With the support of the Erasmus+ Programme of the European Union

Further training program "Realisation of customer-centred Innovations"

Modul 13 SME fair digitization

Teaching Material 6 Digitalization in SMEs

Content

Part A: SME-fair digitalization

An impulse for further critical thinking

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Introduction

The term digitization is used to describe the possibility of converting analogue data (text, images, sound) into digital formats with which information technology data processing is possible. The increasing use in production, logistics, administration, etc., but also in everyday life, has led to an expanded understanding. In addition to the advantages of digital transformation (speed of information dissemination, networking of systems, cost advantages), the risks are also being addressed. These range from job losses and fears of data manipulation (hacking) to changes in social and communication behaviour. Emotions are polarized; they range from exaltation to uncertainty, from a positive attitude toward life to bitter rejection.

It is clear that the dynamics of technical developments are making profound changes possible in many applications. It is not always questioned whether these are in the interest of the users or only serve individuals (manufacturers, interest groups). The basic validity of the statement that technology as a basis and application as a possible use case can be designed, seems to have eroded.

It must be examined whether and to what extent digitization can still be shaped and geared to the needs of small and medium-sized enterprises: Are the applications suitable or adaptable for use in the skilled trades and SMEs?

The authors are certain that digital applications have considerable potential for use and benefit. They do not fear that there is not enough innovative power to find the right applications. However, they argue that it is not enough to rely on industrial development. Rather, it seems necessary to have an independent digitization strategy and to use the "market power of SMEs" to drive forward digitization in line with the craft sector.

With this article, the authors want to provide an impulse for formulating a concept for digitization that is appropriate to the trade. The Knowledge Alliance for Human Resources project is a suitable forum for dialog with companies and employees, with chambers and associations, and with research and consulting organizations.

We look forward to your constructive, thought-provoking, critical comments, suggestions and initiatives.

Guiding questions: Crafts and digitization

Craft[1] is characterized by a close connection of hand, head and heart:

+ Hand for the skillful creation of goods and services,

[1] „In view of the large number of trades (in Germany, 41 trades requiring authorization, 52 trades not requiring authorization and 54 trades similar to trades are listed in the Handicrafts Code), there is no such thing as "the" trade per se. A differentiation is necessary, but can be omitted for the argumentation here.

+ Head for the expert and professional planning and execution as well as for the competent, experienced ability to improvise,
+ heart for the quality of the work, the "work", the cooperation, the orientation towards the abilities and the well-being of the employees as well as the satisfaction of the customers.

What happens in these three dimensions during digitization?

¿ Will the hand be replaced by networked, self-learning machines?
¿ Is the head being replaced by algorithms?
¿ Is the heart being replaced by economics?

To be decided:

- What kind and what degree of penetration of digitization do "we", i.e. "society", want?
- What type and degree of reach of digitization do the crafts want?
- What type and scope of digitization is needed - or should be avoided - in order to satisfy customer wishes appropriately, to be able to provide craft services of a high quality at a reasonable price?
- So: what kind of craft do we want?

And more broadly, the following questions, among others, need to be answered:

- How can the interest of the craft sector be channelled in such a way that the manufacturers of digital machines and processes are guided by it?
- How should vocational training be designed so that proximity to materials, tools and products is taught in such a way that alienation from the hand is low, the head is not modularized, and the use of digital techniques is mastered individually and with organizational data autonomy?

Brief history of crafts, industry and digitalization

The development of culture happened and happens through active engagement of man with nature. Through the development and use of tools, the relationship to the environment and to oneself was changed. Several millennia passed from the first stone tools to more refined tools in the Iron Age. About 5,000 to 10,000 years ago, the first specialized crafts emerged through "professionalized tool use" that required long training and practice to achieve good results suitable for everyday use. Since then, there have been continuous innovations as production-related improvements in tool development, in processing methods, in manual skills, in work organization and in product- as well as customer-related services.

The crafts in a constant process of change and therefore have no version numbering that is somehow applicable (Craft X.0).

The first guilds as associations of master craftsmen were founded in the Middle Ages. Fishermen, bakers, saddlers, tanners, shoemakers, blacksmiths, stonemasons, weavers and

many more joined together to form social and economic alliances. Among other things, this ensured production quality and regulated training.

The mechanized processing possibilities, initially still with human drives, then through the use of waterpower and steam engines, and the development of an infrastructure for the transport of goods and people (railroad) provided - with further social and economic changes - for a profound change in employment and working conditions. An industrial mode of production, also based on changed driving forces and mechanical production possibilities, began in the 18th century. Since then, industrial development has continued through technical and economic innovations. Decisive changes include electrification with developments toward cycle-based manufacturing (assembly line production) and process manufacturing (chemistry) in the first half of the 20th century and the use of electrical and information technology components for increased automation (e.g., programmable logic controllers) in the second half of the 20th century. The digitalization that has already begun is being continued through the networking of systems, sensor technology, technical assistance systems for information processing, and the like, with the vision of creating "artificial intelligence.

