LogOnBaltic

ICT SURVEY IN SOUTHWEST FINLAND

**Juha Läikkö and
Tomi Solakivi**

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EXECUTIVE SUMMARY

This survey examines the status of ICT usage in companies and public organisations in Southwest Finland. The survey is made to give better understanding of the regional situation in Information and Communication Technology (ICT) utilization and to find out how the companies could enhance the usage of the available technologies. The survey is part of the LogOn Baltic project.

The survey is based on five different main themes:
- general information of the company
- use of ICT systems
- use of Internet
- e-commerce and e-business
- general assessment of ICT usage

The survey received 508 responses throughout Southwest Finland. 466 of the responses came from micro- and small-sized companies which reflect many of the results in the survey. The respondents were divided into four different categories according to their branch; Manufacturing (127), Trading (56), Logistic service providers (35) and "Others" (290). Most of the responses were given by people from the Senior Management (346) and Middle Management (50).

There is a very high broadband penetration within the companies in Southwest Finland. The majority of the companies provide the entire workforce with an e-mail account and Internet access. Web sites can be found in over 75% of the companies (10% above average in Finland) although many of the respondents consider building and maintaining Web site expensive.

The level of ICT implementation in different business areas is not extremely high in Southwest Finland. A clear majority of respondents consider general ICT expenditure too high, although most of the companies spend less than 2.5% of their annual turnover to ICT costs (IT personnel, hardware and software). The results of the study also show that especially in micro and small companies the level of know-how in ICT is relatively low. On the other hand the level of know-how is considered rather high within larger companies. One quarter of the companies are benchmarking their competitors regularly and almost

half of them regularly monitor and evaluate their own IT costs and performance.

Many of the companies neglect Internet security concerns entirely by lacking suitable virus protection and firewall application. On the other hand some companies are too afraid of using the systems, even e-mail because of the possibility of getting viruses, spywares and other malicious software. Practical training and education on data security is given in roughly 30% of the companies. Own documented data security programmes can be found only in a bit over 15% of the companies.

In general the companies agree on the importance and potential given by e-commerce. Most of the companies believe that e-commerce will help them reach new suppliers and customers. Most of the respondents also agree on that e-commerce simplifies business transactions and has major impact on profitability.

The utilization of electronic services provided by local authorities and government is moderate. Around 50% of the companies obtain information, download and complete forms online. Online payments to government organisations are performed by approximately 35% of the companies. The percentage is rather low considering the possibilities and general level of e-banking usage in Finland.

TIIVISTELMÄ

Tämä tutkimus on osa LogOn Baltic projektia. Alueellisen ICT - tutkimuksen tarkoitus on selvittää Varsinais-Suomen alueen yksityisen ja julkisen sektorin organisaatioiden tieto- ja viestintäteknologian käyttöä. Tutkimuksen on tarkoitus antaa tietoa missä määrin yritykset käyttävät hyväksi olemassa olevia ratkaisuja ja mikä on yritysten yleinen kompetenssi ICT:n käytössä.

Kysely koostuu viidestä aihealueesta:

- Yleiset tiedot
- ICT – järjestelmien käyttö
- Internetin käyttö
- Sähköinen kaupankäynti
- ICT:n käytön yleinen arviointi

Kyselyyn saatiin yhteensä 508 vastausta, joista kaikkiaan 466 kappaletta tuli mikro- ja pienyrityksiltä. Yritykset luokiteltiin neljään ryhmään liiketoiminnan mukaan; valmistavat yritykset (127), kaupan ala (56), logistiikan palveluntarjoajat (35) ja muut (290). Suuri pienten yritysten määrä otannassa heijastuu tutkimuksen tuloksiin.

Varsinais-Suomen alueen yrityksistä selvällä enemmistöllä (92.8%) on käytössään laajakaistayhteys ja yli 75 prosentilla omat kotisivut, joka on noin kymmenen prosenttia koko valtakunnan tasoa korkeampi. Yleisesti verkkosivujen rakentamisen ja ylläpitämisen kustannuksia pidetään melko korkeina, vaikka markkinoilla on tarjolla erittäin edullisia vaihtoetoja. Pääasiallisesti verkkosivuilla esitellään yritystä yleisellä tasolla ja kerrotaan sen tuotteista ja palveluista.

Eri liiketoimintoja tukevien ohjelmistojen käyttö ei ole erityisen korkeaa Varsinais-Suomen alueen yrityksissä. Eniten sovelluksia käytetään kirjanpidon, rahoituksen ja myynnin sekä markkinoinnin toiminnoissa. Suurin osa vastaajista pitää tieto- ja viestintäteknologiaan kohdistuvia kuluja liian korkeina. Enemmistö yrityksistä käyttää alle 2.5 prosenttia vuotuisesta liikevaihdostaan ICT-kuluihin. Lähes puolet yrityksistä seuraa ja arvioi säännöllisesti omia IT-kulujaan ja - suorituskykyään. Noin neljäsosa vertaa omaa IT-suorituskykyään kilpailijoihin nähden säännöllisesti.

Työntekijöiden tieto-taito -taso tieto- ja viestintäteknologian käytössä nähdään melko matalaksi mikro- ja pienyrityksissä. Keskisuurissa ja

suuryrityksissä tieto-taito -taso nähdään melko korkeaksi. Syyn voidaan olettaa johtuvan pienempien yritysten järjestämän koulutuksen puutteesta.

Monet yrityksistä laiminlyövät tietoturvallisuuden täysin jättämällä tietoisesti käyttämättä virusturvaa tai palomuuria tietokoneissaan. Noin kolmasosa yrityksistä järjestää henkilöstön tietoturvakoulutusta ja oma dokumentoitu tietoturvaohjelma löytyy noin 15 prosentilta yrityksistä. Aiempien tutkimusten mukaan käyttäjien puutteellinen taitotaso tietokoneen käytössä on suurin tietomurtojen ja vahinkojen aiheuttaja.

Elektronisen kaupankäynnin luomat mahdollisuudet on ymmärretty melko hyvin yritysten keskuudessa. Yleisesti ottaen yritykset uskovat elektronisen kaupankäynnin yksinkertaistavan liiketoimintoja, sekä tuovan mahdollisuuksia tavoittaa uusia tavarantoimittajia ja asiakkaita. Elektronisen kaupankäynnin katsotaan myös vaikuttavan huomattavasti yrityksen kannattavuuteen.

Hieman yli puolet yrityksistä hankkii tietoa säännöllisesti Internetin avulla viranomaisilta tai valtionhallinnolta. Eri instanssien tarjoamia sähköisiä lomakkeita käyttää niin ikään noin puolet yrityksistä. verkkomaksuja valtionhallinnolle suorittaa vain hieman yli kolmannes yrityksistä. Tulos on heikko ottaen huomioon, että suomalaisten pankkien tarjoamat verkkopankkijärjestelmät ovat maailman mittakaavalla erittäin tasokkaita ja niiden käyttö yleisellä tasolla mittavaa.

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1.1 Project introduction – LogOn Baltic

The LogOn Baltic project was approved within the Baltic Sea Region (BSR) INTERREG III B Neighbourhood Programme, which is sponsored by the European Regional Development Fund (ERDF), as part of the Structural Funds, and co-financed by national project partners.

The purpose of LogOn Baltic is to present solutions to improve the interplay between logistics and Information and Communication Technologies (ICT) competence and spatial planning and strengthening Small and Medium-sized Enterprises (SMEs) competitiveness in the BSR. This is primarily done by the production and dissemination of information for regional development agencies on how to support enterprises in the participating regions in the field of ICT and logistics, thus improving regional development.

The following regions are participating in the project:
- South-West Finland
- Östergötland (Sweden)
- Denmark
- Southern Metropolitan Region of Hamburg (Germany)
- West-Mecklenburg (Germany)
- North-East Poland
- Lithuania
- Latvia
- Estonia
- St. Petersburg (Russia)

LogOn Baltic provides an overview of logistics efficiency and logistics information systems and their exploitation, in order to improve the interaction between SMEs and other public/private actors.

On the one hand, the empirical activities of LogOn Baltic compare the existing logistics services and infrastructure with the logistics needs in the participating regions, making it possible to develop perspectives and action plans for strengthening the logistics competence in the

regions. On the other hand it describes the existing ICT infrastructure and services, revealing up to what extent they meet with the companies' needs for further development. In this way, LogOn Baltic focuses on:

- a. identifying development agencies and evaluating their performance in each region
- b. evaluating the level of logistics and ICT efficiency
- c. suggesting concrete actions for regional and local public sector bodies

Data are gathered in each participating region using four tools, Development Measure Impact Analysis (DEMIA), Logistics survey, ICT survey and Expert Interviews; each of these is presented in a separate report. These results together with secondary data is presented in a regional report, that will describe the state of affairs in the region, with recommendations on what and how the region needs to develop. The regional reports are used as a basis for making an interregional comparison which is reported in an inter-regional report. All reports are available on the project homepage, www.logonbaltic.info.

1.2 Regional partner introduction

The regional partners in Finland are:

- Turku School of Economics (Lead Partner)
- Development Centre of Salo Region
- ICT Turku Ltd
- Loimaa Regional Development Centre
- Pilot Turku Ltd
- Regional Council of Southwest Finland
- TEDIM Telematics, Education, Development and Information Management
- Turku Region Development Centre
- University of Turku, Department of Geography

Turku School of Economics (TSE) is a public university in the field of business science. Project management is with the TSEBA Logistics (staff of 15), with extensive research and policy-making experience. Other contributing units comprise SME Institute, Pan-European Institute specialising in Russian markets & Finland Futures Research Centre, researching alternative futures and related challenges/opportunities in policy making, including regional planning

foresight studies. TSE Project Unit has worked in over 100 EU co-funded projects.

Development Centre of Salo Region is an organisation owned by 11 municipalities. It provides regional development and co-operation related services for its owners. It consists of units of regional development, enterprise services and municipality services. It benefits from the project through information on possibilities to develop logistics and ICT competence in the region with a strong telecommunications industry cluster. It serves as dissemination and data collection channel with local businesses. Logistics-related spatial planning is one of its current key priorities

ICT Turku Ltd. is part of Turku Science Park and a cluster focused on information and communications technology. The goal of ICT Turku is to develop the ICT cluster in Southwest Finland into an internationally successful entity of actors. The goal of ICT Turku is perfectly in line with the project objectives. It has a network comprised of more than 1,400 companies and units of the ICT field which will be used as dissemination and data collection channel. ICT Turku has participated in Interreg II C projects, E-18 co-operation and Baltic Palette.

Loimaa Regional Development Centre is a business service unit owned by 10 municipalities. It works with regional development and aims at enhancing preconditions for a diverse business environment. It gets rigorous information about the possibilities to develop logistics and ICT competence in the semi-rural region and serves as dissemination and data collection channel to the local businesses. Logistics-related spatial planning is one of its current key priorities.

Pilot Turku Ltd is a development company owned by the City of Turku. It focuses on promoting the international logistics operations in the Turku Region. The purpose of the organisation is to provide the customers with a single service channel for contacting all decision-makers and actors, thus lowering the thresholds of language, culture and bureaucracy. Pilot Turku provides its logistics competence and contacts to the project. It also serves as a dissemination channel and data collection channel to the local businesses. They have previously participated in Interreg projects, NeLoC and InLoC.

Regional Council of Southwest Finland is a joint municipal authority which functions in accordance with the principles of municipal self-government, operating as the authority on regional development as well as the region's planning and lobbying organisation. In LogOn Baltic especially, the Regional Council's knowledge on the regional

spatial planning will be an essential part. The Council also is a direct connection to other local authorities and policy makers. At the moment they are hosting the South Finland Coastal Zone Interreg III A Programme.

