

ICT Competence and Regional Development

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A regional study

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Wismar University is taking part in several European projects with focus on the Baltic Sea Region (BSR). LogOn Baltic is an INTERREG III B – project aiming to investigate the impact of Information and Communication Technologies (ICT) and logistics competence on regional development. The extent to which enterprises around the BSR have adopted and made use of ICT has been analyzed with help of several empiric activities within the framework of the LogOn Baltic Project. By using the results of an ICT Survey, Expert Interviews, and secondary data collection, the first conclusions can be stated.

Since reunification in 1990, the regional government of Mecklenburg-Vorpommern has been trying to improve the regional infrastructure by a variety of investments in state-of-the-art technologies. A modern digital telephone and data network was established, a modern fiber optic system, and a new internet backbone have been constructed in order to transform Mecklenburg-Vorpommern into an interesting location for future and technology-oriented companies. Mecklenburg-Vorpommern used to belong to the former German Democratic Republic.

Not all expectations from the beginning have been realised, revealing that the hardware part is representing only one main success factor for economic development in the ICT sector. The regional ICT competence turned out to be even more important as a main location factor when it comes to innovation, networking and cluster building in regions.

This paper aims at reflecting the results of the LogOn Baltic related studies, concentrating on the situation in Mecklenburg-Vorpommern in the context of the Baltic Sea Region.

Introduction

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 [LB1].

The purpose of LogOn Baltic is to present solutions to improve the interplay between logistics & ICT competence and spatial planning and strengthening Small and Medium-sized Enterprises (SME's) 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
- Denmark
- Hamburg
- West-Mecklenburg
- North-East Poland
- Lithuania
- Latvia
- Estonia
- St. Petersburg

LogOn Baltic provides an overview of logistics efficiency and logistics information systems and their exploitation, in order to improve the interaction between SME's 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, Logistics survey, ICT survey, Development Measures Impact Analysis (DEMIA) and Expert Interviews; each of these is presented in a separate report. These results, together with secondary data, are 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 inter-regional comparison which is reported in an inter-regional report. All reports will be available on the project homepage www.logonbaltic.info.

General situation of the ICT in Mecklenburg-Vorpommern

Mecklenburg-Vorpommern is an ideal location for a future-oriented industry with perspectives in the German, Northern European and Eastern European market. The region is equipped with one of the most modern digital telephone and data networks of Europe. The completely digitized communications network with recent fibre glass technology is only a few years old. The most innovative net of Europe is online and available for communication with other partners.

In Mecklenburg-Vorpommern the information and communication technology developed positively. Currently there are about 600 ICT-enterprises with approximately 14,000 employees, with approximately 9,000 in the service and around 5,000 in the telecommunications. Further are approximately 1,000 co-workers at universities and institutions busy in ICT. The different projects within the ICT range are bundled and coordinated by the IT-Initiative Mecklenburg-Vorpommern since 2005 [LB2].

The 10th of December 1997 marked the dawning of the digital age in Mecklenburg-Vorpommern. For EUR 3.25 billion, a closely-meshed network of more than 4,500 km of optic fiber cable was created. This network is one of the most modern of its kind in the world and promises to satisfy even the most demanding communication needs for years to come. All points of junction were completed using state-of-the-art technology. A network of this quality is able to support the communication of a virtually unlimited amount of data.

Our telecommunications infrastructure extends not only from the cable to the telephone outlet. Deutsche Telekom offers communication systems and individualized services, ranging from comprehensive consultation to complete call center equipment solutions including computers, software and headsets.

The RAIN project

The general situation of the ICT in Mecklenburg-Vorpommern is furthermore characterised by a low propensity towards innovation and entrepreneurship, and the emigration of ICT professionals. Quality of educational institutions was seen as a positive factor, as well as the adequacy of ICT researchers and professionals. The first results of the FP6 – RAIN project are showing that the region's geographic characteristics and the level of logistical alternatives are not sufficient to promote the development in ICT Sector [RP]. In a RAIN survey among regional experts the overall economic situation was also regarded as hindering, rather than improving, the development in Mecklenburg-Vorpommern. The respondents of the survey were pessimistic about the economic situation in the region and as specific regional problem the lack and price of private funding, and the insufficient co-operation between stakeholders were regarded as a disadvantage for Mecklenburg – Vorpommern.

Surveyed peer group in Mecklenburg-Vorpommern was also more critical in assessment of institutional issues. Legislation and governance in R&D activities and ICT sector business promotion were seen as hindering factors, even if the attitudes of regional authorities towards innovative actions were regarded as having positive influence. Most negative factor was the bureaucracy in setting up an ICT sector business.

In the topic addressing the ICT business potential, the assessments were distinctively pessimistic. None of the requirements were regarded as being fulfilled in the region. The only positive factor was the number of research groups in the ICT sector with commercially exploitable assets. The number of large enterprises with commercially exploitable assets was seen as an especially preventing factor. The survey also gave slightly critical view over previous policy actions in the region. A few of the respondents felt that the previous strategies or measures have not had any significance in the ICT sector development.

LogOn Baltic: Expert Interviews

Within the framework of the INTERREG III B LogOn Baltic project, an interview-like survey regarding regional logistics and ICT competence in Mecklenburg was conducted with experts between November 2006 and January 2007 [BP]. The surveys were conducted in form of a guided interview with help of a predetermined set of questions. All of the respondents were interviewed in Wismar, Schwerin or Rostock, whereas the interviewees are representing proved business experts.