The way technology is used, and this is the central argument here, changes the form and scope of the possibilities for physical and thus human appropriation of the world.

In all previous fundamental pushes of innovation that led to the formation of technical-infrastructural interconnections, a fundamental and conflict-rich process of formation was required. Private railroads became an integrated rail network only through state regulation after bitter competition. Energy supply systems are regulated in oligopolies (plus smaller suppliers). Mobile phone coverage by private companies is channeled with state network operating regulations. In all cases, qualifications and competencies have also been restructured, knowledge has been re-codified, etc. We call this process of generating regulative/regulatory structures quite generally "social consequences of technical innovation." - The current debate about the use - and increasingly also about the benefits and risks - of digital systems is in this phase of the formation of norms and rules for structuring the social network of interests.

Cross-company regulation always occurs when corporate interests (shareholders) lead to cut-throat competition (monopolistic market power) and the interests of the users (stakeholders) are not adequately taken into account. It is not clear, for example, who will ensure, in what form and to what extent, that the product quality of virtual systems (algorithms, data use, source codes) can be checked by users for their suitability in the same way as analog products (armature, ... table, ... dental implant).

However, the real challenge in information technology innovation does not lie in the question of ordered networks, as it is expressed, for example, in the discussion about the provision of fiber optic broadband networks. Much more important is the debate - albeit still inadequately conducted - about the power of disposal over data and over (global) knowledge. Should/should it be in the "hands" of a few companies such as Apple, Google and similar market-dominating enterprises or, in view of globalized markets, is there not rather a need for international agreement on a basic digital structure that safeguards democracy?[2]

[2] See, for example, the proposal for a "Charter of Fundamental Digital Rights of the European Union". Initiative of the ZEIT Foundation, December 2016

Tool use and digitization

Digitalized technology applications are not fundamentally unsuitable for use in the skilled trades. The use of computer-aided design and manufacturing processes (CAD, CNC, CAM, ...), measurement and control technology, robots and handling systems, 3D printers, B2B- and B2C-oriented data exchange, etc. testify to a feasible integration into a number of trades.

What's more, planning and manufacturing processes equipped with digital technology are (could be) predestined for use in the skilled trades, so to speak. They enable flexible processing with small batch sizes. They guarantee high adaptability with quality-assuring standards. They can imitate manual machining processes and reproduce excellence.

However, digitization also changes the character of the tool and tool use. The sensory-physical experience of machining materials, of using (partially) autonomous tools and machines becomes different when the distance between hand and head is too great and too indirect. Numerical models do not really lend themselves to the physical appropriation of reality.

What are appropriate tools for the crafts? What will hand-work be? How can the experiential value of grasping be preserved as an essential prerequisite of thinking and planned action?

It will have mental and psychological effects on the users if the immediate appropriation of the world no longer takes place through the use of tools on the work material but is generated virtually. How are the real possibilities of shaping reality explored and mastered?

What can be learned from this social-historical reflection - which is certainly very abbreviated here?

- Technological/technical development is interest-driven. It does not fall from the sky but is shaped - and thus can be shaped.
- The outcome of the design/adaptation process, the "making society capable" of technology, is not technically determined, but depends on the assertiveness of the participants, i.e. on negotiation processes, historical coincidences, the course of events and the outcome of conflicts. [Already at this point it is to be noted: In this regard the handicraft should interfere consciously and organized!]
- The "social" character of the trades, the shaping of the self-image and the image of others, will also have to be debated.

State of digitization in the skilled trades

The level of digitization in the skilled trades appears to be comparatively high. According to the "Digitization Index for SMEs", 56% of companies use digital/IT-based applications, particularly in the areas of IT security and data protection (63%) and in customer relations (56%). However, these values only show the surface of what are, in the majority, rather low-threshold applications of information and communications technology.

The study by the ZDH and Bitkom leads to more differentiated assessments. Although 58% of companies use software solutions in the office, less than a quarter use them for content management or resource planning. The share of digital technologies for maintenance or in the production of goods is less than 10%. The development of digitized business processes is not yet widespread, nor are applications based on the "Internet of Things".

However, there is no differentiated, trade-specific survey of applications. The assessments of the use of digital technology and of productivity expectations shown in the studies are very general and do not provide a valid forecast.

In this respect, it can be stated - with the necessary caution - that digitization in core craft processes has not yet really taken place on a broad scale.

Thesis 1

In principle, digitization geared to industrial production ("Industry 4.0") is not per se appropriate for the skilled trades.

At the same time, however, it is also true that industrial production always includes a proportion of craft application processes, in which the training of tools that is appropriate for people, promotes knowledge, uses skills and stimulates imagination is and would be useful in the future.