TEDIM is a joint organ of the Ministries of Transport around the Baltic Sea. It is a development forum for (i) logistics co-operation between the EU and Russia, as well as between the EU Member States; (ii) dissemination of best practices in transport and logistics; and (iii) use of telematics in transport and logistics. A hallmark of TEDIM projects is a unique co-operation between private and public sector. TEDIM joins as an advisory partner with the main task to reach out to all Ministries of Transport in the BSR with LogOn Baltic results.

Turku Region Development Centre is a public development organisation comprising 18 municipalities in Southwest Finland. TAD Centre's main objective is to create an environment that promotes dynamic enterprise activities in Turku region and to co-ordinate business policies in the region. TAD Centre participates and co-ordinates strategic development projects to support and create the growth in the region, including many logistics and ICT projects. TAD Centre has been a partner in several EU projects, including Interreg project the Baltic Business Network, and ESR project HighTech Way.

Department of Geography at University of Turku brings research competence on regional planning and GIS-analysis into the project. The Department's extensive applied research provides society with specific regional knowledge to fulfil the needs of planning and decision-making. Urban geography is one of the strongest fields of research, including different research programmes of future urban developments and urban renewal processes, so this is an opportunity to exploit the knowledge in practice.

1.3 ICT survey introduction

This survey – part of the LogOn Baltic project - is one of the tools for primary data collecting. It aims at reflecting the use of ICT as interface between the private and public sector. It is also intended to describe the existing ICT infrastructure and services in the participating regions, revealing up to what extent they meet with the companies' needs for further development.

The questionnaire consists of five modules. Each region has the opportunity to add one or two questions focusing on specific regional

issues. These additional questions were added in an extra module (Module F). The same questionnaire has been used in all regions.

The survey is mainly conducted as a web-based survey, but mail surveys, phone surveys and interviews have also been used as a complement in some regions.

This is by far the largest survey conducted in the Baltic Sea Region in the field of ICT. In this report, data and analysis will be presented for one region only.

The data is also used to make a cross-regional analysis, focusing on differences and similarities between the regions. The cross-regional analysis is presented in a separate report available at the project homepage, www.logonbaltic.info.

2   SURVEY DESIGN

2.1 Target group and sample

Most of the companies responding to this survey belong to the group of micro companies with a turnover less than two million euros. From a total of 508 respondents, 390 belong to this group. The second largest group with 76 respondents are the small companies, with a turnover between 2-10 million euros. Medium sized companies with turnover between 10-50 million euros are represented with 27 companies. The smallest group - with 15 respondents - are the large companies. Large companies have a turnover of more than 50 million euros per year.
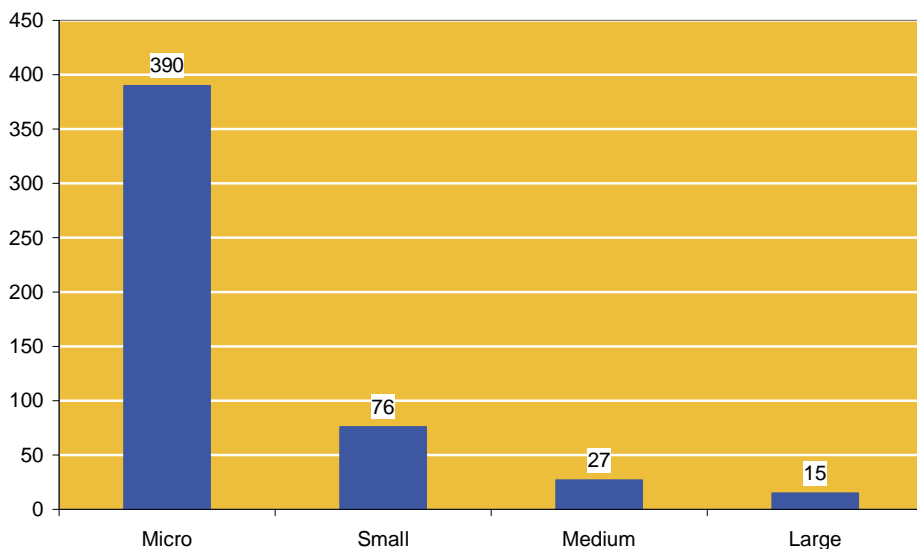
Figure 1   Number of respondents according to company size

The respondents were categorized in five groups according to their position in the company. The largest group belonged to the Senior Management with 346 responses. The number of micro- and small-sized companies affects this result because most of the owners of

micro and small companies have responded to the survey themselves. Roughly 90% of the respondents in this group are from micro or small sized companies. 50 of the respondents belong to the Middle Management; 22 of the respondents belong to operational staff and 21 to expert group. 43 answers belonged to "Others".
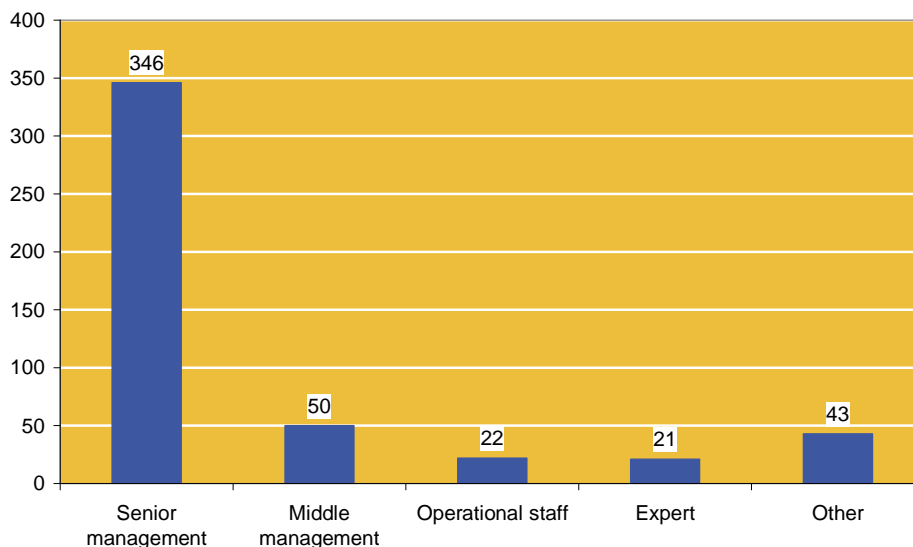
Figure 2   Number of respondents according to respondents' position in the company

In this survey all 508 companies were divided into four groups according to main industry. Most of the companies belonged to the group "Other". The group of 290 companies consists of service providers like law firms, advertising agencies, engineering offices, health care services, consulting firms, accounting companies, etc. The second largest group - with 127 companies - is the manufacturing industry. This group consists i.e. of maritime industry, metal working companies, component and textile manufacturers and food industry. Third largest group in the area is the trading industry, with 56 wholesale and retail companies. The remaining 35 companies from the logistics service providers industry represent the smallest group.
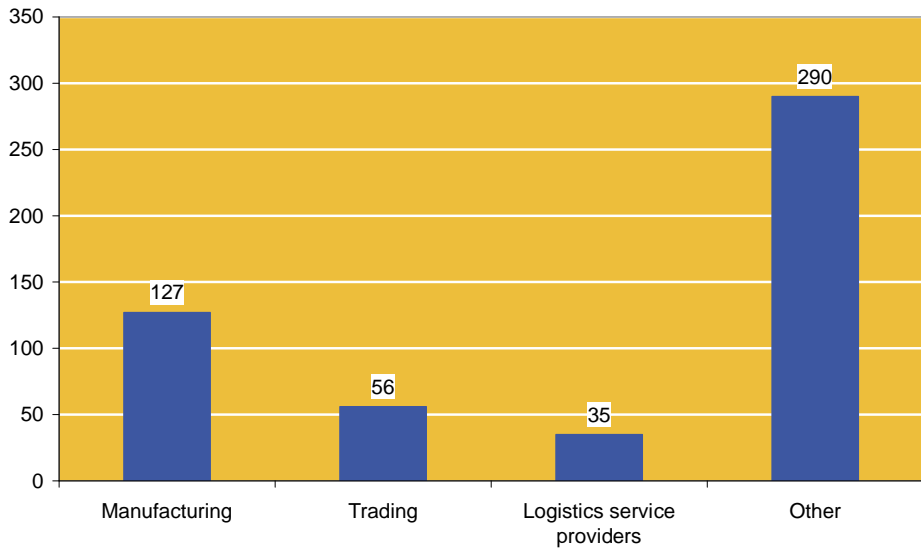
Figure 3   Number of respondents according to main industry

2.2 Main themes of the survey

The ICT Survey consists of five mandatory modules (A – E), and an optional module for region-specific questions. The main themes of the survey are:

- General contact- and background information of the companies
- Use of ICT in the companies within the regions
- Use of the Internet in the companies within the regions
- E-commerce / E-business
- General assessment of the use of ICT in the regions
- Region-specific issues [optional module]

The ICT Survey is intended for the whole population of regional companies.

3 FINDINGS FROM THE SURVEYS

3.1 Use of ICT systems

Contacting and making business transactions via Internet and e-mail is very common nowadays. Almost every company has the hardware and connections to use these systems and to make use of the available possibilities. Figure 4 shows that there is a very high Internet accessibility within the companies. 68.3% of the companies give their employees a company e-mail account and 76.5% of them give Internet access for more than 75% of their employees. These companies are mainly micro companies concentrating in service business where the work is partly done with computers (Refer to Figures 1 and 3).
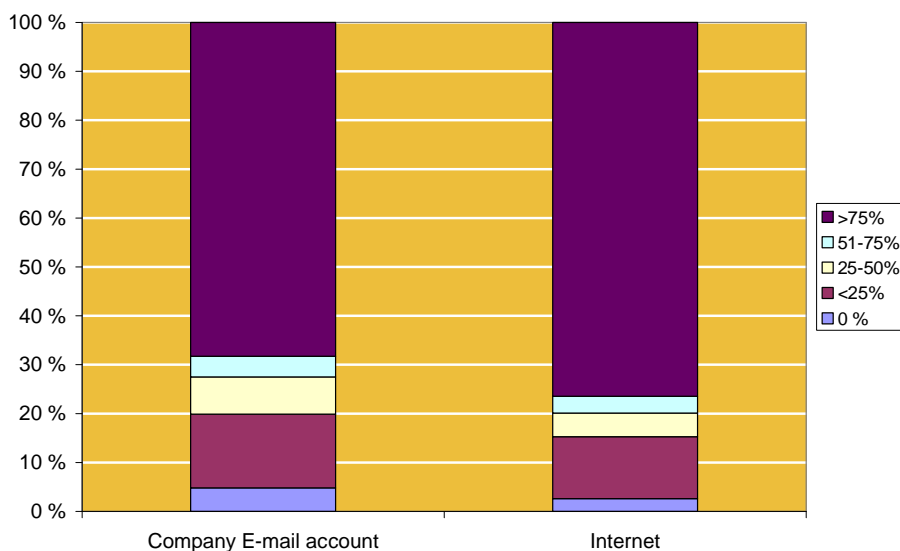
Figure 4   How many percent of employees have access to E-mail and Internet

4.2% of the companies give company e-mail account and 3.4% Internet access to 51-75% of their employees. 7.6% of the companies

give company e-mail account and 4.8% Internet access to 25-50% of their employees.

15.1% of the companies give company e-mail account and 12.7% Internet access to less than 25% of their employees. In these companies the majority of the employees do physical work instead of working with computers.