This Expert Interview Report is based on the results of twelve conducted interviews, which can be classified in following categories:

1. Public institutions
2. Business Associations
3. Logistic service providers and - counselling
4. Retail
5. IT companies

The Managing Directors were available for the survey in all of the surveyed companies. The interviews lasted between 1 – 2 hours, and were recorded in form of written minutes. The answers are reproduced in the Report in form of a summarized overview, and not individually.

The regional strengths of the ICT lie – from the experts' point of view – in the existing infrastructure. The technical condition of the telephone network was especially highlighted beside the development of the fibreglass networks and a full digital dialling technology. Some innovative IT service companies already exist in the State. The missing integration of networks and the lack of extensive DSL-connections were considered weaknesses in the State, despite the good ICT infrastructure. So the experts stressed that an improvement of the networks and the DSL-connections for the region is required, laying emphasis on the extensive coverage of quick Internet connections. In particular, the lack of DSL-connections in many parts of the State should be solved in the short term through higher investments.

The structural underdevelopment in the field of ICT in the State was considered as a general weakness, referring at this point to the few computer science professorships at the universities, to the total number of innovative IT companies, as well as the number of young IT-graduates in Mecklenburg-Vorpommern. The State does not have a developed ICT-cluster with effective cluster structures like in other regions of the Baltic Sea, neither are the IT-actors effectively connected.

The networking level into regional IT-cluster is not highly developed despite the fact that there is an IT-Initiative Mecklenburg-Vorpommern but the available

structures are not equipped with the necessary means, and don't have sufficient public support to organize a lasting IT-sector in the State.

So the experts suggest the creation of an ICT strategy for Mecklenburg-Vorpommern, containing a supraregional part, as well as regional strategies for certain branches and regions. Like for the field of logistics, an agency for multilingual support in the field of ICT should be constituted to even out the existing deficit regarding internationalization. Furthermore, a central body for the placement of local and foreign IT-assignments for companies in the region should be created. The potential of the universities should be taken advantage of through a tighter cooperation between economy and universities.

The local IT companies dispose of IT-services focused specifically on the demand in Mecklenburg-Vorpommern, not enabling a supraregional development in the field of ICT, making it hard to address supraregional markets. With support of public resources in special areas, pilot applications (e.g. integrated port information systems) should be developed. They should also have a market outside of Mecklenburg-Vorpommern. To enhance the marketing of the regional IT-companies, a stronger integration into customer networks is encouraged.

LogOn Baltic: the ICT Survey

The survey is one of the tools for primary data collection used in the LogOn Baltic project. 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, and an optional module for region-specific questions. 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 has also been used as a complement in some regions. The main themes of the survey are:

1. General contact- and background information of the companies
2. Use of ICT in the companies
3. Use of the Internet in the companies
4. E-commerce / E-business
5. General assessment of the use of ICT in the regions
6. Region-specific issues [optional module]

The target group of this survey is the whole population of companies in the region. A total of 113 companies in Mecklenburg-Vorpommern have answered the ICT questionnaire, from which 66 percent are micro enterprises, 26 percent are small enterprises, and the remaining 8 percent is divided in equal shares among medium and large enterprises (Figure 1). This shows clearly that the economic landscape of Mecklenburg-Vorpommern is dominated by small-sized enterprises.

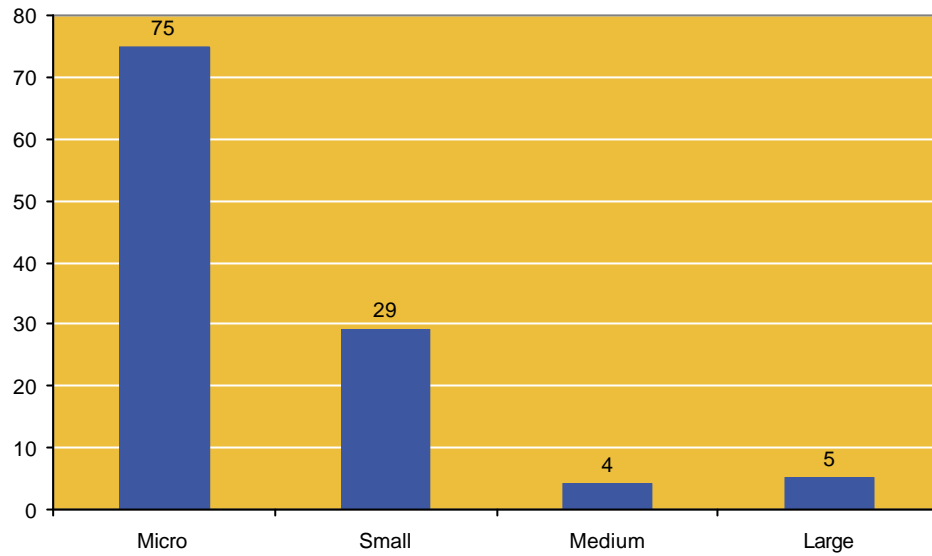


Figure 1: Size of surveyed companies

A big number of the respondents are from the higher management levels; 78 percent are Senior Managers and 6 percent belong to the middle management.

For the purposes of the project, three main industry branches were considered in the survey: manufacturing, trade, and logistics service providers. Enterprises not classified in these branches were considered as “Others”. From the total respondents, 34 percent belonged to the manufacturing industry, 7 percent belonged to the trading industry, and only 2 percent were logistics service providers. The remaining 57 percent fell under “Others”.