What digitization does the skilled crafts sector need?

In order to ensure the future development of the skilled crafts sector, it is necessary to examine whether and in what form digitization is suitable, i.e., applicable, appropriate and useful, for supporting skilled crafts production and services.

The skilled crafts sector certainly does not need to adapt to what others are doing for them - and not primarily for the skilled crafts sector. It certainly doesn't need all business data to disappear into third-party clouds. Many craft businesses do not need digitized business processes or digitized process management. And automated production is not necessarily compatible with craft manufacturing. Moreover, it is not clear how many potential buyers will use smart technologies, that tracking apps and online orders will bring the skilled trades masses of orders, and that digitization will mean greater satisfaction for workers and customers.

So what does the craft sector really need if it wants to maintain its uniqueness, its diversity, its creativity ...? What does it need to support the provision of services? What does it need in order not to go down in the maelstrom of "digitalization as a production motto" as a vicarious agent of industrialized market power and as an extended work/service bank?

There is no doubt that digital technologies can be usefully employed in the skilled trades. But this is - despite all the quasi "natural" application - not self-evidently suitable for the skilled trades.

Thesis 2

In a cross-company sense, the specific interests of companies and employees must be formulated as requirements as a guideline. This also includes clarifying who has the right of disposal over the data and who structures the networking of machines. This requires a negotiation of the division of labor between the skilled trades and the producers of digital technology.

Thesis 3

The skilled trades need a digitization strategy oriented to the needs of the respective trades, i.e., a specific plurality of approaches - coordinated and integrated at the level of the overall

organization - for which digital tools and networks should and can be used to support the work. What is needed first and foremost is an orientation toward the company's own qualities, its original products and services, the conditions under which work is to be done, and the wishes of the customer - and only then a technology geared to these qualities that supports the achievement of the goals.

Thesis 4

Digitization - or, more generally, the use of technology - and organizational implementation should therefore be the result of a strategy and not the starting point for conceptless change hysteria and a lack of orientation in the wake of "we need that, too. What needs to be developed is a proactive concept aimed at maintaining craftsmanship, high-quality services and plants, and quality of work for the employees.

It is still necessary to maintain traditions and at the same time to develop them further, to use traditional advantages and to actively shape modernity. In other words, the (desired) technical consequences of social innovation must be examined.

Digitization in the skilled crafts sector - organization of adaptation

The fact that the skilled crafts organization has devoted itself intensively to this topic and formulated an orientation and basic requirements in the form of the position paper "Digital Agenda for the Skilled Crafts" and ensured a work-sharing development structure by setting up the decentralized association "Competence Center Digital Skilled Crafts" certainly has great advantages.

The competence center "supports small and medium-sized craft enterprises in tapping the technical and economic potential arising from the digital transformation. To reduce information deficits, the competence center provides decision-makers and experts in the skilled trades with practical information, qualification and support services:

Production and automation
Digital processes (process management, use of production IT)
Digital business processes (services, service ideas)
Information and communication[3]

Information, qualification and support for individual companies are good and important. However, they do not fill the gap in conceptual orientation. In order to achieve a specific, trade-specific application of digitized tools and services, a proactive and trade-differentiated strategy needs to be developed, i.e.

- More knowledge about the needs, possible applications, use and benefit expectations of (digital and analog) technology in various trades.
- Assessments of other/further developments (markets, customer requirements, consequences of demographic change, etc.) and their possible effects in the skilled trades.

[3] https://handwerkdigital.de/

Learning from the future

In order to be able to deal with these aspects properly, a dialog must be conducted on the desired future of digitization for the skilled trades. On the one hand, the tried and true must be transformed, and on the other hand, the new must be explored. A design process needs to be initiated in which a balance and new equilibrium between preserving and finding new things can be achieved.

This will certainly be a longer-term and ongoing development process that evaluates experiences and reviews the achievement of goals in order to be able to implement necessary adjustments quickly and flexibly.

For a systematic and valid development, country-specific exploratory studies would have to be designed, which would have to be coordinated with the organizations of the skilled crafts, the chambers of skilled crafts, trade associations and guilds, research institutions close to the skilled crafts and educational institutions.

To start with, a series of future forums based on the basic concept of a future search conference is proposed. In principle, it can be used for

- the development of common visions and practical actions in dialogue between different (interest) groups
- the development of a plan and the achievement of agreement for the implementation of visions or strategic decisions
- initiating rapid activities in the context of complex tasks that have not yet been coordinated and for which there is not yet a common vision".

Future Search is based on four fundamental principles:

- Bringing the "whole system" into one space
- Exploring the common big picture ("the whole elephant") as a background for local activities
- Focusing on future and commonalities instead of conflicts and problems
- Inviting self-organization and personal responsibility for activities during and after the conference.

