications. The results emphasise the need to understand the role of business-related qualifications, and thus this study argues that the sometimes presented idea of e-commerce as an area with mainly IT qualification requirements is typically wrong. SMEs should remember that despite their undeniable importance, IT qualifications are not sufficient alone, but on the contrary, the results of this study indicate that different qualifications on the business-side can typically be even more important. A central question for enterprises is then how to integrate business and technical solutions to best support their overall strategies and objectives. Without a deep understanding of the role of e-commerce in its business, there is a risk that an enterprise ends up like "a ship with no direction adrift on e-commerce ocean". The lack of business-related qualifications may hence seriously jeopardise the achievement of potential e-commerce benefits and increase the risk of inability to gain from investments.

A challenge is how SMEs could develop their qualifications at the level of individuals and entities at the same time, so that these risks could be avoided. Still, a potentially worrying finding of this study, in line also with a number of earlier researches, is that many SMEs still do not seem to have a clearly defined e-commerce strategy, or they have not defined the objectives or the role of e-commerce in their business. Naturally, this also problematises the development of sustainable e-commerce solutions and related qualifications. Also rightly-targeted public sector activities could be potentially helpful to improve this situation, but they should be carefully targeted to meet the special requirements of each enterprise.

An important result of this thesis is also that SMEs in e-commerce would appreciate to have persons with a deep business understanding, but simultaneously good skills in computer and network technologies. This is a very challenging combination of qualifications, especially for an individual person working for a SME. This raises the importance of developing the qualifications of enterprises as entities, so that they could figure out how to combine the existing qualifications, and also to develop qualifications mutually following the idea of a learning organisation (c.f. Senge 1994; Soini, Rauste-Von Wright & Pyhältö 2003). On the other hand, another important question is to decide which qualifications should be available within an enterprise, and accordingly also which qualification areas would be more beneficial to acquire from outsourced service providers. Still, there are potential resource, dependency and other problems and barriers that hinder outsourcing of in SMEs, even if it could otherwise be a viable solution to acquire special qualifications, e.g. for the technical parts of e-commerce solutions. Also, a result of this study was that technical qualifications of e-commerce were usually considered easier to acquire by outsourced solutions than more business-related qualifications.

According to this study and some earlier findings (e.g. Berg, Karttunen & Rajahonka 1999; Berg 2004; Granholm 2001; Tuunainen 1999), Finnish SMEs vary considerably in terms of their attitudes and the implementation of e-commerce solutions. Still, a growing number of enterprises in diverse business sectors have decided to tackle the opportunities and meet the challenges, and started their e-commerce operations. This study has aimed to provide information to them in their e-commerce development, also paying attention to the diversity of SMEs. Although this study has mostly included analyses and discussion on the development challenges of SMEs at quite a general level, there are also particular viewpoints concentrating on certain kinds of SMEs in terms of markets, development stage of their overall business and/or e-commerce activities, as well as industry or business sector etc. The study may thus also serve as a kind of first information source on certain case-specific requirements, although this is an area that should be taken further in the future research. Anyway, the feedback from the interviewed enterprises also indicates that in addition to more general information, there would be a growing demand for specific information concentrating on a certain industry, market etc.

Despite a number of positive findings and typically forward-looking attitudes of the interviewed enterprises, this study suggests that there are still constraints in the development of e-commerce and its qualifications in SMEs. These include traditional resource-related problems, which also cause reluctance of SMEs to raise e-commerce development stage and invest in the development of related qualifications (c.f. Barry & Milner 2002). Other factors that hinder e-commerce development in SMEs seem to include uncertainty of market developments, and also doubts on customers' willingness to change their traditional and potentially well-established buying habits. Hopefully, this study and its information of e-commerce and its qualification requirements may get some entrepreneurs and small business owners to rethink and evaluate the alternatives, and potentially reconsider their e-commerce opportunities. Potentially, the biggest beneficiaries of e-commerce may be those new e-commerce specialised traders that have been able to develop an attractive value-adding concept, but also those traditional enterprises that are able to transfer the supply of their products and brands into the new environment, and thus to revitalise or support their business concepts and earlier offerings by e-commerce solutions.

In addition to providing SMEs with useful information on electronic commerce and its qualification requirements, an aim was also to map out ways and methods for enterprises to anticipate qualification requirements themselves. It turned out difficult to find unambiguous answers or solutions to this question. As it could be expected, SMEs had not thought about these questions carefully, and typically they did not have a clearly defined understanding of what the potential ways or methods could be. Overall, it was slightly worrying, although not very surprising, that often there did not seem to be any systematic qualification mapping or development practices, or even strategies, that enterprises followed, and this turned out as an area with a lot of improvement potential. Actually, the content of this study also partly suffered from the fact that the interviewed enterprises typically did not seem to have a detailed idea of their qualification requirements, and consequently they also had not systematically thought about how to analyse, anticipate or develop them. In a sense, this was not surprising, since especially in SMEs, planning is typically quite short term oriented, and they concentrate more on daily operations. Still, an important question is, whether it causes problems if enterprises do not have time and skills to think about future visions, or to anticipate the development of e-commerce or other important issues affecting their businesses. For its part, this study has attempted to raise awareness of the importance of these activities.

Despite the partial lack of these activities in enterprises, the results of this thesis included a number of interesting suggestions for practical anticipation methods or activities. Among these were a number of ideas varying from own active follow-up of development trends to potential specific net-based publications, information sharing networks and discussion forums. There were also suggestions that the public sector could play an active role in setting up

these activities, and thereby support especially SMEs and their e-commerce development. There was also a consensus, especially among the representatives of enterprises, that anticipation methods and activities should be relatively simple and sufficiently practice-oriented, if they were really expected to become widely utilised in small enterprises. It can be expected that these ideas are beneficial both to SMEs and also to public sector authorities who aim to support SMEs by support schemes, programmes and other actions.

Practical contribution to education and training activities

Central instruments to develop required qualifications are education and training in different forms. To respond to changing educational needs, and also to help SMEs to meet their qualification requirements in electronic commerce, educational institutes, systems and programmes should find solutions to the challenges of renewal ability and flexibility (c.f. Achtenhagen 1998). Consequently, this study also included a part, which specifically aimed to provide answers to educational and training questions. The results of this part have already raised interest, and both educational authorities and representatives of different institutes have considered them potentially helpful and valuable.

It has been internationally recognised that students should be taught business related disciplines to understand how electronic commerce could achieve its potential benefits (e.g. Parker & Swatman 2001). This idea is in line with the findings of this study, and again strongly emphasises the idea that successful e-commerce cannot be built based on the development of technical qualifications alone. Then, a challenging question is, for example, how potential e-commerce oriented study programmes should be constructed, what would be the right balance between different disciplines and subjects etc. As a remarkable part, this study provided information for the development of different levels of education in Finland. One finding here is that the importance of business, marketing and entrepreneurship studies was considered significant at all levels, and probably they should be emphasised in the education of future e-commerce professionals.

In addition to the subjects and content of studies, another important question is learning methods and practical arrangements of education and training. A special challenge here could be the development of sufficiently practically-oriented approaches to e-commerce education, including the use of simulation models, practical cases, developmental learning projects etc. (c.f. Parker & Swatman 2001). The results of this study provide a number of new ideas especially for the purposes of Finnish educational system, which can be considered as a major contribution from the viewpoint of practical relevance of the study. As a representative of educational sector, the researcher hopes that the study and its results are able to raise new development ideas and encourage new openings in education. Unfortunately, there are also a number of threats, including a potential lack of qualified teachers, but anyway the development of

high-quality education can be seen as a central element for the provision of qualified e-commerce personnel for SMEs.

In addition to degree-oriented education, a significant role in the development of qualifications is played by different training systems, as well as enterprise-specific learning opportunities and on-the-job learning (c.f. Barry & Milner 2002). The importance of these questions has also been underlined in policy linings, where training has been pointed out as a priority to meet the challenges of "the new economy". The analyses of this thesis contribute to the understanding of qualification requirements, and thereby may help e.g. to map out the gaps between existing and required qualifications, and to develop the understanding of training and learning needs. Here, the importance of enterprise-specific interests and needs should be emphasised, since otherwise there is a risk that remarkable resources are spent on standard solutions that may have little relevance and cannot respond to the particular requirements and priorities of different SMEs.

Overall, the development of electronic commerce puts pressure on traditional education and training systems, as well as enterprises trying to respond to changing requirements and challenges. Despite the fact that this study has concentrated on the qualification requirements of enterprises as entities, individuals and their learning ability is also of high importance. As the development of e-commerce, and other new topics, sets new requirements to individuals as learners, there is a threat of increasing division of individuals to "winners" and "losers" according to their learning ability and motivation (c.f. Castells 1996; Kivinen et al. 2003; Tynjälä 2003). In Finland, there are good opportunities to develop the skills and knowledge of information society, including public computer network connections, courses and other activities to learn the utilisation of computer networks, development programs and projects both at the local, regional, and national level etc. (e.g. Castells & Himanen 2001). These are important resources and activities, and the relevance of them was also supported by the analyses of this study.

All in all, it can be strongly argued that the development needs of education and training systems are an actual and serious question for e-commerce of SMEs in Finland. This study included suggestions, and hopefully also raised important questions, which can support these purposes. Unless enterprises are able to meet the qualification requirements both in quantitative and qualitative terms, the development of e-commerce in Finland can be feared to be threatened, and the risk of losing of e-commerce activities and jobs to other countries increases in global competition. To support the future success potential, attention should also be paid to entrepreneurship education and training, since it can be a good source of potentially successful e-commerce start-ups, as well as new developers for the purposes of existing SMEs that would like to renew and potentially revitalise their businesses by the help of e-commerce.

8.3 Critical evaluation of the study

The chosen research questions and the aims of this study had a strong influence on the construction of the research setting, and also the practical implementation of the research process. As explained earlier, the multidisciplinary nature of the study, and an attempt to combine different kinds of elements together in a new way have also been significant characteristics of this study and its approach. The chosen combination of research phenomenon (qualification requirements), research context (electronic commerce), methodological orientation (futures research) and utilised research method (an application of the Delphi technique) is also unique, which has made the construction of the study challenging.

In this section, the aim is to critically assess this study from the viewpoint of some commonly accepted criteria for good research, including reliability, validity, and relevance. Since this study has been constructed based on a combination of quantitative and qualitative approaches, and qualitative aspects have been in a significant role, the criteria should also be evaluated and discussed accordingly.

Reliability

When assessing the reliability of the research conducted in this study, it should be done with the chosen research setting in mind. From the start of the research process and the construction of the research setting, it was e.g. deliberately decided not to use statistical analyses, which many traditional tests and criteria of reliability are largely based on. Concepts like reliability, and also validity, in their traditional meaning thus serve well in statistically oriented quantitative research, but are more difficult to interpret in the cases of more qualitative research settings.