LogOn Baltic: Findings from the Survey¹

Use of ICT systems

ICT has had an important impact on the performance and competitiveness of enterprises, increasing information flows, improving production capacity, reducing transactions costs, and increasing the efficiency of management functions, among others. E-mail and internet have become very important tools in everyday life. In 48 percent of the enterprises, less than one fourth of their employees have an own company e-mail account; in 16 percent, between 26 percent and 50 percent of them have, and in 36 percent, more than half of the workforce had a company e-mail account. The figures regarding the access employees have to internet are very similar (Figure 2).

The fact that relatively so few have a company e-mail account or access to internet is directly related to the size of the enterprise: micro and small enterprises are usually shops or stores, where one computer or terminal is more than enough to manage the business activities.

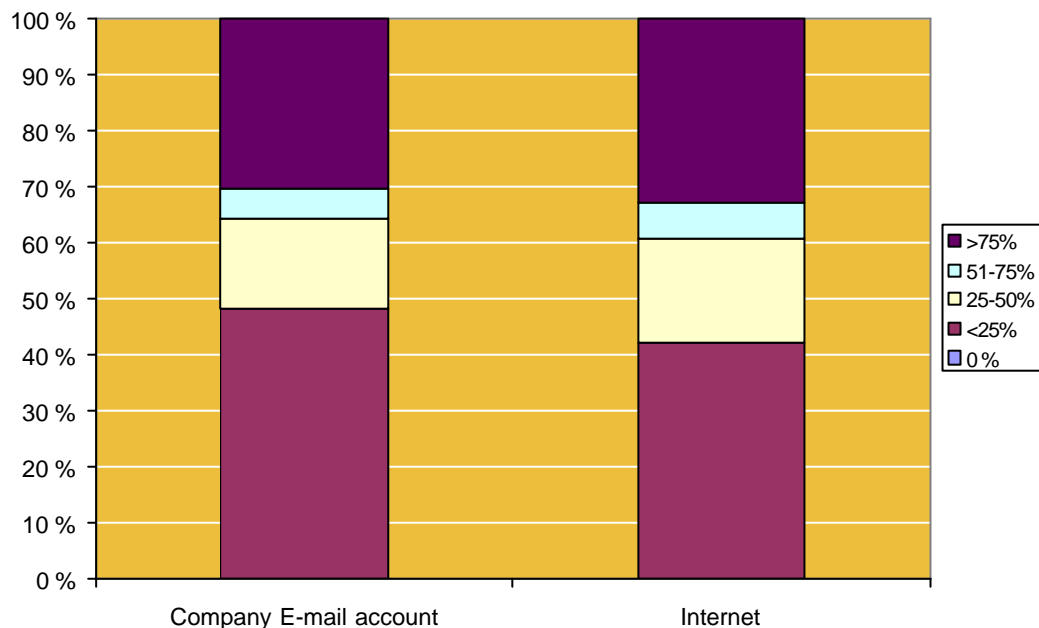


Figure 2: E-mail and Internet access of the employees

Figure 3 shows, up to what extent ICT is used in different business areas of the companies. In the following areas, more than half of the companies claim to be using different type of ICT for realising the different jobs:

- Accounting is the dominating area, with 86 percent
- Marketing & Sales is the second area in importance where ICT is applied, with 68 percent
- Purchase/Supply and Logistics/Stockkeeping are pretty much even, with 56 percent and 55 percent respectively

¹ [LB3]

Human Resources is the area where companies have still not implemented intensively ICT (23 percent)

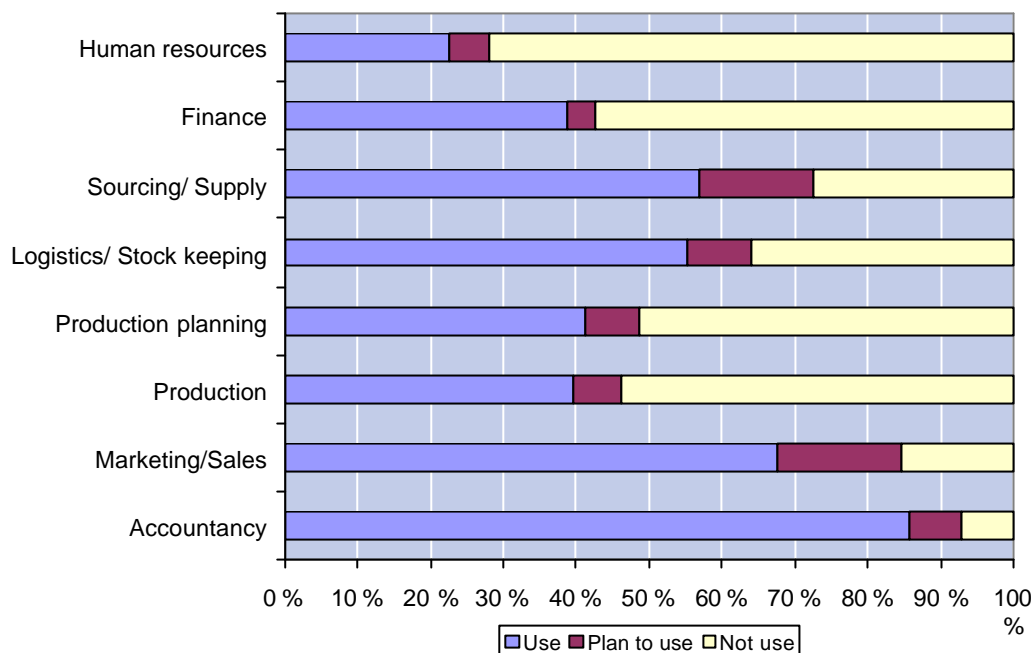


Figure 3: Business areas where companies are using ICT

Figure 4 shows how the companies in Mecklenburg-Vorpommern manage their IT departments: 28 percent of the companies have an own IT-department, while almost half of them let a third party administer this department. Close to 23 percent don't even have an IT-department.