4.8% of the companies don't provide a company e-mail account at all, and 2.6% don't provide Internet access to their employees. These companies are micro companies from different branches, from construction to health service.

To the sub question: *"If any option was answered with 0 %, does the company plan to give access to company E-mail account/Internet to the employees in the future?"* the companies answered as follows: 48% of the companies plan to give access and 52% are not willing to give access to their employees in the future.
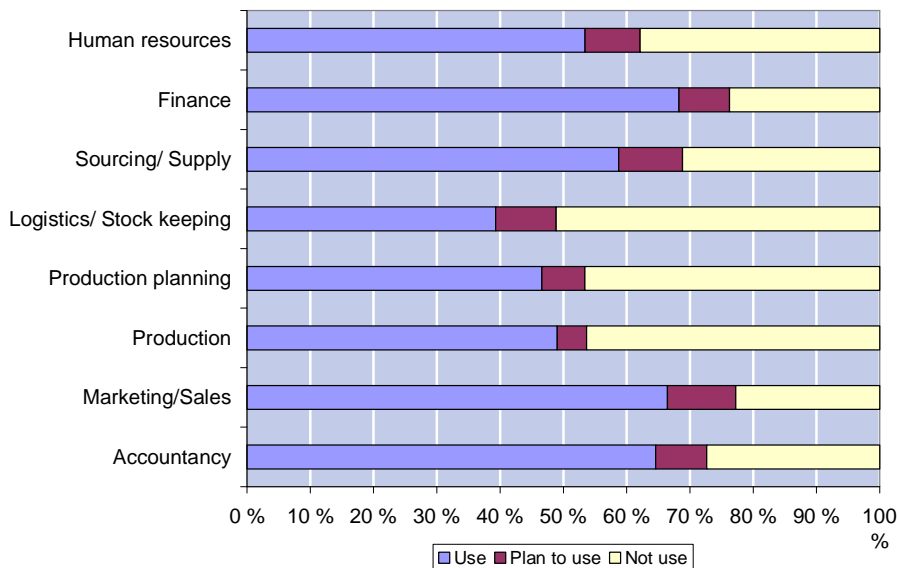
Figure 5 On which areas of business the companies are using ICT

Figure 5 shows that the level of ICT usage in different areas of business within the companies in Southwest Finland is not extremely high. This result may be warped from the fact that most of the companies participating in this survey are micro and small sized companies. These companies have neither the financial resources nor the needs to have as many functions in their applications as the larger

companies. Roughly 5-10% of the companies are planning to use ICT in some new areas of business in the future.

A solution to get all these features in one system is ERP. Enterprise Resource Planning (ERP) systems are comprehensive ICT systems that integrate all data and processes of a company. ERP can be used in multiple modules (Finance, Supply Chain, Human Resources, Customer Relationship Management, Manufacturing and Warehouse) or just some of them. The most well known ERP system providers are SAP and Oracle.

66.1% of the companies in this survey use ICT in Accounting. 8.0% are planning to use accounting applications in the future and 25.8% are not using or going to use any.

There are several easy-to-use and affordable accounting applications in the market to help the job. The best known and most used Finnish accounting applications are Passeli and Datamike. There are also low cost web based services like Procountor.

Micro companies often hire accounting companies to do their accounting. Reason for that is the lack of know-how in accounting issues and saving time for other critical tasks that can be done by themselves. It is much easier to take the bills to an accounting company and let the professionals handle everything. Hiring an employee to take care of the company accounting is usually too expensive for a micro company.

67.6% of companies use ICT in Marketing and Sales, and 10.2% are planning to use ICT. 22.2% of the respondents are not using ICT in this business area at all.

The most common ways to exploit ICT in Marketing and Sales are company web-pages, extranets and banners on other web pages. Sending e-mail to existing and potential customers is also a very common way to inform customers about the company. There are also several kinds of company directory services in the World Wide Web (WWW).

More advanced systems like marketing information systems provide information that relates to the firm's marketing activities. These systems provide information gathered from the critical elements in marketing like prices, distribution, products and selling activities.

ICT can be used in the area of Production to report on subjects like inventory, costs and quality. 50.6% of the respondents use ICT in Production, and an additional 4.6% are planning to use ICT. 44.8% of the companies are not going to use ICT in Production. This result is quite interesting because approximately 25% of the companies are

pure manufacturing companies (refer to Figure 3.). Service based companies can use ICT in their "Production" as well, but in the sense of producing pure physical products this result is warped.

Production planning systems are used in 47.9% of the cases, and 7.2% are planning to acquire one of these systems. 44.9% of the companies are not using ICT in Production Planning.

40.7% of the surveyed companies are using logistics and/or stock keeping systems in conducting business. 9.3% are planning to, and half of the respondents are not going to use such a system.

Logistics information systems have improved a lot in the past. Automated stock keeping and inventory systems, parcel tracking systems, Radio Frequency Identification (RFID), navigation systems etc. can help companies make their business more efficient in many ways.

60% are using Sourcing and Supply systems in their business. 9.5% are planning to use such a system in the future. 30.5% are not going to use systems in this area of business. Especially the manufacturing and trading companies use ICT in Sourcing and Supply for example in estimating customer demand and inventory.

Financial information systems provide information about the company's financial activities. These systems help company managers forecast future economic trends, manage the cash flow through the company and control the company finances.

69.8% are using ICT when handling company finance issues. 7.8% are planning to use ICT in finance issues in the future. 22.4% are not using any kind of applications or technology in company finance. The percentage of companies using financial applications is rather high and indicates good understanding of the importance in finance handling within the smaller companies as well.

Human Resources (HR) information systems provide information concerning the company's human resources. These systems help in matters such as planning, recruiting and managing the workforce.

54.1% of the companies use human resource applications and 8.9% are planning to use such applications. 37% of the respondents are not using ICT in Human Resources. The amount of micro and small companies with only one or few employees affects this result, because these companies rarely need HR applications.

20.1% of the respondents use and 3.4% are planning to use other types of technologies in addition to those above. 76.5% of the companies are not going to use any other kind of technologies than those given in the survey.

The "other" ICT systems are i.e. video conferencing systems, Virtual Private Networks (VPN), post tracking systems, courier service tracking systems, travel agency booking system, etc.

3.2 Use of ICT administration

Around 16% of the surveyed companies have their own IT department. These are mostly medium and large companies. There are some small companies that have their own IT department, but their core business is software development or providing IT services.
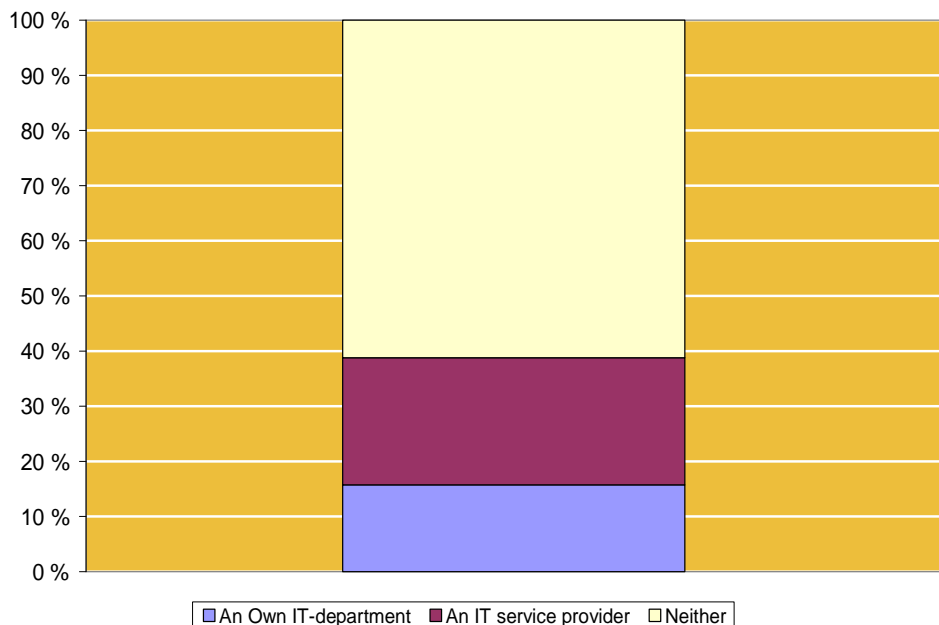
Figure 6   How the ICT administration is handled in the companies

IT service provider is an alternative for having an own IT department, especially when the core business is far away from IT, but the systems are vital for the company to function. For example advertising agencies, law firms and private doctor's offices need to have a server to run all their data, but they do not necessarily need a full-timer to maintain the servers. Nearly 23% of the respondents use an IT service provider to maintain their systems and servers. Most of these companies also belong to the group of medium and large companies. Some small sized companies also use a service provider for their IT functions.

Over 60% of the respondents do not have their own IT department or use an IT service provider. This is logical because most of the respondents are micro and small sized companies.

Figure 7 shows the percentage of company turnover that is used in IT personnel, software and hardware.
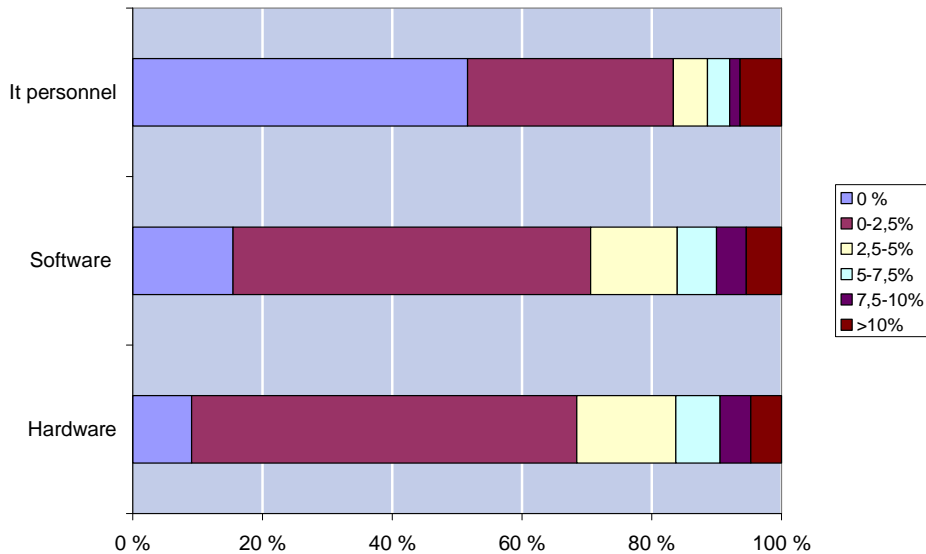
Figure 7   ICT expenses as a percentage of company turnover

A large majority of the companies use less than 2.5% of their annual turnover for ICT expenses. However, there are quite many law firms, advertisement agencies and accounting firms that use over 10% of their annual turnover for IT personnel, software and hardware. There are also ICT service providers in the group, which is expected, because these companies base their business to computer hardware, and therefore use big amounts of money for computer related acquisitions.

51.6% of the companies did not have any IT personnel costs last year. This is clearly due to the fact that micro companies dominate the results in this survey. The smaller companies hardly ever need own IT personnel and they do not easily use the services provided by IT consulting firms. The reason for this is mainly the high costs the consulting firms have and the little need of IT related issues.

31.7% of the companies used 0-2.5% of their annual turnover for IT personnel.

5.3% of the companies used 2.5-5% of their annual turnover for IT personnel.

3.4% of the companies used 5-7.5% of their annual turnover for IT personnel.