Reliability can be defined to refer to the degree of consistency of research if it was conducted by different researchers or observers at different times. This also refers to the concept of reproducibility, which originally means that a study should be able to be replicated through the use of either the same or alternative research process, which would give credibility to the original findings. Still, in social sciences, it is commonly accepted that reproducing is typically extremely difficult, since it is often practically impossible to replicate the original data collecting conditions or to control all the variables that could potentially affect the findings (Strauss & Corbin 1998, 266).

Overall, the reliability of qualitative research should hence be assessed according to different criteria than quantitative research based on statistical methods. Lincoln & Guba (1985) have defined trackability of research as a main criterion of the reliability of research. Related to this, they emphasise the importance of auditing and documentation of a research process so that other researchers can assess it. Hereby, reproducibility can be applied to qualitative research, referring to the idea that given the same theoretical perspective of the

original researcher, following the same general rules for data gathering and analysis, and assuming a similar set of conditions, other researchers should be able to come up with either the same of a very similar theoretical explanation about the phenomenon under investigation (Strauss & Corbin 1998, 266-267). Reliability is an important criterion for research also because research cannot be valid unless it is reliable.

In this study, reliability has been aimed to take into consideration right from the beginning. First of all, the research process has been carefully planned and documented, and in terms of trackability, the research process has been documented and important research materials could be available for critical assessment. In the construction of data gathering, the threat of participant bias was tried to eliminate by choosing interviewees that are so independent that their answers would not be affected by anyone's ideas of what they should say, and additionally also by carefully trying to ensure the anonymity of the interviewees during the process. Also, for example the interview questionnaires were carefully structured to the extent that was found plausible for the purposes of this study in order to lessen potential observer error as a threat to reliability in the interviewing situation. (c.f. Saunders, Lewis & Thornhill 2007, 149-150.)

Naturally, the opportunities of the reproducibility of the conducted study are narrowed by the fact that the data gathering of the main empirical parts of the study was done already in the year 2000, which also has to be taken into account when evaluating and interpreting the research results. Still, also related to reliability, the results that are based on discourse at a certain point of time were not tried to manipulate to fit potentially better the changed conditions during the 21st century, but according to the nature of discourse based research methods, the results were reported based on careful analyses of the original interviewings and their results. The robustness of the results and conclusions of this study could be tested by follow-up studies, as will be reported at the end of this study in the section of suggestions for further research.

Validity

Validity is another important concept that has originally been developed for the purposes of assessing quantitative research. Still, when interpreted in a reasonable manner, it can also be applied to more qualitative research. Validitation in qualitative research can be defined as the extent to which qualitative findings accurately represent the phenomena being examined (Hair et al. 2007, 297). The lowered validity of a research can be a result of many causes, including mistakes in conceptualisation or interpretation, and also errors in data. Validity of a research can also be divided to two main parts, i.e. internal and external validity.

Internal validity can be defined to refer to the internal logic and consistency of the interpretation of the research results. In practice, this means that research results should follow logically from the research data and theories. Lincoln & Guba (1985) emphasise the use of multiple methods and their

comparison during a research process as an important source of internal validity.

External validity, in turn, refers typically to the extent to which the interpretation can also be generalised to other cases than the ones that were researched. Therefore, a researcher should be able to critically assess the generalisation of the results, and understand the limitations. A researcher that aims at generalisable results should hereby also be able to convince that her/his findings are not based on wrongly interpreted interviews, badly formulated and wrongly understood questions, or observations of atypical cases (Koskinen, Alasuutari & Peltonen 2005, 254-255) Generalisation of the results is a problematic area in qualitative research, since from a relatively small number of cases, it is typically difficult to make wider generalisations. Yin (2003) presents that also from a small number of cases it is possible to make generalisations by the help of a more general theory, and by a careful interpretation based on wider concepts. However, this is a problematic idea, and counterarguments can always also be made of whether certain findings really generally explain a phenomenon. In turn, Lincoln & Guba (1985) consider a rich description of the research topic that enables the transferability of research to another environment as an important source of external validity.

Overall, it can be said that in qualitative research, findings and related arguments can be backed up by theoretical information and earlier research findings, but still the generalisation of results by inductive thinking is problematic and leaves open questions (c.f. Koskinen, Alasuutari & Peltonen 2005, 169-172). Still, a lot can be learned about, and interesting insights and understanding about a phenomenon can be given, also from a small number of cases. Still, other studies on the same phenomenon in similar and different organisations would provide important further information and explanatory power to the findings (e.g. Strauss & Corbin 1998, 284-285).

In this study, the questions of internal and external validity have been seriously considered during the research process, also because of the relative novelty of the research topic and the chosen multidisciplinary approach. Since the major content of this study and its reporting is based on qualitative research approaches, the questions of validity of this study are in the following discussed especially from the viewpoint of the validity of qualitative research.

Validity of qualitative research has been argued to be improved by extended fieldwork, which refers to the collection of data over an extended period and can be said to improve both data discovery and interpretation (Head et al. 2007, 298). The data of this study was collected by altogether 50 interviews, which were conducted in two phases over a prolonged period, and where the results of the first round were also used in the development of interviewing patterns of the second round. Also, interaction involving participant feedback was a kind of in-built feature of the chosen data gathering method, which can also be argued to facilitate insights and interpretation, and thereby improve the validity of the study and its results. Further, there were certain phases in the research process that included careful external peer review

by other researchers and specialists, which has also been suggested as a potential source of improved validity. This kind of cooperation played an especially important role in the construction of the research setting and the operationalisation of the concept of qualification requirements for the measurement purposes of this study. (c.f. Head et al. 2007, 298.)

Both validity and reliability of especially qualitative research can be improved by the use of triangulation. In this study, different types of triangulation were aimed to use. In terms of data triangulation, data was collected from more than one group, i.e. both experts and representatives of enterprises, and the data from these groups could also be compared. What can also be considered for both validity and reliability is that data collection was based on expert based method, and the chosen interviewees were either carefully selected experts or representative of enterprises that were considered as the best practical experts of e-commerce in that particular enterprise and business. Also, data was collected from both groups at two different times, according to the principle of the Delphi method that was applied in this study. This can be also seen as a factor that enabled a kind of hermeneutical phenomenon, where data developed during the research process positively both in quantity and quality. Further, in terms of method triangulation, this study aimed to use both quantitative and qualitative methods to enrichen the picture of the chosen research topics. In addition, there can also be found elements of theory triangulation, in the sense that during the research process a lot of literature was used to have multiple perspectives on the research questions, and different ideas from the literature have also been utilised when interpreting and explaining the data and research findings. Also, related to researcher triangulation, the results of a number of other researches have been discussed in the reporting of this study also to enable the comparison of the results to the extent that it is found relevant. (c.f. Head et al. 2007, 298.)

In terms of generalisation, the results of this study are limited, and careful consideration is needed when thinking of generalisability. Although the sample was small, there are factors that support the idea that the chosen cases were a representative group of Finnish SMEs in many respects. Still, it has to be remembered that there are so many different kinds of SMEs in so diverse business sectors, that perhaps direct generalisation is not recommendable, but instead a better approach would be to discuss about the findings in SMEs case by case in order to get a picture which findings fit that particular environment, and also think about the most important development needs accordingly. So, it can be said that the findings of this study can potentially be generalised to Finnish SMEs, but not directly but with caution. Also, what has to be remembered is that the data was gathered in the year 2000, which has to be taken into account when assessing the generalisability of the results. Still, it can be argued that despite the potential problems in direct generalisation, the results of this study provide a lot of important general information to back up and support the development of many different kinds of SMEs in Finland in the development efforts of their e-commerce qualifications.

Relevance
The theoretical, scientific and practical relevance of this study were explained earlier from the viewpoint of theoretical, scientific and practical contributions. Overall, the relevance of the study can be considered high and many-sided, since it has served multiple purposes. It has also been based on the personal interests of the researcher, which has raised personal relevance and increased motivation for the research work. Despite certain weaknesses, there are strong arguments in favour of both academic and theoretical relevance. Still, perhaps most importantly, this study can be argued to have high practical relevance for different kinds of beneficiaries. This is also backed up by the fact that the study and its results have already raised interest, and they have been planned to be used for development purposes.

8.4 Suggestions for future research

This study has provided certain insights to a number of significant questions. Nevertheless, it has not been able to conclusively cover the challenging issues related to the chosen research topics. Also, this study has included important choices and limitations, which means that there are many issues that could have been done differently, and a lot of interesting room is left for further research. At the end of this study, here, ideas are represented on how future researches could go on from here to further investigate and analyse "the wonderful world of qualification requirements and e-commerce in SMEs".

First, since the empirical data of this study was collected already in the year 2000, it could be beneficial to conduct similar data collecting process again, analyse the results, and compare these new results with the ones analysed in this study in order to track differences and similarities. This could be a relevant way to complement the analyses of this thesis, which only represent a cross-section at a certain point of time. A further application of this idea would be to construct a longer time series. It would be interesting to renew the analyses every once in a while and see how the results develop, and analyse where there are similarities and potential differences.

One area of further research, which was considered important also in the results of this thesis, would be different kinds of industry and business sector specific analyses of qualification requirements. This would be a relevant idea, since also according to the findings of this study, the qualification (and other) requirements of e-commerce do vary between different industries, business sectors, markets etc. Though it certainly is valuable, information at a general level of SMEs is not enough to tackle these detailed specifics. Further, also deep-going and detailed analyses of individual enterprises could be beneficial to provide focused research approaches, and it could also provide consultative aid for the development activities of that particular enterprise.

Also it would be interesting to make analyses of qualification requirements based on different classifications of qualification areas. Hereby, it could be possible to further widen the scope of different kinds of qualifications, and on the other hand make very detailed analyses of certain specific qualification areas of subareas. Further, this study concentrated on the analyses at the level of enterprises, but it would also be interesting to make further analyses of the qualification requirements of individuals. Another potentially beneficial topic would be to combine qualification research with the idea of learning organisations, which emphasises the development of both individuals, teams and the whole organisation as interlinked levels that should match together also in terms of qualifications.

Especially from the academic perspective, a fascinating area of research could also be international comparisons. Finland is seen as one of the leading countries in the development of information society and also e-commerce solutions, but it would be highly interesting to compare Finnish enterprises and enterprises from other countries, potentially with higher populations and larger home market areas.

Also, comparative analyses of small enterprises and larger companies would be good to conduct. and thereby further clarify the differences between these groups. Also, in terms of scope of the context, this study has concentrated only on electronic commerce, but it could be highly relevant to have a look at the qualification (and other) requirements of e-business in a wider meaning. Alternatively, different parts of e-business could be picked under research separately to enable more focused analyses.

Overall, there certainly is a wide variety of opportunities for further research, which also illustrates the richness of the research area. This study has been able to provide certain information, but still it can also be seen as a good start for a longer exciting research journey. This journey is a challenging one, but worth taking. Hopefully there will be interest and resources available so that researchers could continue further on these topics both in terms of depth and width. This would certainly provide important contributions to further paving the way for successful development paths of Finnish SMEs in electronic commerce.