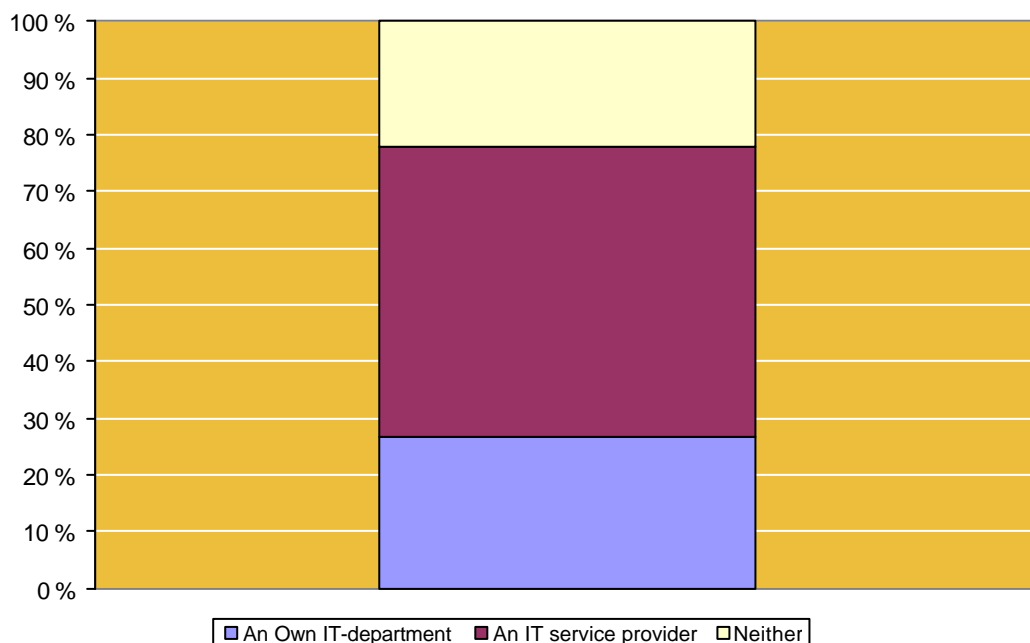


Figure 4: Outsourcing the IT Department

The estimated amount each company spent in 2005 for IT personnel, software, and hardware in relation to their turnover is shown in Figure 5.

Approximately every fifth company spent 7.5 percent or more of their turnover for IT personnel. Another 20 percent of the companies gave out between 2.5 percent and 7.5 percent of their turnover for personnel, and the remaining 60 percent of the companies' IT personnel expenses represented 2.5 percent or less of their turnover (27 percent of the companies didn't have IT personnel expenses at all).

13 percent of the companies gave out 7.5 percent or more of their turnover for software (only 3 percent, more than 10 percent). Another 20 percent gave out between 2.5 percent and 7.5 percent for software. Two thirds of the companies spent up to 2.5 percent (thereof, 8 percent didn't have software expenses at all).

In the case of hardware expenses, here also around 13 percent of the companies spent 7.5 percent or more of their turnover. But 29 percent of the companies had hardware expenses between 2.5 percent and 7.5 percent. Almost half of the companies surveyed (47 percent) had spent less than 2.5 percent for hardware, and 11 percent had no expenses.

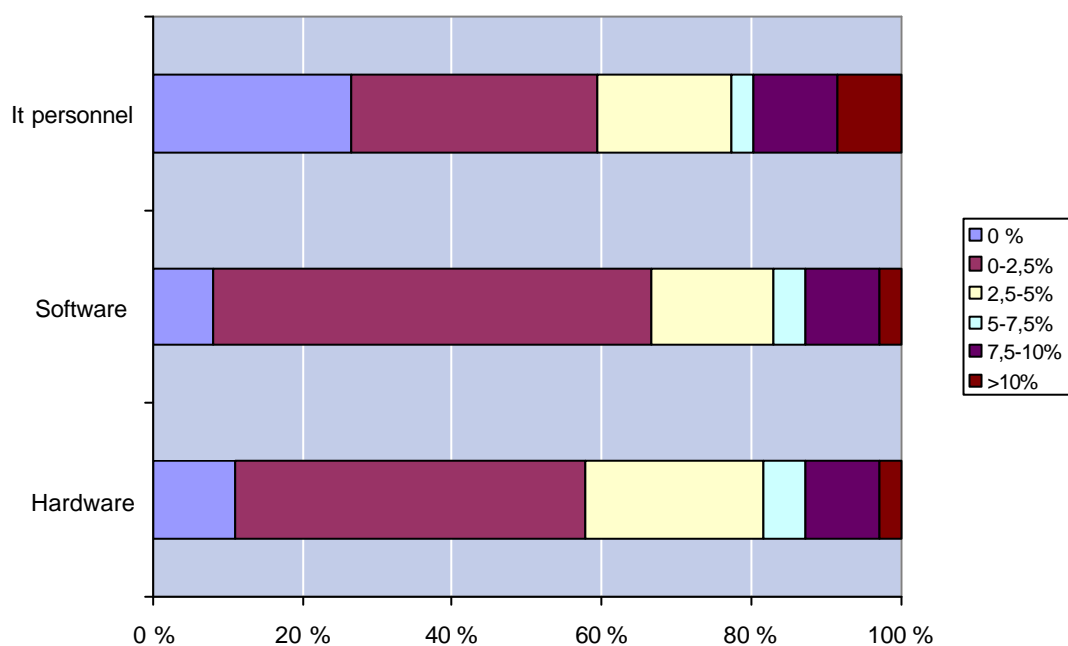


Figure 5: ICT expenses as a percentage of the company's turnover

Table 1 shows what the respondents thought about the future development of their ICT costs during the next three years. A very low percentage thought their costs would decrease (approximately 5 percent in each case), while about half of the remaining respondents thought their costs in all three items would increase, and the other half, that the costs would remain rather constant.