Overall, the exploratory conferences (and then the in-depth studies) should have four essential elements:

(1) "Barometer of the present" - description of the actual situation

- What is the actual state of analog and digital technology application in selected relevant trades?
- What qualifications are available for the use of various digitized tools and machines? What skills are taught for mastering complex systems and processes? What competencies are taught for mastering the requirements in order to navigate purposefully in an environment subject to dynamic change?

- What is going well in terms of technology use, organization, employment, work, competence, etc.? / What is critical ...?

(2) „Trends"– Assessments and expectations

- Which technology-related innovations are planned or expected?
- Which organizational and work-related (content-related, methodological, ...) consequences of technology-induced changes are planned/expected?
- Which social consequences (work, employment, organization, competence, ...) of technical changes are expected (feared, hoped for)?
- Which technical consequences of social changes (e.g. demographic change) are expected?
- Which technical and which interdisciplinary competencies are expected to be needed to drive and master the technical-organizational-social innovations?

(3) "Learning from the future" - visions for a "sustainable skilled crafts sector / for digitization in line with the skilled crafts sector" - with the focus on "competence requirements".

- What ideas can be developed for a traditionally modern skilled crafts sector that offers excellent services for customers and outstanding working conditions for employees?
- How can the culture of user autonomy be secured?
- Which organizational and work-related (content-related, methodological, ...) changes/innovations are desirable?
- Which technology can/should support/promote "social innovations"?
- With which competencies can the sustainable craft be sustainable?

(4) "Actively shaping the future" - strategies and concepts

- What goals best describe a desirable sustainable craft/trades A-Z?
- What strategies are needed to achieve these goals?
- Which technical, organizational and social design options should be developed?
- What content and forms of training and continuing education are required for digitization that is appropriate for the trade?
- What does the implementation concept look like? (Who will do what and by when?)
- What kind of training is needed for these applications in the skilled trades? What should and can be the content of continuing education and lifelong learning?

Excursus: Procedure of the Future Forum and possible participants

The (invited) participants represent "the whole system" (craft) or a large cross-section of the system. They provide and examine information. They work independently in small groups and plan goals and measures.

In the first phase, homogeneous groups (one industry, one hierarchical level, one professional group or similar) discuss. In the vision phases, the composition of each small group is such that it represents the entire system as far as possible (maxi-mal mix).

- The cooperation agreement on a forum includes few rules:
  + All perceptions are valid.
  + Differences and issues are acknowledged and explored, but there is no attempt to work through them or get caught up in them
  + Participants look for commonalities.
  + All information and results are logged.

The Future Forum has an ordered structure (topics, time, moderation) and lasts about two days.

The participants should be composed of different groups, with each group comprising as many people as there are differentiated groups.

For the forum presented here, the following composition might be appropriate:

Trade A - x (approx. 4)	e.g. electrical engineering/electronics, metal construction, main and ancillary trades/construction	Owners, master craftsmen, technicians/engineers, training managers
Customers		
Technology and competence centers		
Manufacturing and service companies		IT Company Data Security
Educational institutions of the skilled trades, vocational schools, vocational academies		
Chambers, guilds, trade associations; trade union(s)		Management Operations/Technology Consulting
Research institutes and research funding Others		Vocational education, business studies, history, sociology, work and organizational psychology, economic philosophy and ethics, economics, ... e.g. specialized publishing houses, editors

Table 1: Stakeholders involved in the Future Forum

The five phases of the Future Forum are explained below and summarized in Table 2.

The dialogue starts with an examination of the present from the perspective of homogeneous groups. The representatives of a professional group or a system area assess the current "highs and lows" (what are we proud of - and what do we regret?) and then present the results in plenary. - A common knowledge space about all represented groups is created.

Task	*Content*	*Form of dialogue*
1. past [world, self]	Past: What are we proud of and what do we regret with regard to digitization	Homogeneous (professional) groups
2. present and expected (external) trends	What are the influencing trends / What do we expect with regard to digitalization and other influencing factors (demographics, globalization vs. local action, ...)?	Mind map in plenum
3. future - desired visions	Visions of the future	Gruppen mit maximum diversity
4. similarities	Explore commonalities	Gruppen mit maximum diversity
5: Plan measures, define procedure	• Selecting the three most important commonalities (goals) • Work out instructions for the implementation • Make agreements	Evaluation (prioritization according to need for action and possibilities for action) in plenary session

Table 2: Development phases in the Future Forum

In the second phase, all participants create a common mind-map on the recognizable (expected, hoped for, feared) trends and challenges of the topic. These are then evaluated by the various groups involved (e.g. companies - intermediaries - research) according to the degree of influence (need for attention, importance of the trend), e.g. with points in different colors for the groups involved. In the case of great agreement, there are trends and challenges that are scored with all colors and thus indicate a consensus in the evaluation and those that are considered important by only one group and thus indicate a disagreement. In this way, commonalities and differences among the participants, i.e. in the system, become clear and accessible to a joint dialog.