FINNISH SUMMARY (SUOMENKIELINEN YHTEENVETO)

Pk-yritysten kvalifikaatiovaatimukset Internet-pohjaisessa elektronisessa kaupankäynnissä – löydöksiä Suomesta

Elektroninen kaupankäynti (e-kauppa) ja sen kehitys on merkittävä liiketoiminnan muutostekijä, joka avaa myös pienille ja keskisuurille yrityksille (pk-yrityksille) uusia mahdollisuuksia, mutta asettaa niille samalla haasteita. E-kaupassa menestyminen edellyttää yrityksiltä monimuotoista osaamista (kvalifikaatioita), ja yritysten ohella e-kaupan kvalifikaatiovaatimuksiin ja osaamistarpeisiin liittyvälle tutkimukselle onkin kysyntää myös pk-yritysten osaamisen kehittymistä palvelevan koulutuksen ja julkisten tukitoimien kehittämiseksi. Tutkimuksen tuottamalle informaatiolle voidaan siten löytää monia käytännön hyödyntämismahdollisuuksia, minkä lisäksi tutkimuksella on akateemista merkitystä, sillä se pureutuu tärkeään ja ajankohtaiseen, mutta toistaiseksi edelleen suhteellisen vähän tutkittuun aiheeseen.

Tutkimuksen ensimmäinen päätutkimuskysymys on se, *millaisia kvalifikaatiovaatimuksia Internet-pohjainen elektroninen kaupankäynti asettaa pk-yrityksille*. Tämän kysymyksen alakysymyksinä tarkastellaan i) megatrendejä, jotka liittyvät elektroniseen kaupankäyntiin ja määrittävät osaltaan myös sen kvalifikaatiovaatimuksia, ii) pk-yritysten strategisia mahdollisuuksia ja kehityshaasteita elektronisessa kaupankäynnissä sekä iii) yritystason kvalifikaatiovaatimuksia täydentäviä näkemyksiä yksilöiltä edellytettävistä kvalifikaatioista.

Toinen päätutkimuskysymys keskittyy puolestaan siihen, *miten pk-yrityksiä voidaan tukea Internet-pohjaisen elektronisen kaupankäynnin vaatimien kvalifikaatioiden kehittämisessä ja hankkimisessa*. Tähän pääkysymykseen liittyvinä alakysymyksinä tarkastellaan myös sitä, i) miten koulutus voisi parhaiten tukea pk-yrityksiltä vaadittavien kvalifikaatioiden kehittämistä, ja ii) miten julkinen sektori voisi omilla toimenpiteillään tukea pk-yritysten elektronisen kaupankäynnin ja sen vaatimien kvalifikaatioiden kehittymistä.

Tutkimuksen teoreettinen viitekehys käsittelee toisaalta tutkittavaa ilmiötä eli kvalifikaatioita ja kvalifikaatiovaatimuksia, ja toisaalta elektronista kaupankäyntiä eli sitä kontekstia, jossa kvalifikaatiovaatimuksia tässä tutkimuksessa analysoidaan. Luku 2 keskittyy tarkastelemaan elektronista kaupankäyntiä ja määrittelee tämän tutkimuksen lähestymistapaa ja rajauksia kyseiseen käsitteeseen. Huomionarvoista tässä yhteydessä on, että tutkimuksessa keskitytään suomalaisten pk-yritysten Internet-pohjaiseen elektroniseen kaupankäyntiin. Luvussa tarkastellaan myös elektronisen kaupankäynnin kehitystä ja kehitysmahdollisuuksia erityisesti pk-yritysten näkökulmasta. Tilastollisten tarkastelujen avulla tuodaan lisäksi esille elektronisen kaupankäynnin yleistymistä ja merkityksen kasvua. Luvussa esitetään myös näkemyksiä elektronisen kaupankäynnin motiiveista ja esteistä pk-yrityksissä, pohditaan elektronisen kaupankäynnin mahdollisia kehityspolkuja erilaisissa pk-yrityksissä sekä esitetään ajatuksia elektronisen kaupankäynnin erilaisista mahdollisista rooleista pk-yritysten toiminnan kokonaisuudessa.

Luvussa 3 syvennytään puolestaan kvalifikaatioihin, kvalifikaatiovaatimuksiin ja niiden lähikäsitteisiin. Tarkastelussa tuodaan esille näiden käsitteiden moniulotteisuutta sekä keskustellaan kvalifikaatioiden kehittämisen sekä kvalifikaatiovaatimusten ennakoinnin haasteista erityisesti elektronisen kaupankäynnin kontekstissa. Keskustelua käydään sekä pk-yritysten että niiden kvalifikaatioiden kehittymistä palvelevan koulutuksen näkökulmista ja havainnollistetaan kvalifikaatiovaatimusten analysoinnin haasteellisuutta elektronisen kaupankäynnin kaltaisessa muuttuvassa ja nopeasti kehittyvässä kontekstissa.

Luku 4 keskittyy tutkimuksen metodologisten valintojen ja menetelmien kuvaamiseen. Luvussa tuodaan esille tutkimuksen metodologisia lähtökohtia ja pitkälti sosiaalisen konstruktivismin ajatuksiin pohjautuvia tutkimusstrategisia valintoja. Tutkimuksessa on hyödynnetty sekä kvalitatiivisia (laadullisia) että kvantitatiivisia (määrällisiä) tutkimusmenetelmiä, minkä voidaan katsoa osaltaan parantavan myös tulosten validiteettia ja reliabiliteettia. Pääpaino on kuitenkin erityisesti kvalitatiivisissa analyyseissa, mitä voidaan pitää tutkimuksen luonne ja tavoitteet huomioiden tarkoituksenmukaisena valintana.

Tutkimuksessa on sovellettu erityisesti tulevaisuudentutkimuksessa käytettyä Delfi-menetelmää. Empiirisen tutkimusinformaation keskeinen lähde ovat olleet kahden haastattelukierroksen aikana toteutetut haastattelut sekä niiden kautta kootun informaation systemaattinen analysointi ja prosessointi. Tutkimuksen haastattelut suoritettiin helmi-maaliskuussa 2000 (I haastattelukierros) ja loka-marraskuussa 2000 (II haastattelukierros). Sekä ensimmäisellä että toisella haastattelukierroksella suoritettiin yhteensä 25 haastattelua, eli haastattelujen kokonaismääräksi muodostui 50. Haastateltavat oli jaettu molemmilla kierroksilla kahteen pääryhmään seuraavasti: *elektronisen kaupankäynnin asiantuntijat* (15) ja *elektronista kaupankäyntiä harjoittavien yritysten edustajat* (10). Näistä ryhmistä ensimmäinen koostui eri tahoja edustavista henkilöistä, joita yhdisti korkean tason asiantuntemus ja kokemus elektronisesta kaupankäynnistä. Toiseen ryhmään pyrittiin puolestaan valitsemaan edustava ja mielenkiintoinen otos eri tavoilla ja strategioilla elektronista kaupankäyntiä harjoittavien yritysten edustajia. Osa yrityksistä oli keskittynyt pelkästään verkkokauppaan, kun taas osalla se täydensi perinteistä kaupankäyntiä ja muuta liiketoimintaa.

Yksi tutkimuksen haaste oli se, että kvalifikaatiovaatimukset ovat käsitteenä luonteeltaan osin abstrakti, ja käsitteen operationaalistaminen tutkittavissa ja mitattavissa olevaan muotoon vaati huolellista pohdintaa. Systemaattisten ja riittävän yksityiskohtaisten analyysien mahdollistamiseksi, kvalifikaatiovaatimusten analysoinnissa ja suoritetuissa haastatteluissa päädyttiin keskittymään kartoittamaan syvällisesti tiettyjä ennakkoon valittuja teemoja ja kvalifikaatiovaatimusten alueita. Tutkimuksessa sovelletun Delfi-menetelmän periaatteita seuraten, haastattelut rakennettiin lisäksi niin, että ensimmäisellä haastattelukierroksella keskeisiksi nousseita aiheita voitiin toisella kierroksella edelleen täsmentää ja syventää. Näin suoritettujen kaksivaiheisten haastattelujen lisäksi tutkimuksen aineistoina on hyödynnetty mm. aiempaa kirjallisuutta, aiempia tutkimuksia ja tilastoaineistoja. Näin on pyritty luomaan tutkimukselle vankka

teoreettinen viitekehys sekä myös vertailemaan saavutettuja tuloksia aiempiin näkemyksiin ja tutkimustuloksiin.

Luvussa 5 siirrytään analysoimaan tutkimuksen empiirisiä tuloksia. Luvussa esitetään suoritettujen haastattelujen perusteella keskeisimmiksi nousseet pk-yritysten e-kauppaan liittyvät megatrendit, minkä jälkeen tarkastellaan tuloksia erilaisiin e-kaupan kehitysteemoihin ja erityiskysymyksiin liittyen. Pk-yritysten asemaa tulevaisuuden e-kaupassa ja uudessa kilpailutilanteessa vaikeuttavat rajalliset raha-, aika- ja osaamisresurssit, mutta tulosten mukaan pk-yritysten mahdollisuuksiksi ja potentiaalisiksi menestystekijöiksi voivat muodostua selkeä fokusoituminen, korkeatasoinen substanssiosaaminen, verkostoyhteistyö ja nopea reagointi markkinamuutoksiin. Elektronisen kaupankäynnin muuttuvassa toimintaympäristössä yritysten tulisi seurata omaan toimintaansa vaikuttavia kehityslinjoja ja valita riittävän selkeästi oma elektronisen kaupankäynnin strategiansa yksilölliset lähtökohtansa ja tavoitteensa huomioiden.

Erilaisten pk-yritysten elektronisen kaupankäynnin kehitykseen ja samalla kvalifikaatiovaatimuksiin vaikuttavia tekijöitä ovat yrityksen koko, kehitysvaihe ja kokemus, e-kaupan rooli liiketoiminnan kokonaisuudessa, e-kaupan kohderyhmä sekä toimiala ja tuotteet. Mitä sisällöltään ja toiminnoiltaan kokonaisvaltaisemmiksi yrityksen e-kaupan ratkaisuja halutaan kehittää, sitä enemmän yleensä vaaditaan myös monipuolista ja kokonaisvaltaista osaamista.

Eri kvalifikaatioalueiden ja osaamisen jatkuvasta kehittämisestä huolehtiminen edellyttää pk-yrityksiltä ennakoivaa kehittämisnäkökulmaa. Haasteeksi muodostuu se, miten pk-yritykset pystyvät uudistamaan ja kehittämään strategiaansa, liiketoimintaprosessejaan, teknologisia ratkaisujaan ja kvalifikaatioitaan uudessa elektronisen kaupankäynnin ympäristössä. Usein kehitystoimenpiteiden menestyksekäs läpivienti edellyttäisikin muutoksia yrityksen organisaatioon ja yrityskulttuuriin. On myös muistettava, että yritystason osaaminen muodostuu yksilöiden osaamisen yhteisvaikutuksena, ja tutkimustulosten mukaan yrityksissä *tarvitaan sekä erikoistuneita spesiaaliosaajia että laaja-alaista ymmärrystä ja kokonaisuuksien hallintaa.* Toisaalta erityisesti pienimpien yritysten ei usein ole mahdollista palkata suurta määrää erikoistuneita osaajia, vaan kvalifikaatiot ja osaaminen on rakennettava pitkälti olemassa olevaa henkilöstöä kehittämällä ja ulkopuolisilta tahoilta hankittavien erityispalvelujen varaan. Pystyäkseen vastaamaan haasteisiin, pienten yritysten kannalta olisikin tärkeää rakentaa hyödyllisiä *yhteistyöverkostoja* ja tarkoituksenmukaisesti ulkoistaa oman ydinosaamisen ulkopuolisia toimintoja.