| | Decrease | Remain constant | Increase |
|--------------|----------|--------------------|----------|
| Hardware | 8 | 47 | 56 |
| Software | 4 | 51 | 57 |
| IT personnel | 5 | 49 | 51 |

Table 1: Future development of ICT costs

Information and Communication echnologies have become very important to business and society, ensuring the security of both the infrastructure itself and the critical information that runs through it. Therefore, information and network security are increasingly recognised as vital elements for ensuring wide participation in the Information Society.

From the 113 companies who took part in this survey, Table 2 gives an overview on how many actually have some kind of system / information security measures, and how many of them regularly use or update these security measures.

| | Available | Regularly used/ updated |
|--------------------------------------|-----------|----------------------------|
| Password access control | 90 | 92 |
| Virus protection applications | 99 | 104 |
| Computer firewall applications | 84 | 88 |
| Employee education on data security | 31 | 45 |
| Own documented data security program | 25 | 36 |

Table 2: Use of data security measures

In times where ICT can be a decisive factor of competitiveness, a regular evaluation of the costs and performance of the systems is recommendable. Most of the surveyed companies (94 percent) claim they regularly evaluate their ICT costs and performance internally (Table 3).

When it comes to compare the company's performance against selected suppliers, customers, or major competitors on a regular basis, the proportions point out an interesting variation:

- 57 percent monitor their performance with those from selected suppliers or customers; 20 percent don't do this at all
- 51 percent benchmark their IT performance metrics against those from their competitors; 28 percent don't do this at all

| | Disagree | Neither disagree nor agree | Agree |
|--|----------|-------------------------------|-------|
| We regularly monitor and evaluate our IT costs and performance internally | 1 | 5 | 94 |
| We regularly monitor and evaluate IT costs and performance with selected suppliers and/ or customers | 16 | 19 | 46 |
| We regularly benchmark IT performance metrics against our competitors | 22 | 16 | 40 |

Table 3: Monitoring and evaluation of ICT costs and performance

Use of Internet

In Mecklenburg-Vorpommern, 29 percent of the companies still use a modem for connecting to the Internet. 70 percent have a broadband connection (Figure 6).

Companies in Mecklenburg are slowly becoming more and more familiar with the Internet; 68 percent of them have a website.

61 percent of the companies have an external IT provider who designed and administers the company's website; 45 percent has an own IT department (or employee) who takes care of the website.

In some few cases, the company divided these responsibilities: they had outsourced the design of the website, while their IT-department / employee are responsible for the administration of the website.

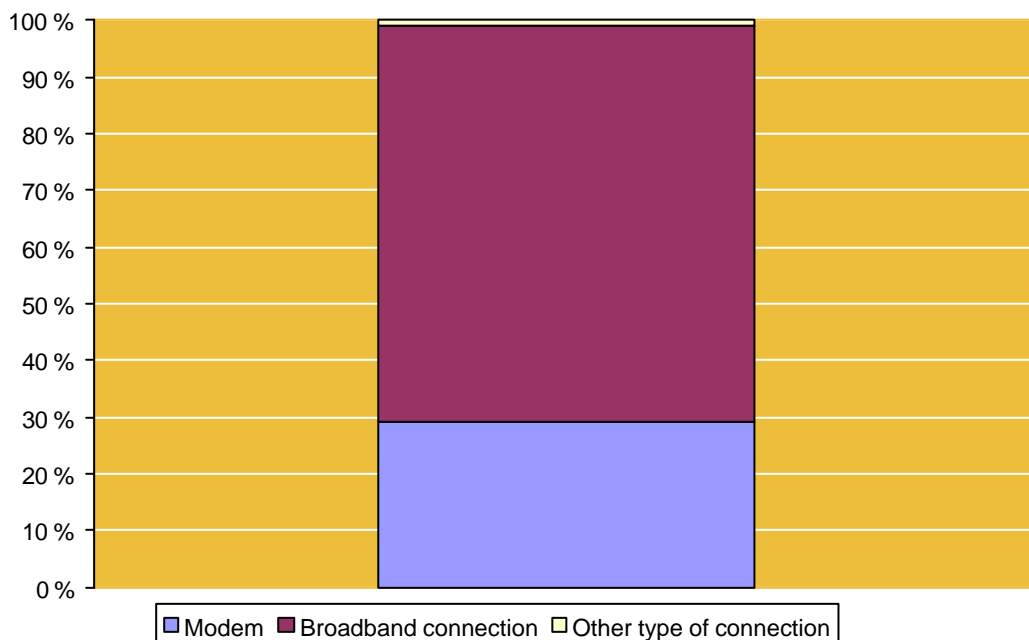


Figure 6: Type of connection

For the past decade, more and more companies have connected to the Internet. Internet use may range from simple website presence to the complete integration of business functions. According to Figure 7, the first statement seems to describe better the companies in Mecklenburg-Vorpommern; more than half of the companies have

the basic features on their websites: information about the company, about their products / services, and some type of contact possibility. Only about 14 percent use their website for online job applications.