1.6% of the companies used 7.5-10% of their annual turnover for IT personnel.

6.4% of the companies used over 10% of their annual turnover. These companies are mainly software companies and IT service providers. Own IT personnel are mostly needed by medium and large companies.

18.3% of the respondents did not spend any money to buy new software last year. 65.2% of the companies spent 0-2.5%, and 15.8% of the companies spent 2.5-5% of their annual turnover for computer software acquisitions.

7.2% spent 5-7.5%, while 5.4% spent 7.5-10% of their annual turnover for software last year.

6.4% of the companies spent more than 10% of their annual turnover for software acquisitions last year. Mostly these companies operate in the field of ICT and telecommunications.

Many of the companies that spend more than 10% of their turnover for hardware also spend over 10% for software. This group of companies clearly need high performing computers and delicate software for their business.

Computer hardware is usually updated in a few-years-cycle, maybe even not that often. The performance of a few years old computer is good enough to run common latest software. The problems may arise when the operating systems are updated to new ones in older computers.

59.4% of the companies in this survey spent 0-2.5% of their turnover for computer hardware last year. Approximately 9.1% of the respondents did not make any hardware purchases last year.

15.3% of the companies spent 2.5-5% of their annual turnover for hardware acquisitions.

6.8% of the companies spent 5-7.5% of their annual turnover for hardware acquisitions.

4.7% of the companies spent 7.5-10% of their annual turnover for hardware acquisitions.

4.7% spent more than 10% of their annual turnover for computer hardware. Most of the companies in this group have ICT and telecommunication as core business, but also service based

companies like consultants, architects, lawyers and advertising agencies.

Hardware performance is growing, but radical changes are not to be expected in the near future. The prices of computers and peripherals have generally been decreasing in the past decade as the performance has increased in the same period.

67% of the respondents believe that their hardware costs are going to remain constant; 24.8% believe the costs are going to increase, and 8.2%, that the costs will decrease.

Table 1   How the ICT-costs are expected to develop in the next 3 years

	Decrease	Remain constant	Increase
Hardware	40	328	121
Software	36	294	159
IT personnel	23	359	60

System and application software are normally acquisitions that last for many years. New versions are introduced every few years, whereas the older versions are also operational but may lack some features the new ones have.

60.1% of the companies believe the software costs are going to remain the same in the next three years; 32.5% believe the costs are going to increase, and 7.4 believe the costs are going to decrease.

81.2% of the respondents believe their IT personnel costs are going to remain constant; 5.2% believe the costs will decrease, and 13.6% believe they will increase.

Referring to figure 7, over half of the companies did not have any IT personnel costs in the past year. This result indicates that the companies are generally well prepared for the future or do not see a need for assistance with ICT related issues.

3.3 Use of data security measures

The level of awareness of data security related issues seems to be somewhat low in the companies in Southwest Finland. From a security perspective many companies seem not to have a good understanding of the threats they might be facing when lacking the support of the factors in table 2.

Table 2   The use of different data security measures

	Available	Regularly used/ updated
Password access control	333	202
Virus protection applications	359	264
Computer firewall applications	352	252
Employee education on data security	161	69
Own documented data security program	82	39

333 of the companies have password access control to computers and 202 of them regularly use and update them.

Studies revealed that users' lack of knowledge is the single greatest cause of network security breaches. Many users forget their passwords or give them to a colleague which causes problems. Passwords must be complex and changed frequently, at least every two or three months. Password requirements should be complex enough to prevent unauthorized use of the company systems. Attacks from malicious spywares and hackers can also be better prevented if the passwords are difficult enough.

359 of the companies have virus protection applications running on their computers, and 264 of them use and update these applications regularly.

Virus protection is crucial in keeping unwanted applications from accessing and running in the company computers and information systems. Virus protection should be running all the time and the latest updates must be downloaded and installed immediately. Many applications download and install the newest updates itself. Virus check should also be run on weekly basis.

352 companies use computer firewall applications and 252 use and update them regularly.

Computer firewall applications are as crucial as virus protection systems in preventing unauthorized access and breaks to company systems. Without firewalls, hackers are able to break into the systems and steal important data from the company. There are many free of charge firewalls available in the Internet, i.e. Zone Alarm.

Employee education on data security prevents accidents at work and makes the system environment secure and safe. Training and documented data security programme together creates strong basis for employee ICT usage. However, employee education on data security is available for 161 companies in this survey. 69 of those companies are

regularly giving training in this matter. Data security education is mainly given by the larger companies. There is surely need for education in the smaller companies as well (refer to Figure 13).

82 companies have their own documented security programme and 39 of them use and update it regularly. This result shows that standardized data security programmes are neglected in too many companies.

It is important to give employees boundaries for what they are authorized to do at work time and with company IT systems and computers. Own documented data security programme sets the rules for ICT usage and therefore prevents catastrophes to happen.

Table 3   How the companies monitor and evaluate their ICT costs and performance

	Disagree	Neither disagree nor agree	Agree
We regularly monitor and evaluate our IT costs and performance internally	135	60	231
We regularly monitor and evaluate IT costs and performance with selected suppliers and/ or customers	183	71	144
We regularly benchmark IT performance metrics against our competitors	199	69	129

Monitoring IT costs and performance can lead to remarkable savings in costs and make the company function more efficiently with enhanced solutions.

54.2% of the companies answering to this part of the survey monitor and evaluate their IT costs and performance internally. When counted with all 508 respondents of the survey the share is 45.4%.

Almost half (183 from 398) of the respondents to this part of the survey do not monitor or evaluate IT costs or performance with their customers or suppliers.

32.4% of the respondents to this part of the survey regularly benchmark IT performance metrics against their competitors. When considering all 508 respondents, the percentage is a bit over 25%.

These results might mean that in most companies there are not very sophisticated systems in use, and the IT costs are generally low or do not make a difference in overall costs. The amount of micro and small companies affect these results as well. In a one-man-company the monitoring and evaluating is not relevant because the overall IT costs do not necessarily vary very much from month to month or even year to year. In a company of ten persons the volume of business can already

be totally different as well as the amount of IT systems in use. Company's business branch means also a lot; a car repair shop does not have as much IT costs as a high-tech company. Monitoring and evaluating IT costs and performance is still worthwhile because there are as many prices as there are service providers and products available.

3.4 Use of Internet

92.8% of the companies have a broadband connection, while 3.6% of the companies still use a 52Kb modem to get connected to Internet. These modem connections are very expensive and the loss of time is huge comparing to a broadband connection. In addition, using e-mail through a 52Kb modem is very heavy, and services like videoconferencing is directly impossible to use. Another 3.6% of the companies use other type of connections like ISDN or data cards.
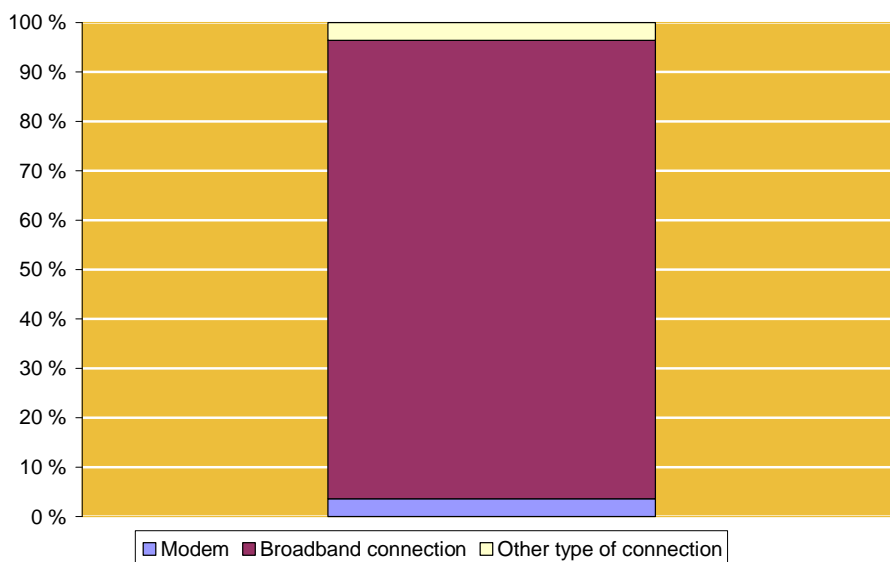
Figure 8   The type of connection companies have to the Internet

75.9% of the companies have their own websites, while 24.1% do not. A research made by the Central Statistical Office of Finland in 2006 reveals that two-thirds of the companies have their own websites. This means that the companies in Southwest Finland are a bit ahead compared to the situation in whole Finland.

In 49.6% of the cases an IT service provider takes care of the companies' websites, while in 50.4% of the cases the companies have their own IT department or a special employee who administers and updates the site.

The cost of buying websites from a service provider can be very high, and the micro and small sized companies might not have the time or resources to seek for information about other cheaper possibilities.

Specialized web hosting services are available for companies that lack the financial or technical resources to operate their own websites.

A web hosting service maintains a large web server or many servers and provides space for company websites against a monthly fee. The firms may create their own websites or a web design firm can do them as well. Some web-based web hosting services give tools to make and update the web pages online.

There are many low-cost web hosting service providers in Finland. Kotisivukone (www.kotisivukone.fi) provides web hosting and tools to build websites for around 20 euros per month. The sites can be made in less than 30 minutes and update any time.

Directa (www.directa.fi) creates the web pages following company preferences. The updating of the website can be done with a phone call to Directa. The service is free of charge for the first six months. After the six months period, there will be a yearly cost of 149 euros + VAT (22%). The money will only be charged if the company is satisfied with the service and the site, and wants to continue with the subscription.

The most common feature included in company websites are general information about the company (96.1% of the cases) and information about offered product/service (94.5% of the cases).

Contact and feedback forms are offered by 66.4% of the companies. Most of the contacting and feedback is done via e-mail or web-based forms. This feature is easy to build, and enhances significantly the level of customer service.