Luvussa 6 esitetään tutkimuksen ensimmäisen päätavoitteen kannalta keskeinen systemaattinen ja teemoittainen analyysi elektronisen kaupankäynnin osaamistarpeista. Luvussa analysoidaan elektronisen kaupankäynnin osaamistarpeita ensisijaisesti yritystasolla pitkälti liiketoiminnan eri osa-alueiden hallintaan pohjautuvan ennalta määritellyn kvalifikaatiovaatimusluokituksen puitteissa. Analysointi lähtee liikkeelle elektronisen kaupankäynnin kannalta keskeisiksi määriteltyjen neljän kvalifikaatioiden pääalueen merkitystä kartoittavasta kvantitatiivisesta analyysista. Analyysiin sisällytetyt neljä kvalifikaatioiden pääaluetta ovat *i) Markkinointi, myynti ja asiakaspalvelu, ii) Strateginen johtaminen ja liiketoimintaprosessien kehittäminen, iii) Tekniset kvalifikaatiot*

ja logistiikka, sekä iv) Innovaatiot ja tuotekehitys. Näiden pääalueiden merkitystä tarkastelevan kvantitatiivisen analyysin jälkeen edetään pääluokkien sisälle määriteltyjen keskeiseksi koettujen alaluokkien kvantitatiiviseen ja kvalitatiiviseen analysointiin. Kvantitatiivisen analyysin tavoitteena on tarkastella eri alaluokkien merkitystä, minkä jälkeen siirrytään analysoimaan kvalitatiivisesti kvalifikaatioiden eri alaluokkien sisältöä, merkitystä ja erilaisia haasteita erityisesti pk-yritysten näkökulmasta.

Suoritettujen kvalifikaatioanalyysien tulosten mukaan elektronisessa kaupankäynnissä korostuu vahvasti liiketoiminnallinen osaaminen. Tämä on merkittävä havainto, sillä usein esimerkiksi ”arkipuheessa” elektronisen kaupankäynnin kohdalla saatetaan korostaa erityisesti teknisiä ratkaisuja. Tutkimustulosten mukaan eräs keskeinen erityisesti pitkän aikavälin menestystä määrittävä tekijä on kyky strategiseen ajatteluun ja systemaattiseen suunnitteluun, jossa määritellään elektronisen kaupankäynnin tavoitteet ja rooli yrityksen kokonaisliiketoiminnassa. Tätä kautta voidaan edelleen edetä e-kaupan ratkaisujen tarkoituksenmukaiseen kehittämiseen. Tuloksista on myös pääteltävissä, että erilaiset liiketoiminnalliset ja tekniset kvalifikaatiot ja osaamisalueet näyttävät kietoutuvan entistä enemmän toisiinsa, ja menestyvä yritys onnistuu yhdistämään eri alueet asiakkaille ainutlaatuista lisäarvoa tuottavaksi kokonaisuudeksi.

Tutkimustulosten mukaan *asiakaslähtöisyydellä* on elektronisessa kaupankäynnissä hyvin suuri merkitys, ja asiakkaiden tarpeiden ymmärtäminen ja tyydyttäminen kilpailijoita paremmin on yritysten keskeinen menestystekijä. Erityisesti pitkällä aikavälillä näyttää keskeiseksi kvalifikaatiovaatimukseksi nousevan kyky kokonaisvaltaiseen *liiketoimintakonseptien kehittämiseen*. Keskeiseksi ominaisuudeksi, joka tulevaisuudessa erottaa menestyvät yritykset heikommin menestyvistä, näyttääkin muodostuvan pitkän aikavälin *strateginen suunnittelu*. Vaikka yritysten on varmistettava tiettyjen perustoimintojen ja prosessien jatkuva toiminta, niiden tulisikin kyetä panostamaan riittävästi myös *innovatiivisuuteen* ja jatkuvaan uudistumiseen. Lisäksi pk-yrityksissä on pohdittava yhä enemmän myös elektronisen kaupankäynnin kytkemistä ja integroimista yrityksen taustajärjestelmiin ja liiketoimintaprosessien kokonaisuuteen. Tärkeää olisi onnistua myös varmistamaan koko organisaation osallistuminen ja sitoutuminen valitun strategian toteuttamiseen, mitä voidaan osaltaan edistää esimerkiksi tiedonhallinta- ja viestintäjärjestelmillä. Eräänä onnistumisen perusedellytyksenä voidaan pitää myös uskoa oman liiketoimintakonseptin toimivuuteen ja positiivista yrittäjyyshenkeä. Erityisesti perinteisten, toimintaansa verkkokaupankäyntiin laajentavien yritysten kohdalla keskeistä on pystyä määrittelemään selkeästi *elektronisen kaupankäynnin rooli yrityksen liiketoiminnan kokonaisuudessa*. Yksittäisten kvalifikaatioalueiden hallinnan ohella olennaista onkin se, että *liiketoiminnan eri osa-alueet ja niiden vaatimat kvalifikaatiot saadaan toimimaan saumattomasti ja kokonaisuutta tukevasti yhteen*.

Kvalifikaatiovaatimusten analysoinnin jälkeen, luku 7 keskittyy tarkastelemaan elektronisessa kaupankäynnissä vaadittavien kvalifikaatioiden kehittämistä palvelevan koulutuksen ja osaamisen kehittämisen haasteita ja mahdollisuuksia. Keskeinen keino kvalifikaatiovaatimuksiin vastaamisessa on koulutus

eri muodoissaan, mutta koulutukselta edellytetään riittävää *uudistumiskykyä ja joustavuutta*. Huomattavaa on, että toimiva ja kehittyvä *peruskoulutusjärjestelmä* koettiin sekä asiantuntijoiden että yritysten edustajien keskuudessa hyvin keskeiseksi kvalifikaatioiden kehittämistä ja ammattitaitoisen työvoiman tarjontaa tukevaksi tekijäksi. Tämän tutkimuksen tulosten mukaan tutkintotavoitteisen koulutuksen ohella tärkeä merkitys on kuitenkin myös esimerkiksi yrityskohtaisella *täsmäkoulutuksella*, erilaisilla *työssä oppimisen* muodoilla sekä yleensäkin eri toimenpiteillä pk-yritysten henkilöstön *elinikäisen oppimisen* tukemiseksi. Sekä asiantuntijat että yritykset painottivatkin eri osaamisen hankintamuotojen välistä täydentävyyttä ja erilaiset tukimuodot henkilöstön koulutuksen mahdollistamiseksi nähtiin myös merkittäviksi keinoksi, joilla yhteiskunta voi tukea erityisesti pk-yritysten elektronisen kaupankäynnin kehitystä. Toisaalta tukien osalta koettiin tärkeäksi, etteivät ne vääristä kilpailutilannetta.

Pk-yritysten elektronisen kaupankäynnin kvalifikaatiovaatimuksiin vastaamiseksi, tärkeä merkitys on myös osaamis- ja työvoimatarpeiden *ennakoinnilla*. Tutkimuksen tulosten mukaan tarvetta koettiinkin olevan sekä laaja-alaisiin selvityksiin että spesifimpiin yritys- ja toimialakohtaisiin analysointeihin. Myös ennakointia tukevien riittävän yksinkertaisten ja käytännönläheisten menetelmien kehitystyötä toivottiin.

Luvussa 8 kootaan yhteen tutkimuksen keskeisiä tuloksia ja esitetään loppupäätelmiä. Tässäkin yhteydessä todetaan, että eräs tämän tutkimuksen keskeisistä tuloksista on se, että *tekniikka ja siihen liittyvä osaaminen ei suinkaan yksin riitä takaamaan onnistunutta elektronista kaupankäyntiä*. Sen sijaan korostetaan liiketoimintaprosessien kokonaisvaltaisen hallinnan merkitystä sekä tarvetta omaksua ja kehittää samanaikaisesti sekä liiketoiminnallisia että teknisiä kvalifikaatioita ja yhdistää näitä alueita toisiinsa. Haasteellista pk-yritysten kannalta on myös se, että samanaikaisesti koetaan tarvetta syvälliselle erityisosaamiselle sekä kokonaisvaltaiselle ajattelulle ja kokonaisuuksien hallinnalle. Näihin haasteisiin vastaamiseksi tarvitaan systemaattista strategista kehittämistyötä ja suunnitelmallista kvalifikaatioiden kehittämistä niin että eri yksilöiden kvalifikaatiot ja osaaminen saataisiin palvelemaan yritystä menestyksekkään kokonaisuuden kannalta optimaalisella tavalla.

Tulosten kokoamisen ja päätelmien jälkeen luvussa 8 tarkastellaan vielä suoritetun tutkimuksen kontribuutiota, jota voidaan pitää merkittävänä niin akateemisesti kuin käytännöllisesti sekä pk-yritysten että koulutuksen kehittämisen kannalta. Tämän jälkeen tarkastellaan vielä suoritettua tutkimusta kriittisesti ja arvioidaan tutkimuksen reliabiliteettia, validiteettia ja relevanssia. Tässä yhteydessä keskustellaan myös mm. tutkimustulosten yleistettävyydestä, joka on pienen tutkimusotoksen ja valittujen tutkimusmenetelmien seurauksena rajallinen. Lopuksi esitetään joukko mahdollisia jatkotutkimusaiheita, joista esimerkkeinä voidaan mainita uusintatutkimus, jonka tuloksia voitaisiin myös verrata tässä raportoituihin tuloksiin. Lisäksi hyödyllisiä voisivat olla tarkemmat toimiala-, sektori- ja yrityskohtaiset tutkimukset, samoin kuin tutkimukset, joissa tarkasteltaisiin vertailevasti pk-yrityksiä ja suurempia yrityksiä. Lisäksi omaa tärkeää lisäarvoa voisivat tuottaa tutkimukset, joissa lähestyttäisiin kvali-

fikaatioita ja kvalifikaatiovaatimuksia erilaisia näkökulmia ja luokituksia hyödyntäen kuin tässä tutkimuksessa. Lisäksi on huomioitava, että tässä tutkimuksessa keskityttiin suomalaisiin pk-yrityksiin, ja olisikin mielenkiintoista tehdä vastaavantyyppistä tutkimusta kansainvälisesti.