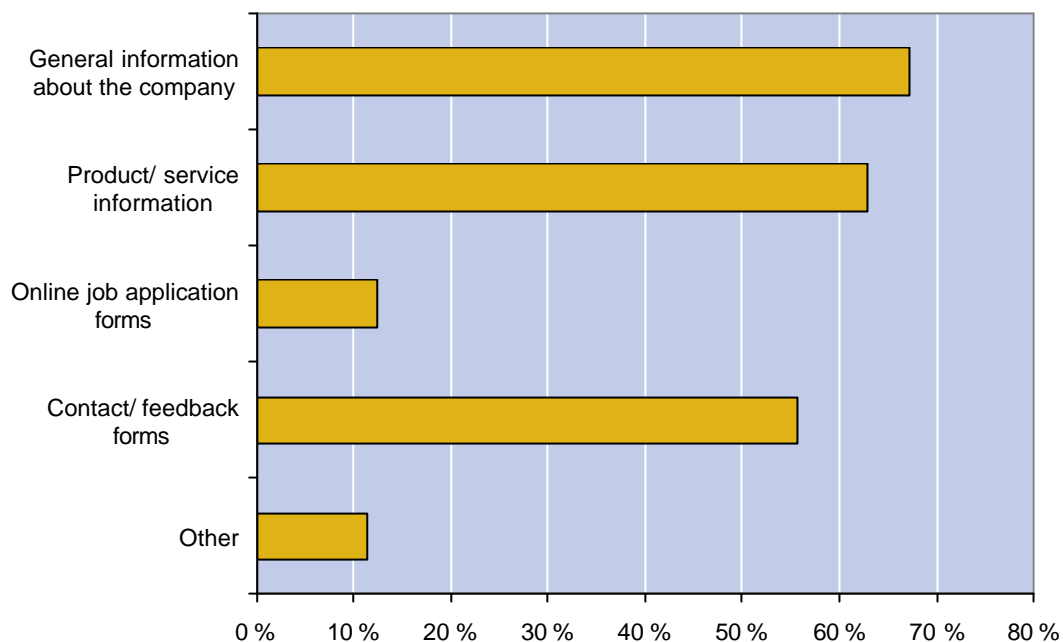


Figure 7: features of the websites

Not only do the companies use their website to interact with their clients / suppliers. National, local, or municipal authorities also provide different options for interacting with the users. Figure 8 shows whether if not the companies use Internet to interact with the authorities, and in what areas.

- About 20 percent of the companies don't use the Internet at all to interact with public authorities
- Nearly 47 percent use Internet for online payments to governmental organisations
- 35 percent of the companies use the Internet for downloading or requesting forms, while another 35 percent use it for completing and sending forms

In Mecklenburg-Vorpommern Internet is barely used for clearing goods through Customs; a big majority of the companies (87 percent) don't use Internet for this purpose.

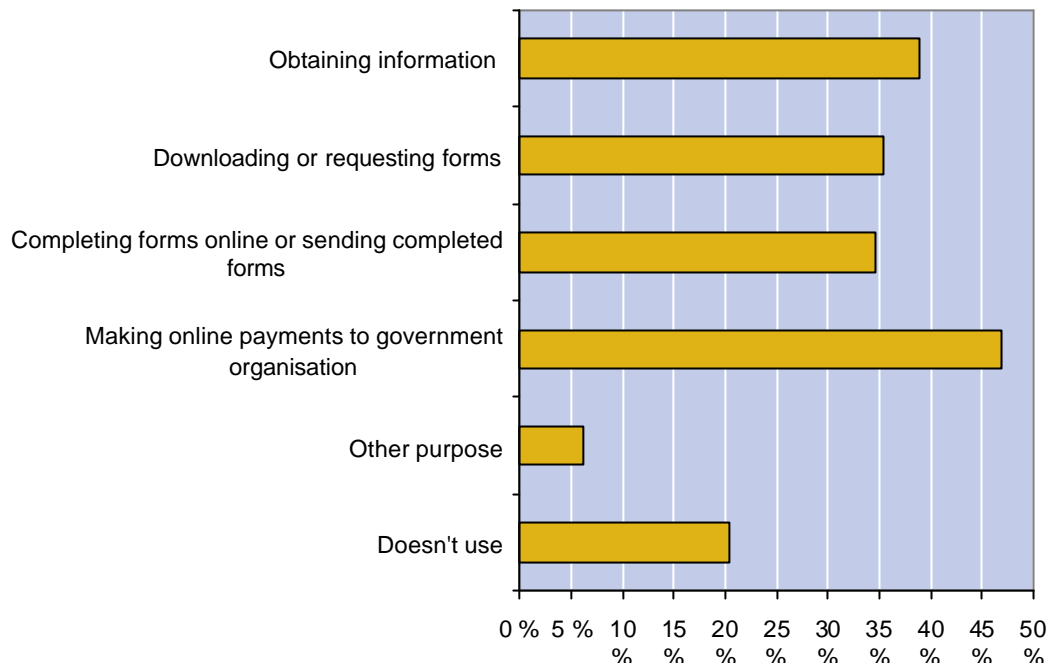


Figure 8: Interaction with public authorities and government organizations

E-commerce and E-business

The different methods the companies in Mecklenburg-Vorpommern use to establish contact on a regular basis with their suppliers and/or customers are shown in Figure 9.