12.8% of the companies offer online job application forms. Online job applications are generally provided by the medium sized and large companies.
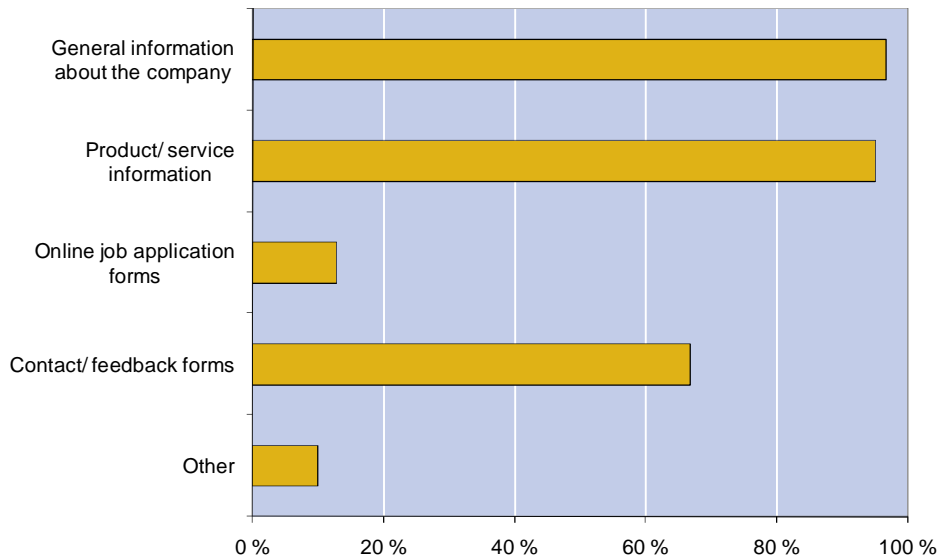
Figure 9   Different type of features that the company web site includes

9.9% of the web sites contain other features like web stores, electronic bulletin boards, manuals, articles, references, directories, timetables, appointment systems, calendars and reservation systems.
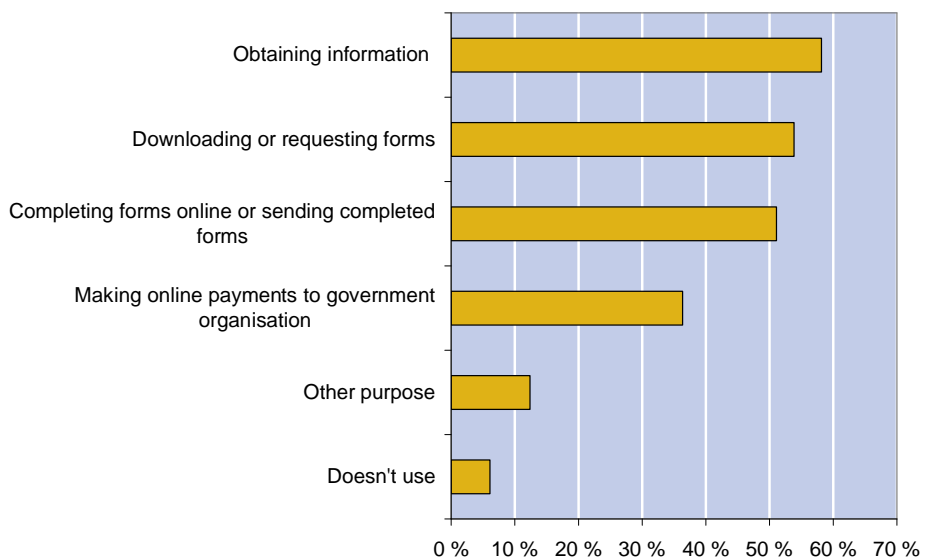
Figure 10   The different purposes companies use the Internet to interact with public authorities and government organisations

Almost 60% of the companies obtain information from public authorities and government organizations through Internet. Companies can find useful information provided i.e. by the tax administration, city departments and government departments.

A bit over half of the companies download or request forms through Internet. There are numerous forms and documents to download or request through Internet i.e. tax related documents and documents for HR use.

Half of the companies complete forms online or send completed forms through Internet to public authorities and government organizations.

Finland's Ministry of Finance provides TYVI–service (tietovirrat yritysten ja viranomaisten välillä) which is set to enhance the electronic information flow between companies and authorities. TYVI provides companies an electronic platform to report/declare information to authorities. The goal is to relieve companies' burden of making the reports and reduce companies' work and costs preparing the reports.

About one third of the companies make online payments to government organizations through Internet. This result is rather odd, because the e-banking systems in Finland are very sophisticated and companies - as well as regular people - are very used to make payments online.

Some 10% of the companies use Internet to find information from public authorities and government organisations. According to the respondents, they use Internet to find information about their business partners, competitors and customers and the financial situation and credit status information of them.

6.7% of the companies do not use Internet to interact with public authorities and government organizations. To the sub question: "Does your company use the Internet for clearing goods through customs?" the companies answered following: 8.7% of the companies use Internet for clearing goods through customs and 91.3% do not.

3.5 E-commerce / E-business

The traditional way of conducting business is to make personal visits to customers and suppliers. 73% of the surveyed companies still visit their customers and suppliers personally.
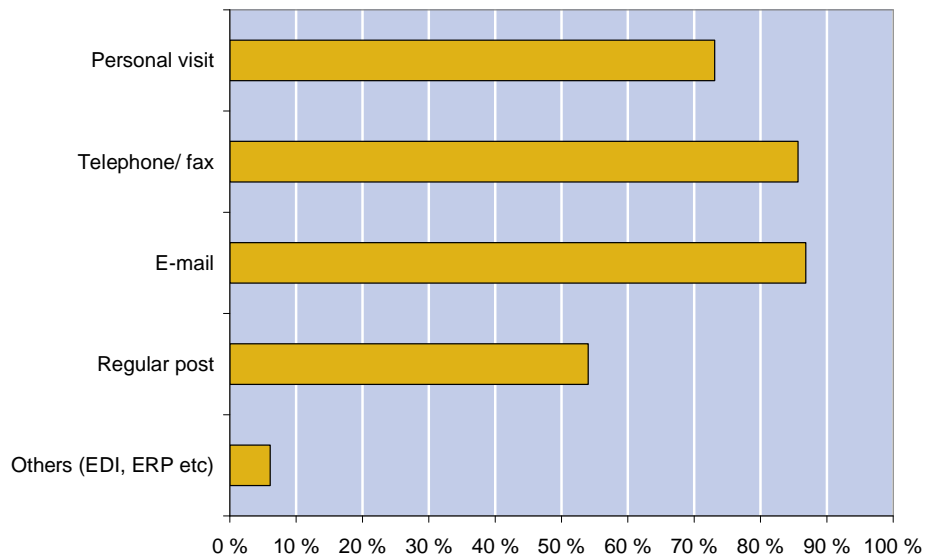
Figure 11   The type of communication methods the organisations use
when communicating with customers and suppliers

85% use telephone and fax to communicate with their customers and suppliers. Telephone is the best media to explain any matter clearly and to get responses immediately. Fax is not as used anymore, because e-mail has replaced it in many tasks. However, fax is still a great media if a company does not have a scanner and must immediately send signed documents to another place of the world. In addition, the fax is not threatened by possible viruses.

E-mail is used by 86% of the companies. It has replaced many of the traditional ways of making business and upgraded the communication between companies to a new level. E-mail is a great media because it is easy to use, post arrives almost in "real time" to the receiver and it can be stored and found over and over again in digital form.

Regular post is not as used as it used to be in the time before e-mail and other electronic means. However, over 50% of the companies in Southwest Finland use regular post to communicate with their customers and suppliers. Presumably communication by regular post means mostly sending important documents that contain delicate information as well as product catalogues, company advertisement and offers.

About seven percent of the surveyed companies use systems like EDI, ERP or extranets to communicate with customers and suppliers. The fact that so many micro and small companies do not have the

resources, the money, or the need to acquire and maintain systems like ERP and extranet, partially explains why the share of companies using these systems is so low.

Table 4   The type of business processes between the companies and their customers / suppliers are handled electronically

	Customers		Suppliers	
	Now	In 3 Years	Now	In 3 Years
Order placement for products/ services	256	313	272	295
Order tracking/ service status available online	138	207	145	209
Payment possibilities	186	276	200	248
After sales support	115	152	89	122

Many business processes can be handled electronically. The amount of systems and applications - like extranets and web-based services - are increasing as technologies become more common.

Order placement for products and services are in many cases made via company extranet or web-based order application. Extranet is the company's own network that is generally secured by a firewall that permits only authorized users like business partners to access. Inside the extranet it is possible to make orders and to check for new products and search for information.

A bit over 50% of the companies provide their customers a possibility to place orders for products and services electronically. In three years the percentage is expected to increase to 60%.

Over 53% of the companies are handling their orders electronically with their suppliers. In three years there should be a slight increase to around 58%.

Order tracking for customers is offered by some 28% of the companies and by some 28% of the company suppliers. In three years the percentages are expected to increase to around 40%. This result is indicating the low amount of logistic companies in the survey.

The companies giving a possibility to check the track of an order or status of a service are mostly manufacturing companies and companies in the logistics branch.

From the surveyed companies, 36% offer electronic payments to their customers and 39% of the companies handle payments with their suppliers electronically. In three years time, these percentages are

going to increase to around 50%. This rather low usage of electronic payments can be caused by the high service fees that the banks take. From the perspective of ease of use and e-banking possibilities in Finland, these results are rather confusing.

Electronic invoices are significant savers in cost and time. It is already possible to send electronic invoices to regular consumers and to companies. According to Tieke (Finnish Information Society Development Centre), large and medium sized companies are widely using electronic invoices. It will take some time to get the smaller companies fully along to the progress. To be able to benefit largely from electronic invoices, the companies need comprehensive accounting and financial applications to backup the new technology. To speed up the development among the smaller companies, electronic invoices need to be introduced and marketed to consumers. Finland is one of the leading countries in electronic banking services.

Electronic after sales support is provided to customers by 22% of the companies. In three years the percentage is expected to increase to around 30%. 17% of the companies are handling after sales support with their suppliers electronically. An easy solution to electronic after sales support is a web page with embedded digital form that can be filled in online and also printed out.

Table 5   The share of companies business that is handled electronically

	0 %	1-19%	20-39%	40-59%	60-79%	80-100%	Total
Customers	67	150	56	40	0	0	313
Suppliers	49	123	53	33	30	73	361

There is not a single company that handles over 60% of the company business transactions electronically with their customers. This result shows that there is not a single pure web-based e-tailing company in this survey.

21.4% of the companies do not make any kind of business electronically with their customers, and 13.6% do not make any business electronically with their suppliers.

48% of the companies handle 1-19% of their business transactions electronically with their customers. The percentage with suppliers is 34%.

17.9% of the companies handle 20-39% of their business transactions electronically with their customers and 14.7% with their suppliers.

12.8% of the companies handle 40-59% of their business transactions electronically with their customers and 9.1% with their suppliers.

8.3% handle 60-79% and 20.2% handle 80-100% of their business transactions electronically with their suppliers.

Nowadays it is very common for the middle sized and large companies like wholesale and manufacturing companies to have extranets or other electronic systems to sell their products. These automated systems take orders from customers, send lists of collections to the warehouse and prepare invoices accounting. Smaller companies may have a web-based service that takes orders and prints them out automatically.

Since it was not included in this survey, it is difficult to know how many of the companies actually have more sophisticated electronic "instruments" to handle business transactions (like electronic order systems and extranets) than e-mail. Due to the fact that most of the responses to this survey are from micro and small sized companies, it is quite obvious that most of the companies use e-mail

Table 6 The companies' opinion on what the development of the share e-commerce will be in their business operations

	Decrease	Remain the same	Increase
Customers	7	170	249
Suppliers	4	159	222

49% of the respondents believe that the share of e-commerce with their customers will increase in the future; 1.4% believes that it will decrease, and 33.5% believe the share will remain the same.

Almost 43.7% believe that the share of e-commerce with their suppliers will increase in the future; 31.3% believe it will remain the same, and around 1% believes the share of e-commerce with suppliers will decrease in the future.
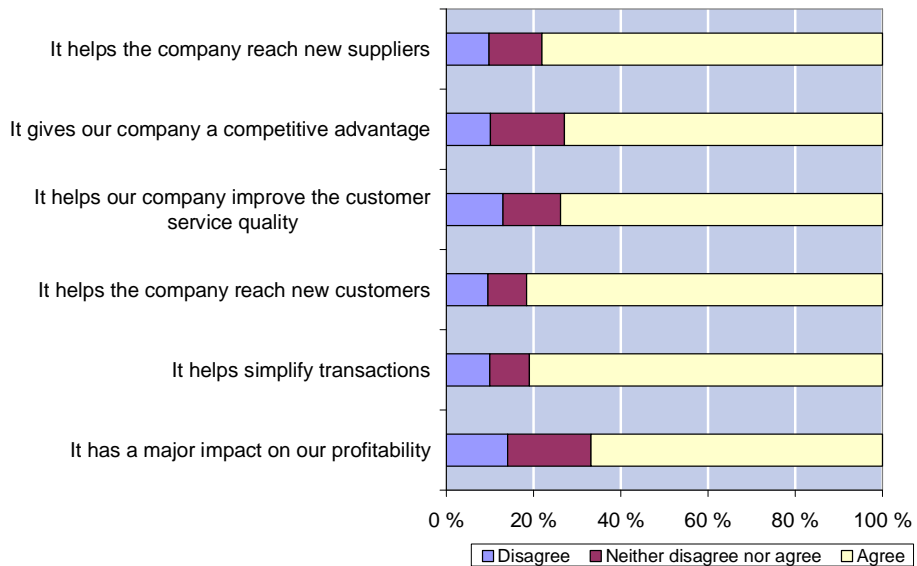
Figure 12   Companies views on the importance of E-commerce to their own company

There are various ways companies can benefit from using ICT in everyday business. ICT can be used i.e. to streamline and simplify business transactions and to reach new customers and suppliers. The majority of the companies agree that e-commerce is important and have an effect on their business. This reflects a relatively high knowledge of e-commerce in common.