Kokonaisuutena voidaan todeta, että tämän tutkimuksen tekeminen on ollut mielenkiintoista. Tutkimus on avannut uusia näkökulmia suomalaiseen elektronisen kaupankäynnin ja kvalifikaatiovaatimusten tutkimukseen ja tuottanut uutta useiden tahojen kannalta relevanttia informaatiota. Kuitenkin elektroninen kaupankäynti on jatkuvasti kehittyvä liiketoiminnan kehitysteema, ja siitä ja sen kvalifikaatiovaatimusten kehityksestä tarvitaan myös jatkossa uutta tutkimusta, joka täydentää ja syventää tässä tutkimuksessa tehtyä työtä.

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APPENDIX 1: Interview questionnaire of the first round of expert interviews (Translated from the original interview questionnaire in Finnish language)

QUALIFICATION REQUIREMENTS OF SMES IN INTERNET-BASED ELECTRONIC COMMERCE

Interview questionnaire / First round of expert interviews (winter/spring 2000)

I BACKGROUND INFORMATION

Name _____ Tel: _____

Organisation _____ Fax: _____

Title/Position_____ Email: _____

Work tasks related to electronic commerce _____

II FUTURE OF ELECTRONIC COMMERCE

1. What do you consider as the three most important megatrends (general major development lines) in the field of electronic commerce?

1. _____
2. _____
3. _____

2. What do you consider as the three most significant changes or development lines that affect the future qualification requirements of electronic commerce?

a) in the short run (1 month – 1 year)?

1. _____
2. _____
3. _____

b) in the long run (1 – 5 years)?

1. _____
2. _____
3. _____

3. In your opinion, what are the industries/business sectors, where the impact of electronic commerce is highest?

a) in the short run (1 month – 1 year)?

_____
_____

b) in the long run (1 – 5 years)?

_____
_____

4. The purpose of the following analysis is to observe the development of electronic commerce by the use of a SWOT analysis.

Please assess:

a) the most significant strengths and weaknesses in electronic commerce at the moment (S – W),
b) the most significant opportunities and threats (O – T) related to the future development of electronic commerce.

STRENGTHS **WEAKNESSES**

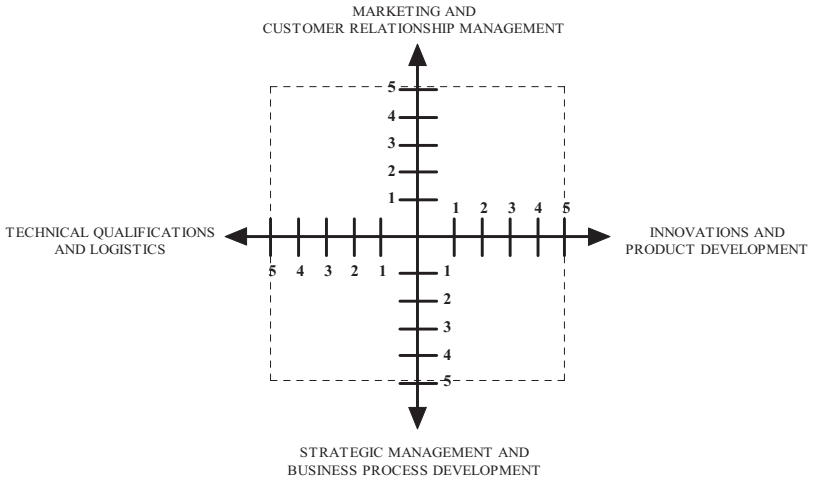
OPPORTUNITIES **THREATS**

III QUALIFICATION REQUIREMENTS OF ELECTRONIC COMMERCE IN SMES

1. With the help of the following diagram, assess the significance of the following qualification areas in the electronic commerce of SMEs

a) in the short run (1 month – 1 year)
b) in the long run

(5 = high significance, 4 = quite high significance, 3 = middle-level significance, 2 = quite low significance, 1 = low significance)



Comments and explanations:

_____

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_____

_____

_____

2. With the help of the following classification of different subareas of the earlier observed qualification areas, assess the significance of each subarea from the viewpoint of SMEs in electronic commerce

a) in the short run (1 month –1 year) (S)
b) in the long run (L)

At the same time, you can assess how the significance of each subarea of qualifications develops/changes between the short run and the long run.

The scale is the following:
(5 = high significance, 4 = quite high significance, 3 = middle-level significance, 2 = quite low significance, 1 = low significance)

Further, if you can specify the more detailed requirements under each of the presented subareas of qualifications - please present what kinds of detailed qualifications would you consider to be required under each of them.

A) Marketing and customer relationship management

			S						L		
1. Creation and development of customer relationships	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

			S						L		
2. Marketing and advertising activities	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

			S						L		
3. Management of the marketing chain (and its different processes)	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

			S						L		
4. Systematic marketing planning	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

			S						L		
5. Use of indirect marketing channels	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

			S						L		
6. Marketing legislation and legal issues	5	4	3	2	1		5	4	3	2	1

_____

_____

B) Strategic management and business process development

			S						L		
1. Strategic business management	5	4	3	2	1		5	4	3	2	1

_____

_____

			S						L		
2. Information management and process integration	5	4	3	2	1		5	4	3	2	1

_____

_____

			S						L		
3. Monitoring, evaluation and development of business	5	4	3	2	1		5	4	3	2	1

_____

_____

			S						L		
4. Human resource management	5	4	3	2	1		5	4	3	2	1

_____

_____

			S						L		
5. Strategic cooperation, partnerships etc.	5	4	3	2	1		5	4	3	2	1

_____

_____

			S						L		
6. Industry-specific knowledge	5	4	3	2	1		5	4	3	2	1

_____

_____

C) Technical qualifications and logistics

	S					L				
1. Information and net security	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
2. Payment systems and monetary transactions	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
3. Logistics and delivery of goods	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
4. Development of e-commerce sites	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
5. Technical system integration	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
6. Mobile and wireless technologies	5	4	3	2	1	5	4	3	2	1

_____

_____

D) Innovations and product development

	S					L				
1. Marketing and product innovations	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
2. Technical and business innovations	5	4	3	2	1	5	4	3	2	1

_____

_____

	S					L				
3. Implementation and process innovations	5	4	3	2	1		5	4	3	2	1

_____
_____

	S					L				
4. Organisational innovations	5	4	3	2	1		5	4	3	2	1

_____
_____

3. In addition to the qualification areas and their subareas presented above, what other qualifications or special skills would you consider significant from the viewpoint of future electronic commerce of SMEs? Why?

_____
_____
_____
_____
_____
_____
_____

VI CHANGES IN THE LABOUR MARKETS

1. Assess what are the professional groups/professions that will grow fastest (in terms of number of employees) in the future electronic commerce?

1. _____
2. _____
3. _____

2. Assess what are the professional groups/professions that will have the biggest lack of qualified labour force in future electronic commerce?

1. _____
2. _____
3. _____

3. What would you consider as the three most important general criteria that employers use when recruiting new personnel for electronic commerce?

1. _____
2. _____
3. _____

4. What would you consider as the three most important special areas of qualifications in electronic commerce that will be most needed/respected by employers?

1. _____
2. _____
3. _____

5. How do you assess the impacts of electronic commerce on the future labour markets in the commercial field (e.g. changes in the content of work, changes in the quantities of demand for different professionals or workers, changes in work tasks, changes in positions of the personnel, changes in wages etc.)?

_____
_____
_____
_____
_____
_____
_____

6. How do you see the potential impact of electronic commerce on the long term regional development of commerce?

_____
_____
_____
_____
_____
_____
_____

V EDUCATION/TRAINING AND QUALIFICATION REQUIREMENTS OF E-COMMERCE

1. Assess the ability of the following levels of education or forms of training to respond to the qualification requirements of electronic commerce

(5 = very good, 4 = good, 3 = average, 2 = bad, 1 = very bad)

1. Universities	5	4	3	2	1
2. Polytechnics	5	4	3	2	1
3. Basic vocational education	5	4	3	2	1
4. On-the-job learning systems	5	4	3	2	1
5. Apprenticeship contract	5	4	3	2	1
6. Tailored training programmes in an enterprise	5	4	3	2	1
7. Learning courses outside an enterprise	5	4	3	2	1
8. Virtual or net-based learning	5	4	3	2	1
9. Mutual training for enterprises in one business sector	5	4	3	2	1
10. Mutual training for enterprises in different business sectors	5	4	3	2	1
11. Self-learning of individuals	5	4	3	2	1

Some other very significant, what and how? _____
_____

2. Assess the ability of the following ways of acquiring new qualifications to respond to the individual needs of SMEs in electronic commerce

(5 = very good, 4 = good, 3 = average, 2 = bad, 1 = very bad)

1. Recruitment of new qualified personnel	5	4	3	2	1
2. Training of existing personnel	5	4	3	2	1
3. Buying of specialised services	5	4	3	2	1
4. Individual learning of employees	5	4	3	2	1
5. Cooperation projects with different institutions	5	4	3	2	1
6. Use of students as sources of new knowledge	5	4	3	2	1
7. Support from enterprise unions	5	4	3	2	1
8. Cooperation with customers	5	4	3	2	1
9. Cooperation with other enterprises	5	4	3	2	1
10. Cooperation with international cooperative partners	5	4	3	2	1
11. Cooperation with experts	5	4	3	2	1
12. Use of consultants	5	4	3	2	1

Some other very significant, what and how?_____
_____

3. What do you consider as the biggest defects/problems/deficiencies in the educational and training activities to respond to the qualification requirements of electronic commerce?

_____
_____

4. What are the most important issues or development areas that would be required from the educational institutions that provide education in the field of electronic commerce?

_____
_____

5. Suggestions to educational institutions, authorities and decision makers for the development of education and qualifications in the field of electronic commerce

_____
_____
_____

VI ANTICIPATION OF QUALIFICATION REQUIREMENTS OF E-COMMERCE

1. Would you consider continuous analyses of the future qualification requirements of electronic commerce to be needed?

yes no

2. How should the analyses of the qualification requirements of electronic commerce be conducted in the future?

_____
_____
_____

3. Do you believe that there would be a need/a possibility to build a network-based anticipation system between the enterprises and other actors in electronic commerce? How should this kind of system be implemented?

_____
_____
_____

4. What would you consider as the best ways to develop the self-anticipation readiness and skills of future qualification requirements by the SMEs in electronic commerce?

_____
_____
_____

VII OTHER COMMENTS, OBSERVATIONS OR DEVELOPMENT IDEAS

_____
_____
_____
_____
_____
_____

THANK YOU FOR YOUR ANSWERS! HAVE A NICE SPRING!

APPENDIX 2: Interview questionnaire of the first round of the interviews of the representatives of enterprises (Translated from the original interview questionnaire in Finnish language)

QUALIFICATION REQUIREMENTS OF SMES IN INTERNET-BASED ELECTRONIC COMMERCE

Interview questionnaire / First round of enterprise interviews (winter/spring 2000)

I BACKGROUND INFORMATION

Name _____ Tel: _____

Organisation _____ Fax: _____

Title/Position_____ Email: _____

Amount of personnel _____ Turnover _____

Work tasks related to electronic commerce _____

II FUTURE OF ELECTRONIC COMMERCE

1. From the viewpoint of your enterprise, what do you consider as the three most important megatrends (general major development lines) in electronic commerce?