A simple – but effective - telephone call to maintain a closer contact is used by almost all of the companies.

Replacing the regular post, the e-mail plays an important role in business communications; 84 percent of the companies use this method to communicate with their business partners.

Personal visits still seem to be somewhat important, although they are slowly decreasing; 69 percent of the companies still visit regularly their business partners.

Regular post and other methods are in the background compared to the abovementioned.

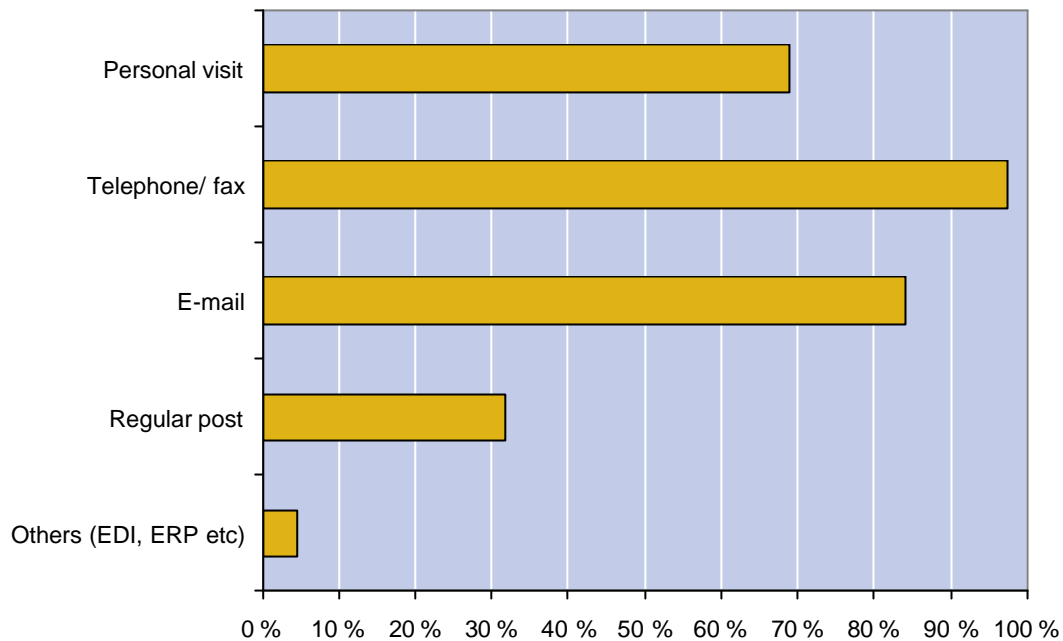


Figure 9: Communication methods used with customers and suppliers

Table 4 gives an overview, to what extent selected business processes between the companies and their business partners are handled electronically, and how they think this relation will develop in the next three years. Order placement and payment possibilities using ICT will drop with customers and with suppliers. After-sales support is the only process that is thought to increase among all partners. The opinion is still divided when it refers to track & tracing of orders; towards customers it will increase, but with suppliers the companies believe it will slightly decrease.

Especially noticeable is the proportion in the decreases; order placement and payment possibilities with suppliers are thought to be the processes which will decrease the most. On the other hand, increases are not as big.

| | Customers | | Suppliers | |
|---|-----------|------------|-----------|------------|
| | Now | In 3 Years | Now | In 3 Years |
| Order placement for products/ services | 71 | 66 | 102 | 75 |
| Order tracking/ service status available online | 31 | 35 | 57 | 56 |
| Payment possibilities | 53 | 39 | 65 | 40 |
| After sales support | 50 | 52 | 49 | 54 |

Table 4: Electronically handled business processes

The importance of e-business for the companies is expressed in Table 5. The companies in Mecklenburg-Vorpommern handle up to 60 percent of their business with their customers electronically. With their suppliers, the situation is a little

different; most of the companies perform between 10 percent and 60 percent of their business with their suppliers.

| | 0 % | 1-19% | 20-39% | 40-59% | 60-79% | 80-100% | Total |
|-----------|-----|-------|--------|--------|--------|---------|-------|
| Customers | 22 | 30 | 18 | 22 | 0 | 0 | 92 |
| Suppliers | 1 | 25 | 24 | 20 | 8 | 22 | 100 |

Table 5: Share of companies' business handled electronically

Furthermore, Table 6 reflects the perception of the companies on how they thought this percentage will vary in the future.

| | Decrease | Remain the same | Increase |
|-----------|----------|-----------------|----------|
| Customers | 2 | 32 | 75 |
| Suppliers | 0 | 40 | 69 |

Table 6: Development of e-commerce

E-commerce and its importance in everyday transactions has been gaining importance in the past years. Figure 10 shows that a major part of the companies agree that e-commerce help them improve competitiveness. Approximately 70 percent allege that e-commerce has a major impact on their profitability and that it helps simplify transactions. Little less than 60 percent assure that e-commerce helps them reach new customers and also improve their customer service quality. More than 60 percent claim that e-commerce gives the company a competitive advantage.

E-commerce doesn't seem to be so popular for reaching new suppliers; only 30 percent agree, while almost 45 percent disagree.