In the third phase, participants are assigned to new groups so that each small group represents the entire system (maximum mix). The focus here is now on the development of visions for the future: "Digitalization in line with the skilled trades - what will we have achieved in 2025!"

In the fourth phase, the proposed measures go through a democratic bottleneck by establishing a consensus in the groups or in the plenum as to which are the most important proposed measures. For this purpose, thematic clusters are structured and transferred to a priority list.

Finally, agreements on further steps, activities, responsibilities, etc. are made together.

The central focus of the Future Forum should be on the development of a common goal orientation for digitization in line with the needs of the skilled trades, but can also concentrate on particularly relevant aspects, e.g., competence requirements.

In-depth Studies: An Outlook

Studies on the topic of "digitization for the skilled trades" would have to be broadly based in terms of content and trade-specific features. In addition to a trade-wide, trade-differentiated

written survey (which can necessarily only include a few questions), the as-is analysis could be linked to the specifics with qualitative assessments obtained in workshops with people from organizations (chambers, guilds, trade associations), universities/universities, institutes and companies as well as in case studies. It will also be necessary to investigate what motives (younger) people have for working in the skilled trades (or not in the skilled trades) - and what expectations, fears, hopes ... employees in the skilled trades associate with "digitization".

A trend assessment of expected developments could be made on the basis of a literature analysis with a Delphi survey of experts.

On the basis of these findings, future competence requirements should be assessed. In comparison with existing offers and already planned innovations in education and training, the additional need for knowledge and skills should be described and submitted to the institutes and committees for further processing.

Conferences/workshops with dialogical methods (Open Space, Future Search Conference or similar) are suitable for the formulation of approaches for the strategic orientation, solution concepts and design requirements.

Possible approach

(1) Conduct future forums as initial for practical and strategic orientations.
(2) Checking whether an in-depth analysis and an exploratory study is necessary/desired
(3) Rough sketches for exploratory studies
    (a) Coordination with associations, chambers, institutes, etc.
    (b) Exploration of funding opportunities

Detailed conception and application

Part B: Digitalization in the smallest companies

Contemporary situation in the region Satakunta, Finland

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Introduction

The digitalization is one of the phenomena, that are causing the biggest changes and challenges in the field of entrepreneurship, and in the working life. The European Union has included the digitalization as an essential part of its agenda 2030. The digitalization is both a tool when gaining the goals of sustainable development, and a goal by itself.

During the implementation of test training "Digitalization and HR" in Finland it was found out, that it was very hard to motivate the small and medium size enterprises, and particularly those with 1-5 employees, to participate the training. The denying was mostly reasoned with the lack of time, the Covid19 era, or other reasons caused by the exceptional locked-in situation in Finland. However, in most answers gained, there was also a negative tone concerning the phenom called "Digitalization". The entrepreneurs did not find it necessary to train nor to study this topic.

On the other hand, the workers, and their trade unions (For ex. PAM and SAK) find that digitalization will have an important role in future work life and have in publicity required more investments into training and education to increase the preparedness of the workers to adopt the new skills.

This juxtaposition between employers and employees in the smallest companies is not yet visible, but it may lead the smallest enterprises into lack of skilled young employees if the potential workers are seeking job places in which their skills and willingness to learn new things are valuated. To avoid this kind of situation, to prevent the conflicts between the smallest employers and their employees, and to support the humanization of the working life, it has been found necessary to raise a discourse concerning the digital maturity of the smallest enterprises.

To be able to do this, an analysis of the contemporary situation, i.e., of the digital maturity of the smallest companies in Finland, as well as in the other countries involved in the project KA4HR, was found necessary be done. The research consisted of semi-structured interviews and questionnaire directed to owners and workers of randomly selected enterprises in fields of construction, tourism and welfare and beauty services, was designed. The results were expected to

give a picture of contemporary situation and address the areas in which there are most to be done. It was also considered obvious, that conducting the research would act as a source of inspiration and raise an interest in training and education.

Satakunta University of Applied Sciences has designed and conducted this study as a part of project KA4HR.

The frames of the research

Satakunta is a region located in the west coast of Finland. In the area there are two bigger cities, Pori, that is the capitol of the region, and Rauma. Both cities are seaports, partly competing each other in the branches of export and import transport, although both have specialized to certain types of freight. Both Pori and Rauma have traditionally been industrial cities. In Pori, in addition to port and shipyard, the heavy mechanical engineering industry, metal industry, chemical industry, lumber and paper industry, and textile industry were big employers until the end of 1980's. In Rauma, the port, shipyard and lumber and paper industry were big employers, and even if there were big restructuring during the "Big Finnish Depression" in the beginning of 1990's in Rauma too, among the list of most remarkable employers there are still shipyard and lumber industry.