1. _____
2. _____
3. _____

2. How do you assess the significance of electronic commerce in your industry/business sector

a) in the short run (1 month – 1 year)?

_____
_____

b) in the long run?

_____
_____

3. What do you consider as the most significant factors that help to gain competitive advantage in electronic commerce in your industry/business field

a) in the short run (1 month – 1 year)?

_____
_____

b) in the long run?

_____
_____

4. The classification in the following figure presents one approach to assess the position of an enterprise in terms of the development stage of electronic commerce. At what level would you assess your enterprise to be in the presented classification

a) at the moment?

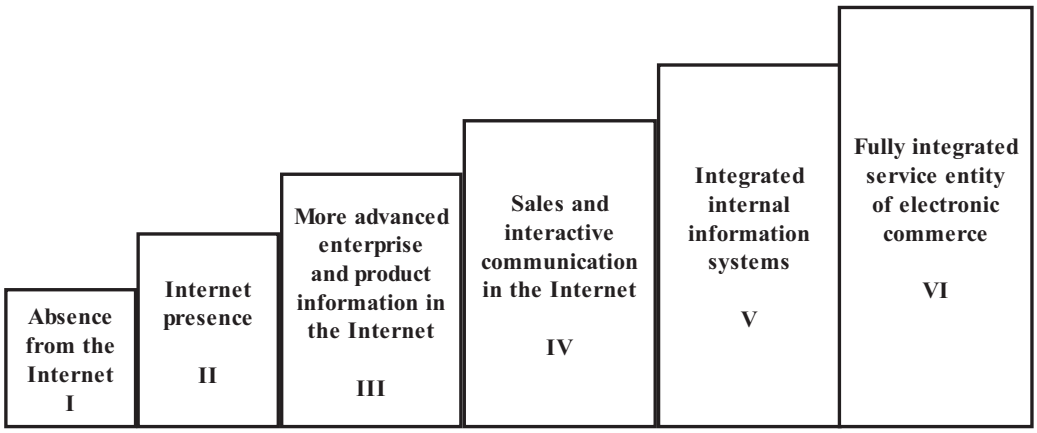
_____
_____
_____

b) after 1 year?

_____
_____
_____

c) after 5 years?

_____
_____
_____



(c.f. Kettunen S. & Filenius M. 1998. *Elektroninen kaupankäynti*, Teknolit Oy, Gummerus)

5. The purpose of the following analysis is to observe the development of electronic commerce in your enterprise by the use of a SWOT analysis. By the help of the analysis, please assess from the viewpoint of your enterprise, what are:

a) the most significant strengths and weaknesses in electronic commerce at the moment (S – W),
b) the most significant opportunities and threats (O – T) related to the future development of electronic commerce.

STRENGTHS **WEAKNESSES**

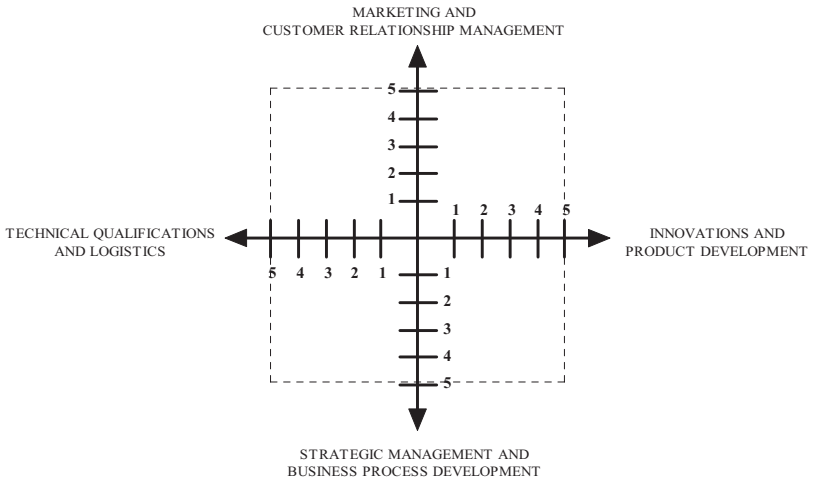
OPPORTUNITIES **THREATS**

III QUALIFICATION REQUIREMENTS OF ELECTRONIC COMMERCE

1. **With the help of the following diagram, from the viewpoint of your enterprise, assess the significance of the following qualification areas of electronic commerce of SMEs**

a) **in the short run (1 month – 1 year)**
b) **in the long run**

(5 = high significance, 4 = quite high significance, 3 = middle-level significance, 2 = quite low significance, 1 = low significance)



Comments and explanations:

_____
_____
_____
_____
_____

2. With the help of the following classification of different subareas of the earlier observed qualification areas, assess the significance of each subarea from the viewpoint of electronic commerce of your enterprise

a) in the short run (1 month –1 year) (S)
b) in the long run (L)

At the same time, you can assess how the significance of each subarea of qualifications develops/changes between the short run and the long run.

The scale is the following:
(5 = high significance, 4 = quite high significance, 3 = middle-level significance, 2 = quite low significance, 1 = low significance)

Also assess, to what extent each of the subareas will be taken of by your own personnel, and to what extent do you acquire the qualifications and fulfilment of the tasks required in each subarea from outside your own enterprise (e.g. by outsourcing, hired labour etc.).

A) Marketing and customer relationship management

	S					L				
1. Creation and development of customer relationships	**5**	**4**	**3**	**2**	**1**	**5**	**4**	**3**	**2**	**1**

_____
_____

	S					L				
2. Marketing and advertising activities	**5**	**4**	**3**	**2**	**1**	**5**	**4**	**3**	**2**	**1**

_____
_____

	S					L				
3. Management of the marketing chain (and its different processes)	**5**	**4**	**3**	**2**	**1**	**5**	**4**	**3**	**2**	**1**

_____
_____

	S					L				
4. Systematic marketing planning	**5**	**4**	**3**	**2**	**1**	**5**	**4**	**3**	**2**	**1**

_____
_____

	S					L				
5. Use of indirect marketing channels	**5**	**4**	**3**	**2**	**1**	**5**	**4**	**3**	**2**	**1**

_____
_____

	S					L				
6. Marketing legislation and legal issues	5	4	3	2	1		5	4	3	2	1

B) Strategic management and business process development

	S					L				
1. Strategic business management	5	4	3	2	1		5	4	3	2	1

	S					L				
2. Information management and process integration	5	4	3	2	1		5	4	3	2	1

	S					L				
3. Monitoring, evaluation and development of business	5	4	3	2	1		5	4	3	2	1

	S					L				
4. Human resource management	5	4	3	2	1		5	4	3	2	1

	S					L				
5. Strategic cooperation, partnerships etc.	5	4	3	2	1		5	4	3	2	1

	S					L				
6. Industry-specific knowledge	5	4	3	2	1		5	4	3	2	1

C) Technical qualifications and logistics

	S					L				
1. Information and net security	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
2. Payment systems and monetary transactions	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
3. Logistics and delivery of goods	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
4. Development of e-commerce sites	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
5. Technical system integration	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
6. Mobile and wireless technologies	5	4	3	2	1		5	4	3	2	1

_____

_____

D) Innovations and product development

	S					L				
1. Marketing and product innovations	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
2. Technical and business innovations	5	4	3	2	1		5	4	3	2	1

_____

_____

	S					L				
3. Implementation and process innovations	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

	S					L				
4. Organisational innovations	**5**	**4**	**3**	**2**	**1**		**5**	**4**	**3**	**2**	**1**

_____
_____

3. In addition to the qualification areas and their subareas presented above, what other qualifications or special skills would you consider significant from the viewpoint of future electronic commerce of SMEs? Why?

_____
_____
_____
_____
_____

4. Which of the above qualification subareas, would you consider as the three most significant from the viewpoint of electronic commerce of your enterprise?

1. _____
2. _____
3. _____

IV EDUCATION/TRAINING AND QUALIFICATION REQUIREMENTS OF ELECTRONIC COMMERCE

1. Assess the ability of the following levels of education or forms of training to respond to your enterprise's qualification requirements of electronic commerce

(5 = very good, 4 = good, 3 = average, 2 = bad, 1 = very bad)

1. Universities	5	4	3	2	1
2. Polytechnics	5	4	3	2	1
3. Basic vocational education	5	4	3	2	1
4. On-the-job learning systems	5	4	3	2	1
5. Apprenticeship contract	5	4	3	2	1
6. Tailored training programmes in an enterprise	5	4	3	2	1
7. Learning courses outside an enterprise	5	4	3	2	1
8. Virtual or net-based learning	5	4	3	2	1
9. Mutual training for enterprises in one business sector	5	4	3	2	1
10. Mutual training for enterprises in different business sectors	5	4	3	2	1
11. Self-learning of individuals	5	4	3	2	1

Some other very significant, what and how?_____
_____

2. Assess the ability of the following ways of acquiring new qualifications to respond to the individual needs of your enterprise in electronic commerce

(5 = very good, 4 = good, 3 = average, 2 = bad, 1 = very bad)

1. Recruitment of new qualified personnel	5	4	3	2	1
2. Training of existing personnel	5	4	3	2	1
3. Buying of specialised services	5	4	3	2	1
4. Individual learning of employees	5	4	3	2	1
5. Cooperation projects with different institutions	5	4	3	2	1
6. Use of students as sources of new knowledge	5	4	3	2	1
7. Support from enterprise unions	5	4	3	2	1
8. Cooperation with customers	5	4	3	2	1
9. Cooperation with other enterprises	5	4	3	2	1
10. Cooperation with international cooperative partners	5	4	3	2	1
11. Cooperation with experts	5	4	3	2	1
12. Use of consultants	5	4	3	2	1

Some other very significant, what and how?_____
_____

3. What do you consider as the biggest defects/problems/deficiencies in the acquiring of the required qualifications for the purposes of electronic commerce in your enterprise? (e.g. lack of persons available with required qualifications, high costs of acquiring special knowledge/skills, not enough outsourcing services available etc.)

_____
_____
_____

4. Suggestions to educational institutions, authorities and decision makers for the development of education and qualifications in the field of electronic commerce

_____
_____
_____

VI ANTICIPATION OF QUALIFICATION REQUIREMENTS OF E-COMMERCE

1. Would you consider continuous analyses of the future qualification requirements of electronic commerce to be needed?

yes no

2. How should the analyses of the qualification requirements of electronic commerce be conducted in the future?

_____
_____

3. Do you believe that there would be a need/a possibility to build a network-based anticipation system between the enterprises and other actors in electronic commerce? How should this kind of system be implemented?

_____
_____

4. What would you consider as the best ways to develop the self-anticipation readiness and skills of future qualification requirements by the SMEs in electronic commerce?

_____
_____

VII OTHER COMMENTS, OBSERVATIONS OR DEVELOPMENT IDEAS

_____
_____
_____
_____

THANK YOU FOR YOUR ANSWERS! HAVE A NICE SPRING!