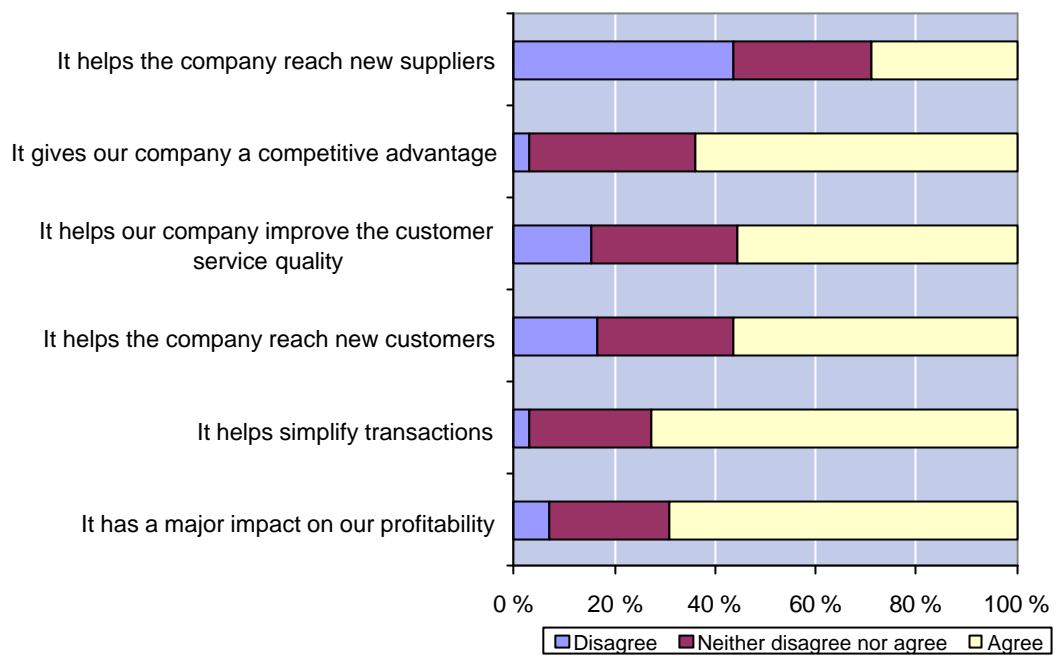


Figure 10: Importance of e-commerce

General assessment of ICT usage

Finally, the respondents were asked to assess the significance of several barriers for the present or future use of Internet, e-commerce and ICT in general in their companies.

By far, what seems to be the biggest barrier in Mecklenburg-Vorpommern is the recruitment of qualified IT-personnel.

A constant introduction of new software versions, uncertainty concerning contractual issues, and a low data communication are the barriers following in importance.

For most of the local companies, the lack of perceived benefits, the high ICT expenditures, and the reluctance of the personnel to use ICT, don't seem to be that big of a barrier in the region; these factors are not considered to have a negative effect on the use of Internet, e-commerce or ICT in general.

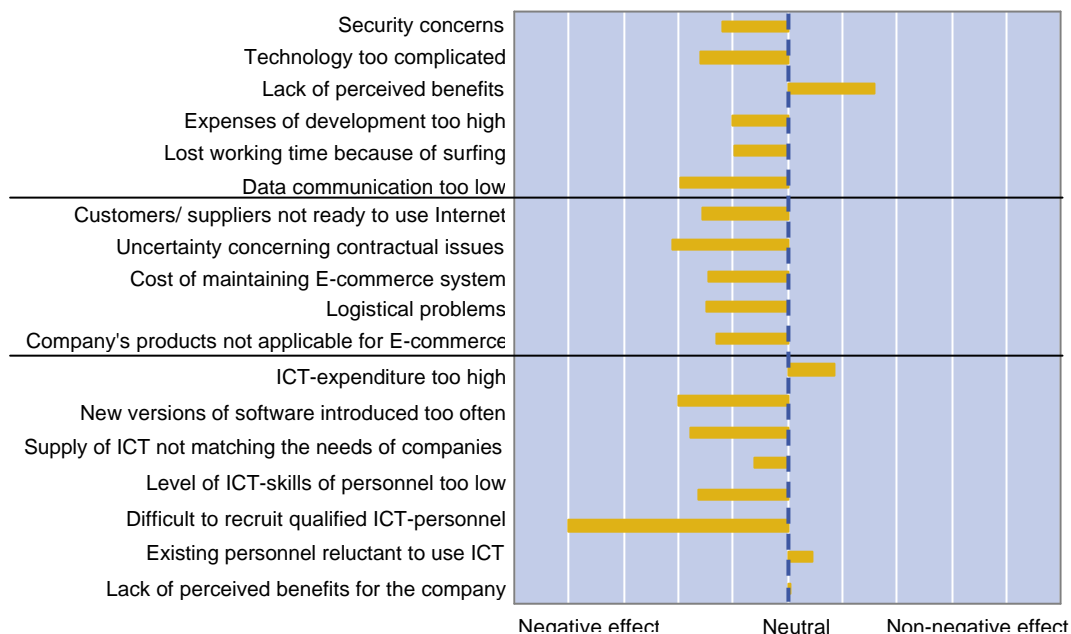


Figure 11: General assessment

Final comments

Although the number of responses could have been higher, the fact that 113 companies participated in this survey in a period of only 4 months is quite encouraging. With more time, the results obtained might have been more accurate. Nevertheless, the obtained results of the ICT Survey are representative of the general situation and infrastructure of ICT in Mecklenburg-Vorpommern.

As mentioned already in the introduction, the final version of the Survey Report and the comparative report (comparing the ICT infrastructure in the participating regions) will be available on the project homepage www.logonbaltic.info.

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