There is a great potential to expand the search of new suppliers effectively, fast and cheap by Internet and e-mail. Being available in search engines enables other firms to find you more effectively.

73.8% of the respondents believe that e-commerce helps their company to reach new suppliers; 8.9% of them believe that using e-commerce will not help them reach new suppliers at all, and 17.3% of the companies neither disagree nor agree on this issue.

By making something better or another way than the competitors, a company can achieve competitive advantage. Competitive advantage can be achieved in many different ways with e-commerce. 69.5% of the respondents believe that ICT gives competitive advantage to their company; 9.6% of the companies disagree that they get competitive advantage with e-commerce and 20.9% neither disagree nor agree.

A big majority - 71.1% of the respondents - believes that e-commerce improves their customer service; 12.2% disagree and 16.6 neither agree nor disagree on this issue.

The service quality is a double-edged sword, either you handle it well or you do not. When a business transaction is handled well, the customers will come back and buy more, and if it is handled badly the customers are not coming back unless they do not have another choice.

Customer service can be easy if the resources are adequate and the people taking care of this service, well organized. Frequently asked questions (FAQ) on the web pages on such things that people mostly have questions. Customer service through e-mail can be efficient and the response rate high, because the received mails stay in the mailbox and thus cannot be ignored as easily as other contact methods. Compared to phone-based customer service where a customer might have to wait on the phone for a longer time, the e-mail is answered "on time".

E-commerce can be very effective and budget-efficient in finding new customers. Being available on the Internet and search machines helps customers find the products and services they are looking for. 78.6% of the respondents believe that e-commerce helps the company to reach new customers. 12.8% of the companies do not believe that e-commerce will help them reach new customers and 8.6% neither agrees nor disagrees.

Electronic transactions between and within companies can simplify and speed up operations and transactions. Approximately 77% of the respondents believe that e-commerce simplifies their business transactions; 10.8% disagree, and 12.2% neither disagree nor agree on this issue.

63.5% of the respondents believe that e-commerce has a major impact to their profitability, 13.3% of the respondents disagree, and 23.3% neither disagree nor agree on the statement.

Many companies agree that e-commerce has a major impact on their profitability. Selling and marketing company products and services through electronic means can be a very profitable extension to the traditional selling activities like customer visits and telephone calls. When e-commerce is well handled and the company strategy stands behind it, it is assumable that e-commerce brings profit to the company.

3.6 General assessment of ICT usage

In this section, the companies were asked about different kind of barriers for the present or future use of Internet, E-commerce and ICT in general. The respondents were supposed to give an opinion on the issues by selecting between -2 and +2 (where: -2 = very negative, -1 = negative, o = does not know, +1 = positive, +2 = very positive; NR = no response).
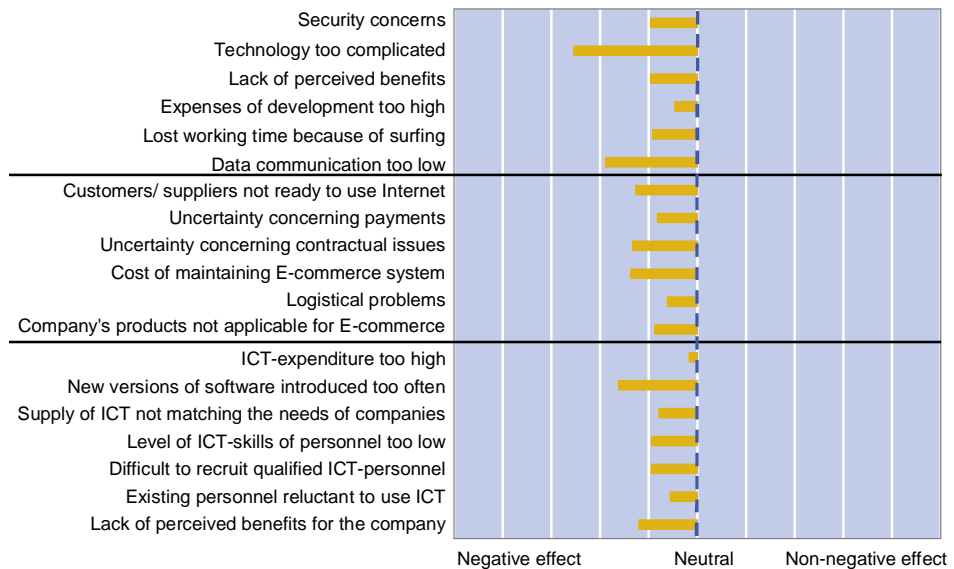
Figure 13   The effect of different barriers on the use of Internet, e-commerce and ICT in general

3.6.1 Barriers on use of Internet

Security concerns on the use of Internet seem to represent a major barrier for the companies in Southwest Finland. Malicious software programmes include a variety of threats; spywares, viruses, worms and Trojan horses etc. Viruses are set to destroy data, use the computer for illegal actions, format the hard drive or make the computer programmes run improperly. Viruses typically spread from one user to another i.e. via e-mail attachments. To hinder the possibility of getting viruses or hackers to the computers, the companies should have antivirus software and firewalls installed to protect the data security.

Some of the companies are clearly neglecting the security concerns because they do not have these applications running in their systems (Refer to Table 2).

One of the respondents revealed that they do not open any e-mail attachment because they worry about viruses. It is true that e-mail attachments can contain malicious software but this kind of doubtfulness can only stem from ignorance. Giving information about the viruses and what kind of attachments are dangerous and should not be opened, would help some of the companies a lot. They might even lose some valuable orders because of the lack of knowledge. Most of the e-mails containing attachments are not threats to the companies. Trusted senders should be put to lists on the e-mail programme.

The majority of the respondents consider technology too complicated. Because most of the companies participating in this survey are micro and small companies from all kinds of branches, it is obvious that all of them can not master technology perfectly. The courage to start using something you do not have a good knowledge is difficult for most of us, especially for the elderly generations. Lack of training and knowledge leads to frustration, lack of interest and sometimes to common resistance towards new technologies. This matter can be conquered by offering suitable training for the employees.

One third of the respondents consider the lack of perceived benefits on the use of Internet as a negative issue. There are many negative and positive issues in using Internet in the companies. The most negative issue is clearly the unnecessary surfing by employees. Positive issues and benefits for the companies are the possibilities to use e-banking systems, search for information about existing and new business partners etc.

191 respondents out of 472 consider the development and maintenance expenses of a website too high. 126 of these companies have between 1 and 9 employees, and can therefore be classified as micro sized companies. Roughly 50 of the 191 companies can be classified as small sized companies and around 15 as middle sized or large companies.

Micro and small sized companies seldom need very sophisticated websites with state-of-the-art technologies. Developing a website for a micro or small company can be very economical in contrast to larger companies, because the needs and scales are totally different. There

are a lot of low-cost website service providers on the web for Finnish companies. The monthly costs vary between 15 and 20 euros/month.

The large amount of respondents believing websites are expensive to build and maintain reveals that there is a lack of knowledge about the service providers, markets and prices of website development and maintenance.

Employees surfing in the Internet during working hours seem to be a rather worrying issue for companies. Most of the companies see irrelevant surfing during working hours as problematic.

A solution to avoid surfing during working hours could be an application which restricts users surfing through irrelevant websites. The software is possible to install in any computer and it does not cost a lot. For example Codewise Oy's Block Office licenses cost 11.95 euros upwards.

Some 35% of the respondents consider low or unstable data communication as a challenge for the company. Unstable or too low data communication can make remarkable harm to the companies' business transactions. It is especially harmful for those companies that have web stores, extranets or provide e-ordering systems to their customers.

3.6.2   Barriers on use of e-commerce

Around 40% of the respondents consider that customers and/or suppliers are reluctant to use e-commerce.

E-commerce solutions like extranets are a secure and safe way to handle business transactions between companies. Any company that operates as a supplier or customer can benefit from extranets, although it can be costly for a small company to build and maintain one.

Over 40% of the respondents consider uncertainty and security problems concerning payments as a barrier for the company. In Finland very sophisticated and reliable web banking services exist. Recently there have been some phasing attempts, but mainly they have not been successful. Using credit cards for company payments in the Internet is always risky if the receiver is unknown.

A big majority consider uncertainty with contracts, terms of delivery and guarantees problematic for the use of e-commerce. Buying and importing products from foreign countries has become easier with e-commerce. Domestic e-commerce is more reliable and the company

information can be easily checked. However, contract terms should still be read before ordering to prevent any harm.

The cost for developing and maintaining an e-commerce system represents a barrier for many companies. Around 40% of the companies consider developing and maintaining an e-commerce system very expensive. In contrast, roughly 25% consider developing and maintaining is not too expensive.

There are different kinds of e-commerce systems and the price is directly related to the size and scope the system is built, and by whom. Some of the most known and used service providers for e-commerce systems in Finland are Tradedoubler and Planeetta Internet.

The Finnish Entrepreneurs in cooperation with Sampo, Elisa, Soprano and Tekes are speeding up e-commerce in Finland. Their goal is to build 50,000 new web stores in the next two years in Finland. The tree companies; Sampo, Elisa and Soprano will deliver the platform free of charge in the beginning. Tekes - the Finnish Funding Agency for Technology and Innovation - is the main public financing and expert organisation for research and technological development in Finland (Suomen kuvalehti).

Logistical problems are not seen as very problematic in the use of e-commerce. Close to 30% of the respondents consider it problematic.

Most of the products and services meant to consumers are applicable to Internet sales. Even the bigger ones like cars and houses can be put on sale through Internet, but mainly with marketing intentions. A little over 35% of the respondents see it problematic if their products are not applicable for Internet sales.

3.6.3 Barriers on use of ICT in general

Many companies consider ICT expenditure as a major barrier for the use of ICT in general. This result is understandable from the perspective of micro companies. ICT can be very expensive especially if it is not known what is really wanted and needed. Usually there are many alternatives for the same or similar kind of products and services. The prices may vary from each other like with computer hardware or website service providers, even if the products and services are similar.

Most of the respondents consider that new versions of existing software are appearing too often on the market. Some companies have to buy new versions every time one comes out on the market. These companies are normally high-tech companies or use

applications that are vital to their business. Basic programmes like Word, Excel, etc., do not change that often. In addition, most of the users utilize only a small portion of the potential these programmes can provide.

Some 40% of the companies say that the existing ICT technology not matching the ICT needs of the company is a barrier for their ICT usage. When looking at the company profiles, it seems like this result is based on a lack of knowledge. Finding right technologies, systems and applications for company needs can be hard without any knowledge of software producers and their products. However, most of the software producers and their products are easy to find from the Internet with some keywords in a search machine.