APPENDIX 3: Interview questionnaire of the second round of expert interviews (Translated from the original interview questionnaire in Finnish language)

QUALIFICATION REQUIREMENTS OF SMES IN INTERNET-BASED ELECTRONIC COMMERCE

Interview questionnaire / Second round of expert interviews (autumn 2000)

I BACKGROUND INFORMATION

Name _____ Tel: _____

Organisation _____ Fax: _____

Title/Position_____ Email: _____

Work tasks related to electronic commerce _____

_____

II SIGNIFICANT DEVELOPMENT TOPICS IN E-COMMERCE

1. Critically assess, what are in your opinion the three most significant development topics of electronic commerce

a) At the moment (year 2000)

1. _____
2. _____
3. _____

b) After 1 year (year 2001)

1. _____
2. _____
3. _____

c) After 3 years (year 2003)

1. _____
2. _____
3. _____

d) After 10 years (year 2010)

1. _____
2. _____
3. _____

III SMALL ENTERPRISES VS. LARGE COMPANIES IN ELECTRONIC COMMERCE

1. What do you consider as the most significant differences in the e-commerce related activities of small enterprises and large companies now and in the near future (e.g. strategy, practical implementation of solutions etc.)?

_____
_____
_____
_____
_____
_____

2. How do you see the success potential of SMEs in

a) business-to-business electronic commerce, and

b) business-to-consumer electronic commerce?

Are there differences between the success potential of these, and if there are, why?

_____
_____
_____
_____
_____
_____

3. What do you consider as the critical success factors of SMEs and large companies in electronic commerce and its competition? (Critical success factors can concern either B-to-B electronic commerce or B-to-C electronic commerce. Please mention, which of these you refer to in the case of each factor).

SMES

1. _____
2. _____
3. _____

LARGE COMPANIES

1. _____
2. _____
3. _____

4. What do you see as the most significant practical measures by which SMEs and large companies could improve their position in the future electronic commerce markets? (The measures can concern either B-to-B electronic commerce or B-to-C electronic commerce. Please mention, which of these you refer to in the case of each measure).

SMES

1. _____
2. _____
3. _____

LARGE COMPANIES

1. _____
2. _____
3. _____

5. How do you see the development of the future electronic markets? Are the markets going to increasingly concentrate in the hands of a small number of strong companies/alliances, or will competitive SMEs be able to pull the developments to the other direction? (Concentration of markets vs. increasing diversity in markets).

_____
_____
_____
_____

6. What do you consider to be the biggest differences between the qualification requirements of SMEs and large companies in electronic commerce? What qualification requirements will be especially emphasised in SMEs?

_____
_____
_____
_____
_____
_____
_____

IV EXPERIENCE IN BUSINESS AND ELECTRONIC COMMERCE (EXPERIENCED ENTERPRISES VS. START-UPS)

1. What do you consider as the most significant differences in the critical success factors between the electronic commerce start-ups and the enterprises that have operated longer in electronic commerce? How about the differences in qualification requirements? Are there any questions/problems that are especially emphasised in the case of start-ups?

_____
_____
_____
_____
_____
_____
_____

2. What is your vision, will electronic commerce be more dominated by the enterprises/companies that operate both in electronic markets and more traditional markets, or new enterprises/companies that concentrate only on electronic commerce? Why?

_____
_____
_____
_____
_____

3. How important do you consider the integration of electronic commerce and other business & its systems to be from the viewpoint of an enterprise's future success potential? In this respect, are there potential differences between start-ups and enterprises that have operated already longer? Why?

_____
_____
_____
_____
_____
_____

4. How do you see the importance of the product from the viewpoint of starting electronic commerce? What kinds of products/product groups do you see especially easy/difficult from the viewpoint of starting electronic commerce? For example, are there differences between digital products and "more traditional" products in this respect?

_____
_____
_____
_____
_____
_____

V OUTSOURCING AND NETWORKING

1. In the light of the results of the first round of interviews, it can be argued that it would be beneficial for SMEs to outsource many e-commerce activities and development measures. From your viewpoint, what are the most significant development needs of the outsourcing services that are provided and sold to SMEs?

_____
_____
_____
_____

2. How could the interaction between SMEs and the providers of outsourced services be improved or developed?

_____
_____
_____
_____

3. In the first round of interviews, networking and new ways of cooperation were seen as a potentially important competitive weapon of SMEs in electronic commerce. What advice or ideas would you give to SMEs to promote value-adding networking and finding and choosing of appropriate cooperation partners?

_____
_____
_____
_____
_____

VI DEVELOPMENT OF QUALIFICATIONS AND EDUCATIONAL/TRAINING SYSTEM

1. **From your viewpoint, to promote the positive development of electronic commerce in SMEs important measures/changes that would be needed in the following levels of education? (e.g. learning objectives, content of studies, practical implementation and arrangements of education, that particular level of education in general etc.)**

A) Basic education (comprehensive school and high school)

_____
_____
_____
_____
_____

B) Basic vocational education

_____
_____
_____
_____

C) Polytechnics

_____
_____
_____
_____

D) Universities and other education at the master level or higher level

_____
_____
_____
_____

2. What do you consider as the best measures to develop and support the learning and development of the qualifications of electronic commerce within SMEs? How could the society promote this?

_____
_____
_____
_____
_____

3. Overall, how do you see the role of the support, guidance and educational/training services provided by the society for the future development of electronic commerce in SMEs? What would be the best ways to support SMEs in the future?

_____
_____
_____
_____
_____

VII. FURTHER COMMENTS, OBSERVATIONS OR IDEAS FOR FUTURE DEVELOPMENT

_____
_____
_____
_____
_____

THANK YOU FOR YOUR ANSWERS! HAVE A NICE AUTUMN!

APPENDIX 4: Interview questionnaire of the second round of the interviews of the representatives of enterprises (Translated from the original interview questionnaire in Finnish language)

QUALIFICATION REQUIREMENTS OF SMES IN INTERNET-BASED ELECTRONIC COMMERCE

Interview questionnaire / Second round of the interviews of the representatives of enterprises (autumn 2000)

I BACKGROUND INFORMATION

Name _____ Tel: _____

Organisation _____ Fax: _____

Title/Position_____ Email: _____

Work tasks related to electronic commerce _____

_____

II POSITION OF YOUR ENTERPRISE IN ELECTRONIC COMMERCE

1. When and how did you decide to enter electronic commerce? What were the most important reasons for starting electronic commerce?

_____

_____

_____

_____

2. Based on your experiences, what were the most significant problem factors/deficiencies in qualifications/"bottlenecks" at the starting phase of electronic commerce?

_____

_____

_____

3. What are the most significant problems in your electronic commerce at the moment?

1. _____
2. _____
3. _____

4. What could be the most suitable future solutions to these problems?

_____

_____

_____

5. How do you consider your electronic commerce to have developed during the recent past? What kinds of future plans do you have? How would you assess your competitive situation to be in the future e-commerce markets, and how could you develop your competitive position?

_____
_____
_____
_____
_____
_____
_____

III QUALIFICATION REQUIREMENTS OF YOUR ENTEPRISE AND ITS PERSONNEL

1. From the viewpoint of your own organisation, assess whether the following qualification areas of electronic commerce will be such that their tasks will be organised internally or outsourced in the near future.

A) If you consider that the tasks of a qualification area will be mostly organised internally, please assess:

a) What kinds of concrete tasks will there be in that particular area of electronic commerce and what will be the work tasks like?

b) What kinds of specified and concrete qualification requirements are there for that particular area to successfully do the tasks in the future?

Do you think that the lack of qualifications makes the implementation of that particular area problematic in your enterprise?

What kinds of development of qualifications would your enterprise need in that particular area?

c) What kinds of tools/equipment (machinery/hardware, programmes, systems etc.) would your enterprise need for the successful implementation of that particular area in the future?

B) If you consider that the tasks of a qualification area are/will be mostly outsourced, please answer the following questions:

a) Why have you outsourced that particular area of qualifications/tasks?
b) How have you organised the tasks/what kinds of outsourced services do you use?
c) How do you see the providers of outsourced services to have succeeded? What potential problems or future development needs have appeared?

A) MARKETING AND CUSTOMER RELATIONSHIP MANAGEMENT

1. Creation and development of customer relationships

A) _____
_____
_____

B) _____
_____
_____

2. Marketing and advertising activities

A) _____
_____
_____

B) _____
_____
_____

3. Management of the marketing chain (and its different processes)

A) _____
_____
_____

B) _____
_____
_____

4. Systematic marketing planning

A) _____
_____
_____

B) _____
_____
_____

5. Use of indirect marketing channels

A) _____
_____
_____

B) _____
_____
_____

6. Marketing legislation and legal issues

A) _____
_____
_____

B) _____
_____
_____

B) STRATEGIC MANAGEMENT AND BUSINESS PROCESS DEVELOPMENT

1. Strategic business management

A) _____
_____
_____

B) _____
_____
_____

2. Information management and process integration

A) _____
_____
_____

B) _____
_____
_____

3. Monitoring, evaluation and development of business

A) _____
_____
_____

B) _____
_____
_____

4. Human resource management

A) _____

B) _____

5. Strategic cooperation, partnerships etc.

A) _____

B) _____

6. Industry-specific knowledge

A) _____

B) _____

C) TECHNICAL QUALIFICATIONS AND LOGISTICS

1. Information and net security

A) _____

B) _____

2. Payment systems and monetary transactions

A) _____

B) _____
_____
_____

3. Logistics and delivery of goods

A) _____
_____
_____

B) _____
_____
_____

4. Development of e-commerce sites

A) _____
_____
_____

B) _____
_____
_____

5. Technical system integration

A) _____
_____
_____

B) _____
_____
_____

6. Mobile and wireless technologies

A) _____
_____
_____

B) _____
_____
_____

D) INNOVATIONS AND PRODUCT DEVELOPMENT

1. Marketing and product innovations

A) _____
_____
_____

B) _____
_____
_____

2. Technical and business innovations

A) _____
_____
_____

B) _____
_____
_____

3. Implementation and process innovations

A) _____
_____
_____

B) _____
_____
_____

4. Organisational innovations

A) _____
_____
_____

B) _____
_____
_____

IV DEVELOPMENT OF PUBLIC SECTOR SUPPORT

1. What do you consider as most significant ways/measures by which the public sector could support

a) general development of the e-commerce (and e-business) activities of your enterprise

_____
_____
_____

b) development of the required qualifications for the electronic commerce of your enterprise

_____
_____
_____

2. How do you see the general meaning of the public sector support (grants, advisory services, education and training) for the development of the electronic commerce of your enterprise?

_____
_____
_____

V COMMENTS AND SUGGESTIONS FOR FUTURE DEVELOPMENT

_____
_____
_____
_____
_____

THANK YOU FOR YOUR ANSWERS! HAVE A NICE AUTUMN!