Between Rauma and Pori there is Olkiluoto nuclear power plant, the third reactor of which has now been built for 30 years. In Harjavalta the heavy industrial park has succeeded to save its status as big local employer, attracting also new industrial plants like the green hydrogen industry. Kankaanpää used to be known of its footwear, house building and brickyard industries, and in the end of 1980's there were built new metal and construction material industries. However, the economic collapse in the beginning of 1990's, the shutdown of soviet business and reorganization of Finnish construction industry ended the work of most footwear-, brickyard- and house building workers, and after that the economic activities in Kankaanpää have not reverted to type.

However, during and after the great Finnish depression many of those having been left unemployed started a new career as entrepreneurs and subcontractors of their former employers. They found also new contractors, like RMC (Rauma Marine Constructors), Olkiluoto nuclear plant, or Heavy industrial park at Harjavalta, who, bearing in mind the lessons of depression, preferred subcontractors in almost every level and task instead of hiring their own staff. This enabled the birth of new SME-businesses, not only in traditional branches, but also in maintaining, industrial services, designing etc., some examples to be given.

Figure 1: Region Satakunta and its connections (Source: https://satakunta.fi/satakunta-aineistot/)

Ulvila has during the past years become a centre of automation and robotics industry whereas Huittinen, Säkylä and Eura are still very agricultural with only few industrial enterprises. However, particularly Huittinen has within the 2020's succeeded to attract new enterprises and entrepreneurs to the municipality.

In the year 2021 the total number of businesses in Satakunta was about 13200 enterprises. At least 9000 of these were so called micro enterprises with 1-4 employees. (Satakuntaliitto, 2021) The "at least" is due to the fact, that in the statistic there are 2800 enterprises whose number of workers is

unknown. Either they are individual entrepreneurs with no employees or there is some other reason why the number of personnel is unknown (Table 1). It is good to realize, that the next steps up to the limit of SME-criteria are all together only 1129 enterprises, thus, the smallest enterprises are playing, despite of their size, a very remarkable role in the economy of Satakunta.

Table 1:Number of enterpises in Satakunta (Satakuntaliitto, 2021)

Number of enterprises per personnel	
Size of personnel	**Number of enterprises**
A Not known	2 837
B 0 – 4	9 012
C 5 – 9	591
D 10 – 19	431
E 20 – 49	224
F 50 – 99	76
G 100 – 249	31
H 250 – 499	15
I 500 – 999	4
J 1 000 -	3
Total	**13 224**

The enterprises represent a variety of branches. Some of the enterprises are active in more than one branch, thus the total calculated out of the list of branches is bigger, 16763 items.

Table 2: Enterprises by branch in Satakunta (Satakuntaliitto, 2021)

TOL2008 - branch classification by Stat.fi	Number of enterprises
G Whole sale and retail trading, maintaining of motor vehicles	2580
F Construction	2444
M Occupational, scientific and technical activities	1716
C Industry	1536
A Agriculture, foresting and fishing	1401
S Other services	1355
Q Health and social services	1036
H Transport and warehousing	1001
N Administrative and supportive activities	801
L Immobilities	604
I Accommodation and restaurant business	555
R Arts, enterntainment and recreation	447
J Informaton and communication	392
K Financing and insurance	309
P Education	294
D Electricity, gas, heath and cool	80
E Water, waste water and waste management	75

B Mining	62
X Unknown	44
O Governmental and military activities, Obligatory social security insurance	29
T Households as employers	1
U International organisation	1

The settings of the research

The research was designed, conducted, and analysed within a very limited period in the autumn 2021. Thus, the process had to be kept as simple as possible. First phase was to design and test the questionnaire used to gather the data. After the questionnaire was tested by one of the interviewers with some voluntary interviewees, the corrections were made, and the questionnaire was transferred to the electronic survey system E-Lomake.

The research questions

The research was designed to answer one main question: Are the smallest enterprises in Satakunta prepared enough for the ongoing digitization and digitalization.

Interviews

Since we had in earlier research found out, that it is almost impossible to have enough answer by just sending the link e.g., via e-mail, and asking receiver to complete the questionnaire, the survey was conducted by interviews, mostly during the telephone conversations, but in some cases also face-to-face interviews were used. The interviews were conducted during the November and beginning of December.

The interviewer had the E-lomake application open in his/her computer during the interview, and the answers were input direct to the database without having to do the same work twice. At the same time, he interviewers held a bookkeeping of their own of how many were called and how many actually answered to the questions.

Once again it was learned, that answering the surveys is not on the top in the entrepreneurs' preference list. Out of the randomized sample of 1000 enterprises, which would have been about 10 per cent of the target group, 195 were got contact, and out of these, 79 agreed to answer the questions. Thus, the response rate is 7,9 per cent of the sample and approx. 7,9 per mile of the whole target group.