Programmes that a company needs and do not exist, can be done. Small programmes do not cost much; more sophisticated programmes cost a little bit more. For the transactions in any micro or small company there should be a programme that can be used in any area of business in any branch.

Low level of ICT skills among the employees is considered as a barrier in general ICT usage in many companies in Southwest Finland. Training considering ICT is necessary for everybody. One of the key issues for companies is to keep up with the technology and taking advantage of it.

Many of the respondents consider recruiting qualified ICT personnel as a barrier in general ICT usage. This is a problem especially for the smaller companies that can not compete with the resources and interesting job offers given by larger companies. Consulting firms and other ICT service providers are relatively expensive to use whether the need is for long or short term.

Reluctance to use ICT is a barrier for almost 40% of the respondents. Using ICT can be hard to any employee, especially without comprehensive training. Motivating employees to use ICT through knowledge and training will ease the use of ICT.

One third of the companies consider the lack of perceived benefits as a barrier to ICT usage. Perceived benefits are sometimes hard to find and measure, especially in the short term. In many cases customers must be taught to use new products and services to make them long term customers. To get benefits from new systems and technologies, the customers and business partners must be taught to use them over and over again. It will take time, and perceived benefits for the company will come forth in long term perspective.

Possible long term benefits from e-commerce are i.e. increased sales, increased organizational flexibility, more timely information, more information, increased organizational learning, improved decision-making, improved operations, improved organizational planning, lower operational costs, lower computer expenses, increased productivity, higher client satisfaction, improved resource control, and better corporate image.

4   SUMMARY AND CONCLUSIONS

The survey received 508 responses throughout Southwest Finland. 466 of the responses came from micro and small sized companies which reflect many of the results in the survey. The respondents were divided into four different categories according to their branch; Manufacturing (127), Trading (56), Logistic service providers (35) and "Others" (290). Most of the responses were given by people of the Senior Management (346) and Middle Management (50).

The level of ICT implementation in different business areas is not extremely high in Southwest Finland. Applications are mostly used to support areas such as Accountancy, Finance and Marketing & Sales. The lack of perceived benefits is seen as a barrier for further usage of ICT. A big number of the respondents consider general ICT expenditures too high, although many of them spend less than 2.5% of their annual turnover for IT costs (IT personnel, hardware and software). Most of the companies expect that the costs remain the same in the near future. One quarter of the companies are benchmarking their competitors regularly and almost half regularly monitor and evaluate their own IT costs and performance.

The results of the study also show that especially in micro and small companies the level of know-how in ICT is relatively low. On the other hand, the level of know-how is considered rather high within larger companies. The lack of knowledge and practical training in computer-related issues indicates that adequate education is needed especially within the smaller companies.

There is a very high broadband penetration within the companies in Southwest Finland; over 90% of the companies have broadband connections; around 4% use IDSN or data cards and another 4% is still using modems. These results indicate that the broadband infrastructure and its benefits are widely recognized among the companies. The regular 52Kb modem connection is unreliable, costly, very slow and not compatible compared with other types of connections. Internet and e-mail is provided to most of the employees. The companies use Internet to find information about their business partners, competitors and customers and also the financial situation and credit status information of them.

Over 75% of the companies in Southwest Finland have their own websites. Compared to the country's average, the percentage is roughly 10 points higher than the average. Despite of the high percentage, especially micro sized companies consider that websites are expensive to develop and maintain. However, there are service providers that build and maintain websites for as cheap as 15 euros/month. Websites can be considered as cheap marketing, especially for micro and small sized companies. To find different kind of solutions it is necessary to know how to search for information on the Internet.

The utilization of electronic services provided by local authorities and government is moderate. Around 50% of the companies obtain information, download and complete forms online. Online payments to government organisations are performed by some 35% of the companies. The percentage is rather low considering the possibilities and general level of e-banking existing in Finland.

The Internet is more vulnerable than internal networks because it is open to anyone. When the Internet becomes part of the company's network, the information systems are in danger to actions from outside.

To hinder the possibility to get viruses or hackers to their computers, the companies should use antivirus software and firewalls for protection. Some of the companies are clearly neglecting the security concerns because they do not have these applications running in their systems. In contrast, some of the companies do not even open attachments because they are too afraid they could contain viruses and spywares. Those companies can be losing significant amounts of offers and orders just because they lack knowledge in the matter. This is clearly the wrong type of data security. The Yritys ICT programme provided by ICT Turku is clearly needed among many companies.

Generally, the meaning of e-commerce is recognized by the companies. Electronic commerce is growing; within the next three years it is expected to grow around 10%. Companies are using more and more electronic means to handle everyday business transactions.

Many applications are too hard and heavy to handle for a small company. Many of these sophisticated applications can be quite expensive for companies with one or few employees.

The biggest problem found in this survey seems to be the lack of general know-how with computer related issues. To further help the companies there should be an advising portal in the Internet for company use. Yritys ICT is a good example of a job well done.

5   REFERENCES

Central Statistical Office of Finland
www.stat.fi

Finnish Information Society Development Centre
www.tieke.fi/tyvi

Suomen kuvalehti
www.suomenkuvalehti.fi

APPENDIX

Appendix 1 Interview guideline

Module A   Contact- and background information

1. Contact information

a) Company Name/Business Unit: [Open field]

b) Postal Code: [Open field]

c) Contact e-mail: [Open field]

(Provide this information if you wish to receive the customised survey report)

d) Respondent's position in the company [Drop-down menu]

[ ]   Senior management   [ ]   Expert

[ ]   Middle management   [ ]   Other

[ ]   Operational staff

e) Please choose whether you wish to respond on behalf of the whole firm or a group of companies OR an individual business unit [Drop-down menu]

[ ]   I wish to respond on behalf of the whole firm or a group of companies

[ ]   I wish to respond on behalf of an individual business unit.

2. Please indicate the current number of employed people: [Drop-down menu]

[ ]   1 -9   [ ]   1000 – 1999

[ ]   10 – 49   [ ]   2000 – 4999

[ ]   50 – 249   [ ]   5000 – 10000

[ ]   250 – 499   [ ]   Over 10000

[ ]   500 – 999

In the next 3 years, do you expect the number of employees to … [Drop-down menu]

[ ]   decrease   [ ]   increase

[ ]   remain constant

3. What activity best classifies your company? [Drop-down menu]

[ ]   Automotive industry

[ ]   Manufacturing of textiles and textile products

[ ]   Financing / Banking / Insurance

[ ]   Publishing and printing

[ ]   Manufacturing of electrical and optical equipment
[ ]   Manufacturing of basic metals and fabricated metal products
[ ]   Manufacturing of pulp, paper and paper products
[ ]   Manufacturing of wood and wood products
[ ]   Manufacturing of chemicals, chemical products, and man-made fibres
[ ]   Manufacturing of food products and tobacco
[ ]   Wholesale Trade
[ ]   Retail Trade
[ ]   Government, Public Administration
[ ]   Energy Supply
[ ]   Construction
[ ]   Transport, Distribution and Logistics
[ ]   Health and Human Services
[ ]   Tourism and Leisure Industry
[ ]   ICT / Telecommunication
[ ]   Maritime Industry
[ ]   Other

4. Please indicate the total turnover of your company in the past year

[Drop-down menu]

[ ]	0 – 2 M EUR	[ ]	50.1 – 100 M EUR
[ ]	2.1 – 5 M EUR	[ ]	100.1 – 500 M EUR
[ ]	5.1 – 10 M EUR	[ ]	500.1 – 1000 M EUR
[ ]	10.1 – 25 M EUR	[ ]	1.1 – 5 billion EUR
[ ]	25.1 – 50 M EUR	[ ]	over 5 billion EUR

How do you expect the company's turnover to develop in the next 3 years?

[Drop-down menu]

[ ]   decrease   [ ]   increase
[ ]   remain constant

5. Does the company have other subsidiaries? [Separate tick box for each]

[ ]   Yes, but only in (the home country)
[ ]   Yes, also abroad: In the Baltic Sea Region[1]   [ ]
                                 Rest of Europe   [ ]
                                 Other   [ ]
[ ]   No

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[1] South-West Finland, Östergötland, Denmark, Hamburg, West-Mecklenburg, North-East Poland, Lithuania, Latvia, Estonia, St. Petersburg

Module B   Use of ICT systems

6. What percentage of your employees has access to...? [Separate tick box for each]

	0%	< 25%	25-50%	51-75%	> 75%
Company E-mail account	[ ]	[ ]	[ ]	[ ]	[ ]
Internet	[ ]	[ ]	[ ]	[ ]	[ ]

a. If any option was answered with '0%':

Does the company plan to give access to company E-mail account/Internet to the employees in the future? [Drop-down menu]

[ ]   Yes

[ ]   No

7. Does the company use (or plan to use) ICT technology in following areas?

[Separate tick box for each]

	Use	Plan to use	Not use
Accountancy	[ ]	[ ]	[ ]
Marketing/Sales	[ ]	[ ]	[ ]
Production	[ ]	[ ]	[ ]
Production Planning	[ ]	[ ]	[ ]
Logistics/Stock keeping	[ ]	[ ]	[ ]
Sourcing/Supply	[ ]	[ ]	[ ]
Finance	[ ]	[ ]	[ ]
Human Resources	[ ]	[ ]	[ ]
Other: _____	[ ]	[ ]	[ ]

8. The company has ... (check both options if they apply to your company)

[Separate tick box for each]

[ ]   an own IT department. With approximately _____ employees.

[ ]   an IT service provider (IT outsourcing)

[ ]   none of the above mentioned

How do you expect the outsourcing of IT services in your company to develop in the next three years? [Drop-down menu]

[ ]   decrease

[ ]   remain constant

[ ]   increase

9. Please estimate the following ICT expenses expressed as % of company turnover in the past year. [Drop-down menu]

	0%	02-5%	2,5-5%	5-7,5%	7,5-10%	> 10%
Hardware	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Software	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
IT Personnel	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

b. How do you expect these expenses to develop in the next 3 years?

[Separate tick box for each]

	decrease	remain constant	increase
Hardware	[ ]	[ ]	[ ]
Software	[ ]	[ ]	[ ]
IT Personnel	[ ]	[ ]	[ ]

10. Does your company have – and actively use/update – the following data security measures? [Drop-down menu]

	available	regularly used/updated
Password access control	[ ]	[ ]
Virus protection applications	[ ]	[ ]
Computer firewall applications	[ ]	[ ]
Employee education on data security	[ ]	[ ]
Own documented data security program	[ ]	[ ]

11. Please indicate the extent to which you agree or disagree with the following statements regarding "IT performance evaluation" from the perspective of your company (where: -2 = strongly disagree, -1 = disagree, 0 = neither disagree nor agree, +1 = agree, +2 = strongly agree, NR = no response)

	- 2	- 1	0	+ 1	+ 2
We regularly monitor and evaluate our IT costs and performance internally	[ ]	[ ]	[ ]	[ ]	[ ]
We regularly monitor and evaluate IT costs and performance with selected suppliers and/or customers	[ ]	[ ]	[ ]	[ ]	[ ]
We regularly benchmark IT performance metrics against our competitors	[ ]	[ ]	[ ]	[ ]	[ ]

Module C   Use of Internet

12. What type of connection to the Internet does your company use? [Drop-down menu]

[ ]   Modem (via standard phone line)

[ ]   Broadband connection

[ ]   Other type of connection: _____

13. Does your company have a website. [Drop-down menu]

[ ]   Yes

[ ]   No *(Go to question 16)*

14. About the company's website...

a) Who designed and administers the website? [Separate tick box for each]

[ ]   an IT service provider

[ ]   the company's own IT department/special employees

b) Which of the following features does the website include? (Please check all that apply)
[Separate tick box for each]

[ ]   general information about the company

[ ]   product/service information

[ ]   online job application forms

[ ]   contact/feedback forms

[ ]   others: _____

15. Does your company use the Internet for interacting on a regular basis with public authorities/government organisations (Ministries, local governmental departments, Customs, etc)? [Separate tick box for each]

[ ]   Yes, the company interacts with public authorities/government organisations for...