APPENDIX 5: Statistical information of the distribution of the answers on the significance of the chosen main areas of qualifications

EXPERTS:

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
SHORT TERM					
Marketing and customer relationship management	4,2	1,0	5	2	5
Technical qualifications and logistics	3,8	1,1	5	2	5
Strategic management and business process development	4,0	1,1	5	2	5
Innovations and product development	4,1	1,0	5	2	5
LONG TERM					
Marketing and customer relationship management	4,2	0,8	4	3	5
Technical qualifications and logistics	3,9	1,1	4	2	5
Strategic management and business process development	4,5	0,6	5	3	5
Innovations and product development	4,3	0,9	5	2	5

REPRESENTATIVES OF ENTERPRISES:

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
SHORT TERM					
Marketing and customer relationship management	4,1	1,0	5	3	5
Technical qualifications and logistics	4,0	1,3	5	2	5
Strategic management and business process development	3,4	1,3	5	2	5
Innovations and product development	3,2	1,5	4	1	5
LONG TERM					
Marketing and customer relationship management	4,8	0,6	5	3	5
Technical qualifications and logistics	3,9	1,0	3	3	5
Strategic management and business process development	3,8	1,4	5	2	5
Innovations and product development	4,1	1,3	5	1	5

APPENDIX 6: Statistical information of the distribution of the answers on the significance of the chosen subareas of qualifications

EXPERTS:

Short term

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
A) Marketing and customer relationship management					
1. Creation and development of customer relationships	4,2	0,8	5	3	5
2. Marketing and advertising activities	4,1	0,8	5	3	5
3. Management of the marketing chain (and its processes)	3,8	0,8	4	3	5
4. Systematic marketing planning	3,1	0,7	3	2	4
5. Use of indirect marketing channels	3,3	0,7	3	2	5
6. Marketing legislation and legal issues	3,1	1,3	2	1	5
B) Strategic management and business process development					
1. Strategic business management	4,1	1,1	5	2	5
2. Information management and process integration	3,9	0,9	4	2	5
3. Monitoring, evaluation and development of business	3,9	0,8	3	3	5
4. Human resource management	3,5	0,9	4	2	5
5. Strategic cooperation, partnerships etc.	3,7	1,0	4	2	5
6. Industry-specific knowledge	3,5	0,8	4	2	5
C) Technical qualifications and logistics					
1. Information and net security	4,1	0,8	4	3	5
2. Payment systems and monetary transactions	3,9	0,8	3	3	5
3. Logistics and delivery of goods	4,2	0,7	4	3	5
4. Development of e-commerce sites	3,6	0,7	4	2	5
5. Technical system integration	3,9	0,8	3	3	5
6. Mobile and wireless technologies	3,3	0,8	3	2	5
D) Innovations and product development					
1. Marketing and product innovations	4,0	0,8	4	3	5
2. Technical and business innovations	4,3	0,8	5	3	5
3. Implementation and process innovations	4,0	0,9	4	2	5
4. Organisational innovations	3,4	0,9	3	2	5

EXPERTS:

Long term

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
A) Marketing and customer relationship management					
1. Creation and development of customer relationships	4,6	0,6	5	3	5
2. Marketing and advertising activities	4,2	0,8	4	2	5
3. Management of the marketing chain (and its processes)	4,9	0,4	5	4	5
4. Systematic marketing planning	4,2	0,8	4	3	5
5. Use of indirect marketing channels	3,4	1,1	4	2	5
6. Marketing legislation and legal issues	3,8	1,1	5	2	5
B) Strategic management and business process development					
1. Strategic business management	4,7	0,5	5	4	5
2. Information management and process integration	4,5	0,6	5	3	5
3. Monitoring, evaluation and development of business	4,1	0,7	4	3	5
4. Human resource management	4,0	0,9	4	2	5
5. Strategic cooperation, partnerships etc.	4,0	1,0	5	2	5
6. Industry-specific knowledge	3,9	0,8	4	2	5
C) Technical qualifications and logistics					
1. Information and net security	4,5	0,7	5	3	5
2. Payment systems and monetary transactions	3,9	1,0	5	2	5
3. Logistics and delivery of goods	4,3	0,9	5	3	5
4. Development of e-commerce sites	3,8	0,8	4	2	5
5. Technical system integration	4,5	0,6	5	3	5
6. Mobile and wireless technologies	4,7	0,5	5	4	5
D) Innovations and product development					
1. Marketing and product innovations	4,4	0,6	4	3	5
2. Technical and business innovations	4,5	0,7	5	3	5
3. Implementation and process innovations	4,2	0,8	5	3	5
4. Organisational innovations	3,7	0,9	4	2	5

REPRESENTATIVES OF ENTERPRISES:

Short term

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
A) Marketing and customer relationship management					
1. Creation and development of customer relationships	4,3	1,3	5	1	5
2. Marketing and advertising activities	4,2	1,0	5	2	5
3. Management of the marketing chain (and its processes)	3,9	1,1	5	2	5
4. Systematic marketing planning	3,0	1,5	3	1	5
5. Use of indirect marketing channels	3,2	1,5	2	1	5
6. Marketing legislation and legal issues	2,9	1,3	3	1	5
B) Strategic management and business process development					
1. Strategic business management	4,1	1,4	5	1	5
2. Information management and process integration	3,8	1,2	4	1	5
3. Monitoring, evaluation and development of business	4,1	1,3	5	1	5
4. Human resource management	2,9	1,6	2	1	5
5. Strategic cooperation, partnerships etc.	3,3	1,1	3	1	5
6. Industry-specific knowledge	3,5	1,5	5	1	5
C) Technical qualifications and logistics					
1. Information and net security	3,5	1,5	5	1	5
2. Payment systems and monetary transactions	3,1	1,4	3	1	5
3. Logistics and delivery of goods	3,5	1,5	5	1	5
4. Development of e-commerce sites	3,6	1,1	3	2	5
5. Technical system integration	3,2	1,5	4	1	5
6. Mobile and wireless technologies	2,5	1,3	2	1	5
D) Innovations and product development					
1. Marketing and product innovations	3,6	1,3	5	1	5
2. Technical and business innovations	3,3	1,4	3	1	5
3. Implementation and process innovations	3,1	1,4	3	1	5
4. Organisational innovations	2,3	1,2	2	1	5

REPRESENTATIVES OF ENTERPRISES:

Long term

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
A) Marketing and customer relationship management					
1. Creation and development of customer relationships	4,7	0,7	5	3	5
2. Marketing and advertising activities	4,6	0,5	5	4	5
3. Management of the marketing chain (and its processes)	4,6	0,5	5	4	5
4. Systematic marketing planning	3,9	1,1	5	2	5
5. Use of indirect marketing channels	4,0	0,9	4	2	5
6. Marketing legislation and legal issues	3,6	1,3	5	2	5
B) Strategic management and business process development					
1. Strategic business management	4,3	1,1	5	2	5
2. Information management and process integration	4,1	0,9	4	2	5
3. Monitoring, evaluation and development of business	4,5	0,7	5	3	5
4. Human resource management	3,3	1,4	2	2	5
5. Strategic cooperation, partnerships etc.	3,7	0,7	4	3	5
6. Industry-specific knowledge	4,1	1,2	5	2	5
C) Technical qualifications and logistics					
1. Information and net security	4,1	1,0	5	3	5
2. Payment systems and monetary transactions	3,8	1,0	4	2	5
3. Logistics and delivery of goods	3,7	1,6	5	1	5
4. Development of e-commerce sites	4,3	0,9	5	3	5
5. Technical system integration	3,6	1,6	5	1	5
6. Mobile and wireless technologies	3,7	1,5	5	1	5
D) Innovations and product development					
1. Marketing and product innovations	4,0	1,4	5	1	5
2. Technical and business innovations	3,8	1,4	5	1	5
3. Implementation and process innovations	3,6	1,6	5	1	5
4. Organisational innovations	2,8	1,3	2	1	5

APPENDIX 7: Statistical information of the distribution of the answers on the ability of different forms of education and training to respond to the qualification requirements

EXPERTS:

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
1. Universities	3,9	0,6	4	3	5
2. Polytechnics	3,9	0,8	4	2	5
3. Basic vocational education	3,0	1,0	3	1	4
4. On-the-job learning systems	3,4	1,1	4	2	5
5. Apprenticeship contract	3,2	1,1	3	2	5
6. Tailored training programmes in an enterprise	3,7	0,8	4	2	5
7. Learning courses outside an enterprise	3,0	0,6	3	2	4
8. Virtual or net-based learning	2,8	1,0	2	1	4
9. Mutual training for enterprises in one business sector	3,3	0,6	3	2	4
10. Mutual training for enterprises in different business sectors	3,2	0,8	3	2	5
11. Self-learning of individuals	3,0	1,0	4	1	4

REPRESENTATIVES OF ENTERPRISES:

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
1. Universities	3,2	1,5	2	1	5
2. Polytechnics	3,4	1,3	4	1	5
3. Basic vocational education	3,0	1,1	3	1	5
4. On-the-job learning systems	2,3	0,9	2	1	4
5. Apprenticeship contract	3,8	0,9	3	3	5
6. Tailored training programmes in an enterprise	3,4	0,7	3	3	5
7. Learning courses outside an enterprise	2,7	1,1	3	1	5
8. Virtual or net-based learning	3,6	1,0	4	2	5
9. Mutual training for enterprises in one business sector	2,7	0,8	2	2	4
10. Mutual training for enterprises in different business sectors	2,9	0,7	3	2	4
11. Self-learning of individuals	3,9	1,0	4	2	5

APPENDIX 8: Statistical information of the distribution of the answers on the suitability of different forms of acquiring qualifications

EXPERTS:

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
1. Recruitment of new qualified personnel	4,1	1,0	5	2	5
2. Training of existing personnel	3,8	0,8	4	2	5
3. Buying of specialised services	3,8	0,6	4	3	5
4. Individual learning of employees	3,2	0,8	3	2	4
5. Cooperation projects with institutions	3,4	1,0	3	2	5
6. Use of students as sources of new knowledge	3,2	0,9	3	2	5
7. Support from enterprise unions	2,4	0,7	2	1	4
8. Cooperation with customers	3,9	1,0	4	1	5
9. Cooperation with other enterprises	3,6	0,9	4	2	5
10. Cooperation with international cooperative partners	3,9	1,0	5	2	5
11. Cooperation with experts	4,0	0,7	4	3	5
12. Use of consultants	3,6	0,6	4	2	4

REPRESENTATIVES OF ENTEPRISES:

	MEAN	STANDARD DEVIATION	MODE	MIN	MAX
1. Recruitment of new qualified personnel	3,8	1,0	3	2	5
2. Training of existing personnel	4,0	1,3	5	1	5
3. Buying of specialised services	3,9	1,4	5	1	5
4. Individual learning of employees	3,9	1,3	5	1	5
5. Cooperation projects with institutions	3,0	1,2	3	1	5
6. Use of students as sources of new knowledge	2,9	1,1	3	1	4
7. Support from enterprise unions	3,0	1,2	4	1	4
8. Cooperation with customers	3,5	1,2	3	1	5
9. Cooperation with other enterprises	3,6	0,7	3	3	5
10. Cooperation with international cooperative partners	3,3	1,1	3	1	5
11. Cooperation with experts	3,7	1,1	3	2	5
12. Use of consultants	2,7	1,3	2	1	5