Parallel with the domestic interviews, an international survey was conducted by sending the link to an English questionnaire to project partners of project KA4HR and asking them to spread the link within their business partners. Only few answers were gained, all of them from Germany. The

original idea to compare Finnish results with the results from other partner countries did not realize.

Reporting

In this report, main findings concerning the situation in Satakunta will be presented, the meaning of them discussed, reliability and validity will be evaluated, and some recommendations will be given concerning the further activities. However, due to the lack of comparative material from other countries, no comparation between countries will be made.

Results

Background questions

The companies, who agreed the interview, represented various branches. The distribution of branches was not exactly like the distribution of all enterprises in Satakunta, but this is quite normal when approaching the smallest enterprises. (Figure 2: The branches of the enterprises. The size of the interviewed enterprises matched well to the size distribution of all enterprises in Satakunta, considering that the target group was just these smallest businesses (

Figure 3Figure 4).

Most of the enterprises who responded the survey have been running for 6 years or more. Enterprises who had been running for 5 years or less were only 10 per cent of respondents. (Figure 5). Unfortunately, the age distribution of all the enterprises is not available. However, this finding is parallel with the history told above. Furthermore, it means that many of the respondents are in a phase where an entrepreneur is on the stepway to retire, and if the successor is not found, the business is close to shut down. This became well clarified when reading the answers of entrepreneurs.

The person responding to the survey were mostly entrepreneurs and / or Managing Directors or CEOs of the enterprises. There were only few cases where the interviewee was either member of the board or member of the staff. (Figure 6). In the questionnaire there was also question concerning the age of entrepreneur and average age of personnel, but there were so many who refused to answer this, that it is not relevant to present these results.