[ ]   obtaining information (i.e. from websites or via e-mail)

[ ]   downloading or requesting forms

[ ]   completing forms online or sending completed forms

[ ]   making online payments to government organisations

[ ]   other (please specify) _____

[ ]   No

16. Does your company use the Internet for clearing goods through Customs?

[ ]   Yes

[ ]   No

Module D   E-commerce/E-business

17. Which of the following methods does your company use on a regular basis to contact customers/suppliers? [Separate tick box for each]

[ ]   personal visit

[ ]   telephone/fax

[ ]   e-mail

[ ]   regular post

[ ]   Others (EDI, ERP, etc):_____

18. Which of the following business processes between your company and your customer/supplier are handled electronically (i.e. Internet, EDI, ERP)?
[Separate tick box for each]

	Customers	Suppliers
- order placement for products/services	[ ]	[ ]

	Customers	Suppliers
- order tracking / service status available online	[ ]	[ ]
- payment possibilities	[ ]	[ ]
- after-sales support	[ ]	[ ]

How do you think the situation would look like in 3 years?

	Customers	Suppliers
- order placement for products/services	[ ]	[ ]
- order tracking / service status available online	[ ]	[ ]
- payment possibilities	[ ]	[ ]
- after sales support	[ ]	[ ]

19. Please indicate the approximate percentage of the company's commerce/business handled electronically (i.e. Internet, EDI, ERP) during the past year:

[Separate tick box for each]

	Customers	Suppliers
0%	[ ]	[ ]
1 – 9%	[ ]	[ ]
10 – 19%	[ ]	[ ]
20 – 29%	[ ]	[ ]
30 – 39%	[ ]	[ ]
40 – 49%	[ ]	[ ]
50 – 59%	[ ]	[ ]
60 - 69%	[ ]	[ ]
70 - 79%	[ ]	[ ]
80 - 89%	[ ]	[ ]
90 - 100%	[ ]	[ ]
doesn't know	[ ]	[ ]

In the next 3 years, do you expect this percentage to …

decrease	[ ]	[ ]
remain constant	[ ]	[ ]
increase	[ ]	[ ]

20. Please indicate the extent to which you agree or disagree with the following statements regarding the "importance of E-commerce/E-business" from the perspective of your company (5-point scale, where -2 = strongly disagree, -1 = disagree, 0 = neither disagree nor agree, +1 = agree, + 2 = strongly agree, NR = no response) [Separate tick box for each]

	- 2	- 1	0	+ 1	+ 2	NR
It has a major impact on our profitability	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
It helps simplify transactions	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

It helps the company reach new customers [ ] [ ] [ ] [ ] [ ] [ ]

It helps our company improve
the customer service quality [ ] [ ] [ ] [ ] [ ] [ ]

It gives our company a competitive advantage [ ] [ ] [ ] [ ] [ ] [ ]

It helps the company reach new suppliers [ ] [ ] [ ] [ ] [ ] [ ]

Module E   General assessment of ICT usage

21. Please assess the significance of following barriers for the present or future use of Internet, E-commerce and ICT in general in your company. Indicate your opinion on the effect of each issue in your company by selecting between – 2 – + 2 (where: -2 = very negative, -1 = negative, 0 = doesn't know, +1 = positive, +2 = very positive, NR = no response). [Separate tick box for each]

	- 2	- 1	0	+ 1	+ 2	NR
Barriers on use of Internet						
Security concerns (i.e. hacking, viruses)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Technology is too complicated	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lack of perceived benefits for the company	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Expenses of development and maintenance of website are too high	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Lost working time because of irrelevant surfing	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Data communication is too low or unstable	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Barriers on use of E-commerce						
Customers/suppliers not ready to use Internet Commerce	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Uncertainty/security problems concerning payments	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Uncertainty concerning contracts, terms of delivery and guarantees	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cost of developing and maintaining an E-commerce system	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Logistical problems	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Company's products/services not applicable for Internet sales	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Barriers on use of ICT in general						
ICT expenditure too high	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
New versions of existing software are introduced too often	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Supply of ICT technology not matching
the ICT needs of the companies   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]
The level of ICT skills is too low among
the employed personnel   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]
Difficult to recruit qualified ICT personnel   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]
Existing personnel reluctant to use ICT   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]
Lack of perceived benefits for the company   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]

(where: -2 = strongly disagree, -1 = disagree, 0 = neither disagree nor agree, +1 = agree, +2
= strongly agree, NR = no response)

	- 2	- 1	0	+ 1	+ 2	NR

Regional e-Government activities

I'm satisfied with the existing
e-Government offers   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]
I'd appreciate more and better
e-Government offers   [ ]   [ ]   [ ]   [ ]   [ ]   [ ]

Module F   Reaaliaikaisesta seurannasta

22. Näettekö tarpeelliseksi seurata tavaravirtaa reaaliajassa?

[ ]   Kyllä
[ ]   Ei

23. Onko teillä jo käytössä seurantaan soveltuva järjestelmä?

[ ]   Kyllä
[ ]   Ei

24. Aiotteko tulevaisuudessa hankkia sellaisen?

[ ]   Kyllä
[ ]   Ei

25. Millainen järjestelmä teillä on käytössä, tai aiotte tulevaisuudessa hankkia?

[ ]   Teollisuudelle suunnitellut mobiilit päätelaitteet
[ ]   RFID-sovellukset
[ ]   Puhelinsovellukset
[ ]   Muut, mitkä? _____

LogOn Baltic Publications (as of 21.9.2007)

LogOn Baltic Master reports

1:2007   Developing Regions through Spatial Planning and Logistics & ICT competence - Final report
Wolfgang Kersten, Mareike Böger, Meike Schröder and Carolin Singer

2:2007   Analytical Framework for the LogOn Baltic Project
Eric Kron, Gunnar Prause and Anatoli Beifert

3:2007   Aggregated logistics survey report *(working title)*
Håkan Aronsson and Naveen Kumar

4:2007   Aggregated ICT survey report *(working title)*
Eric Kron and Gunnar Prause

5:2007   Aggregated Expert interview report *(working title)*
Matti Takalokastari

LogOn Baltic Regional reports

Development Measure Impact Analysis (DEMIA)

10:2007   REGIONAL DEVELOPMENT IN THE SOUTHERN METROPOLITAN REGION OF HAMBURG, GERMANY - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Janina Benecke, Jürgen Glaser and Rupert Seuthe

11:2007   REGIONAL DEVELOPMENT IN MECKLENBURG-VORPOMMERN, GERMANY - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Gertraud Klinkenberg

12:2007   REGIONAL DEVELOPMENT IN ESTONIA - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Jaak Kliimask

13:2007   REGIONAL DEVELOPMENT IN SOUTHWEST FINLAND - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Kaisa Alapartanen

14:2007   REGIONAL DEVELOPMENT IN LATVIA - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Riga City Council - Rode & Weiland Ltd.

15:2007   REGIONAL DEVELOPMENT IN LITHUANIA - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
NN

16:2007   REGIONAL DEVELOPMENT IN POMERANIA, POLAND (THE POMORSKIE VOIVODESHIP) - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Anna Trzuskawska

17:2007   REGIONAL DEVELOPMENT IN SAINT PETERSBURG, RUSSIA - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Mikhail Pimonenko

18:2007   REGIONAL DEVELOPMENT IN ÖSTERGÖTLAND, SWEDEN - Development Measure Impact Analysis (DEMIA) on regional development related to logistics and ICT
Håkan Aronsson and Staffan Eklind

ICT surveys

20:2007   ICT SURVEY IN THE SOUTHERN METROPOLITAN REGION OF HAMBURG, GERMANY
Wolfgang Kersten, Meike Schröder, Mareike Böger, Carolin Singer and Tomi Solakivi

21:2007   ICT SURVEY IN MECKLENBURG-VORPOMMERN, GERMANY
Eric Kron, Gunnar Prause and Tomi Solakivi

22:2007   ICT SURVEY IN ESTONIA
Seren Eilmann and Tomi Solakivi

23:2007   ICT SURVEY IN LATVIA
Riga City Council, Telematics and Logistics Institute Ltd. and Tomi Solakivi

24:2007   ICT SURVEY IN LITHUANIA
NN and Tomi Solakivi

25:2007   ICT SURVEY IN SOUTHWEST FINLAND
Juha Läikkö and Tomi Solakivi

26:2007   ICT SURVEY IN POLAND
Anna Trzuskawska and Tomi Solakivi

27:2007   ICT SURVEY IN SAINT PETERSBURG, RUSSIA
Yuri Ardatov and Tomi Solakivi

28:2007   ICT SURVEY IN ÖSTERGOTLAND, SWEDEN
Naveen Kumar, Håkan Aronsson and Tomi Solakivi

Logistics surveys

30:2007   LOGISTICS SURVEY IN THE SOUTHERN METROPOLITAN REGION OF HAMBURG, GERMANY
Wolfgang Kersten, Mareike Böger, Meike Schröder, Carolin Singer and Tomi Solakivi

31:2007   LOGISTICS SURVEY IN MECKLENBURG-VORPOMMERN, GERMANY
Eric Kron, Gunnar Prause and Tomi Solakivi

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Valeri Lukinsky, Natalia Pletneva and Tomi Solakivi

38:2007   LOGISTICS SURVEY IN ÖSTERGÖTLAND, SWEDEN
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Expert interviews

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Wolfgang Kersten, Meike Schröder, Carolin Singer and Mareike Böger

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46:2007   EXPERT INTERVIEWS IN POMERANIA, POLAND - Results and analysis of the intersectoral expert interviews in the field of logistics and ICT
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47:2007   EXPERT INTERVIEWS IN SAINT PETERSBURG, RUSSIA - Results and analysis of the intersectoral expert interviews in the field of logistics and ICT Russia
Natalia Ivanova

48:2007 EXPERT INTERVIEWS IN ÖSTERGÖTLAND, SWEDEN - Results and analysis of the intersectoral expert interviews in the field of logistics and ICT
Håkan Aronsson, Staffan Eklind and Naveen Kumar

Regional Profiles

50:2007 REGIONAL LOGISTICS & ICT PROFILE: THE SOUTHERN METROPOLITAN REGION OF HAMBURG, GERMANY
Wolfgang Kersten, Meike Schröder, Mareike Böger and Carolin Singer

51:2007 REGIONAL LOGISTICS & ICT PROFILE: MECKLENBURG-VORPOMMERN, GERMANY
Eric Kron, Gunnar Prause and Gertraud Klinkenberg

52:2007 REGIONAL LOGISTICS & ICT PROFILE: ESTONIA
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LogOn Baltic Master reports

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Kent Bentzen and Michael Stie Laugesen

LogOn Baltic Regional reports

70(FI):2007 VARSINAIS-SUOMEN LOGISTINEN KILPAILUKYKY
Matti Takalokastari (toim.)

71:2007 AIR TRAFFIC SERVICE DEVELOPMENT IN TURKU REGION _(working title)_
Pekka Jaakkola

72:2007 ENTERPRISE ICT _(working title)_
Kalle Luhtinen

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