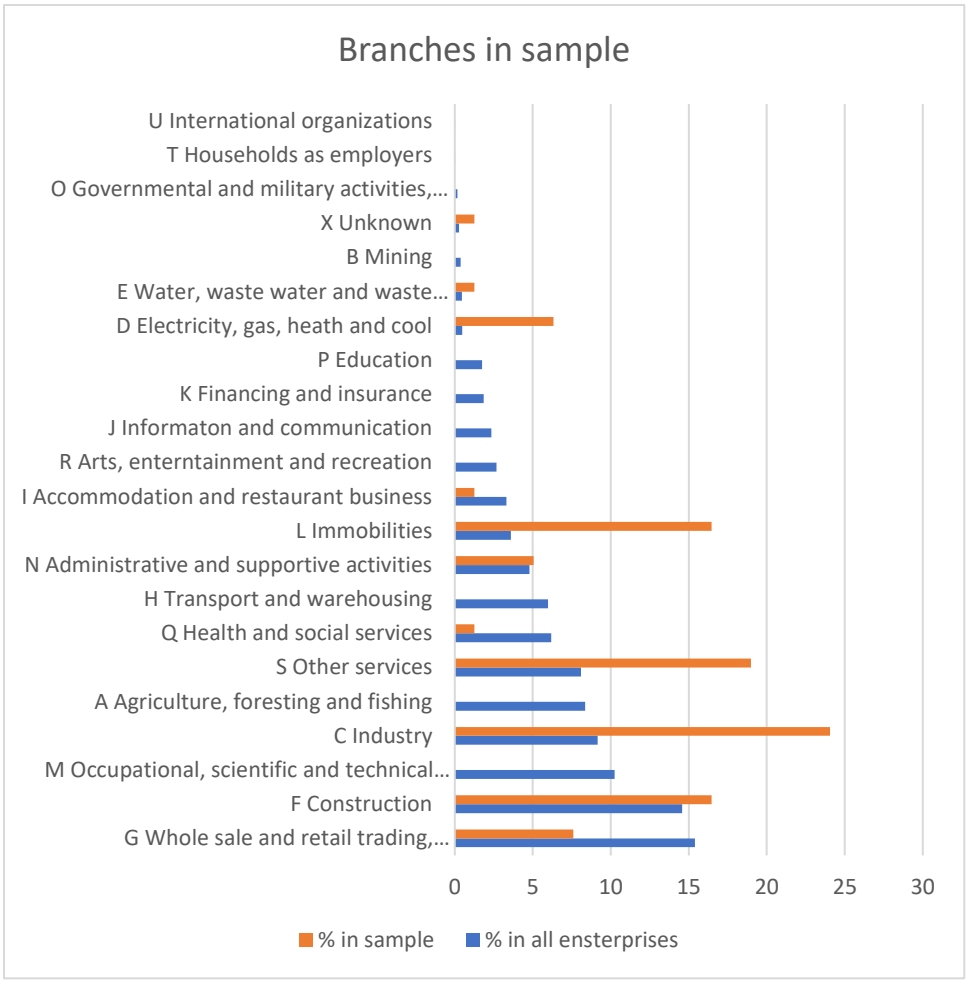

Figure 2: The branches of the enterprises

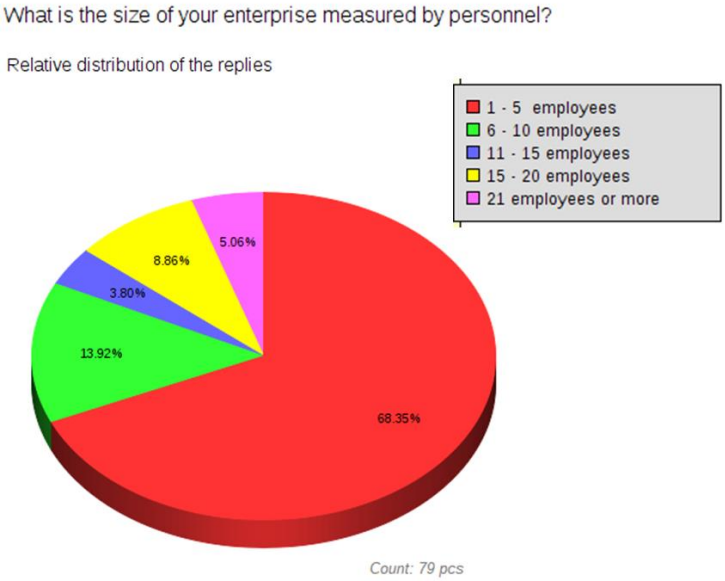

Figure 3: The size of the answered enterprises

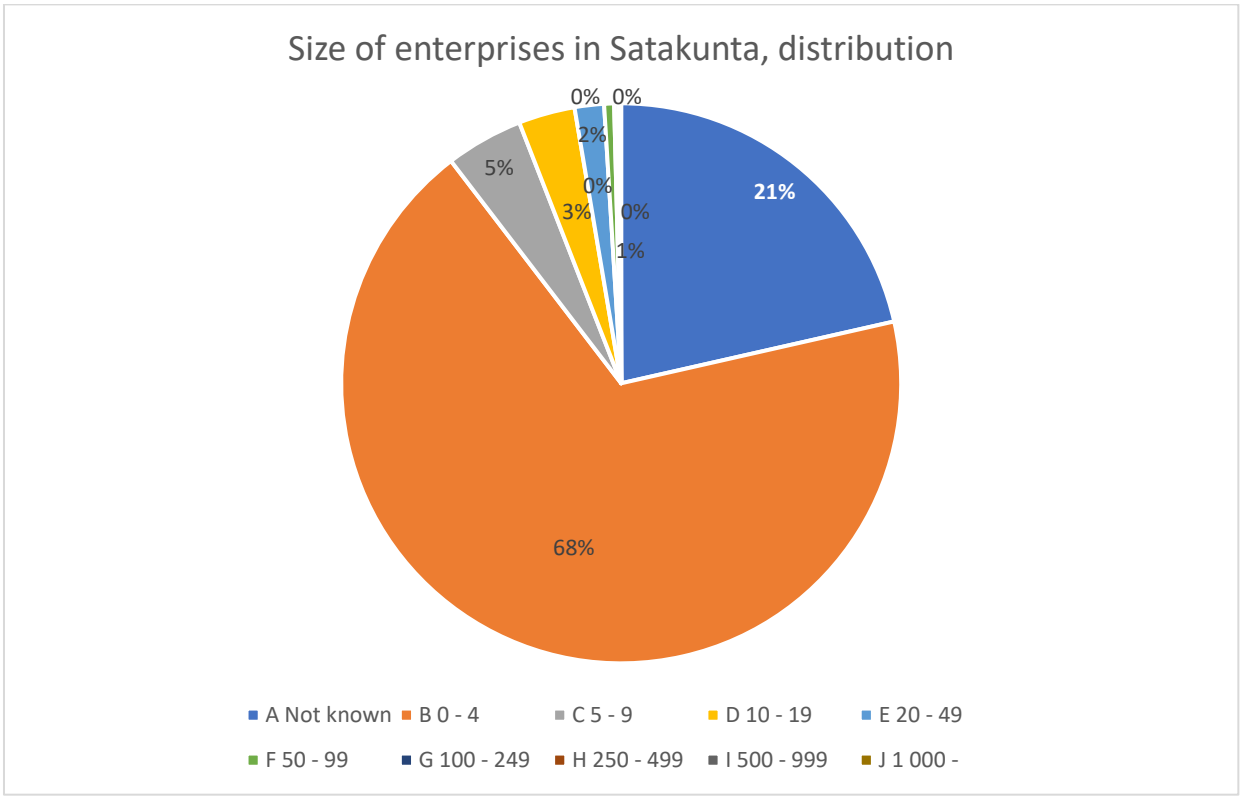

Figure 4: The size of the enterprises in Satakunta

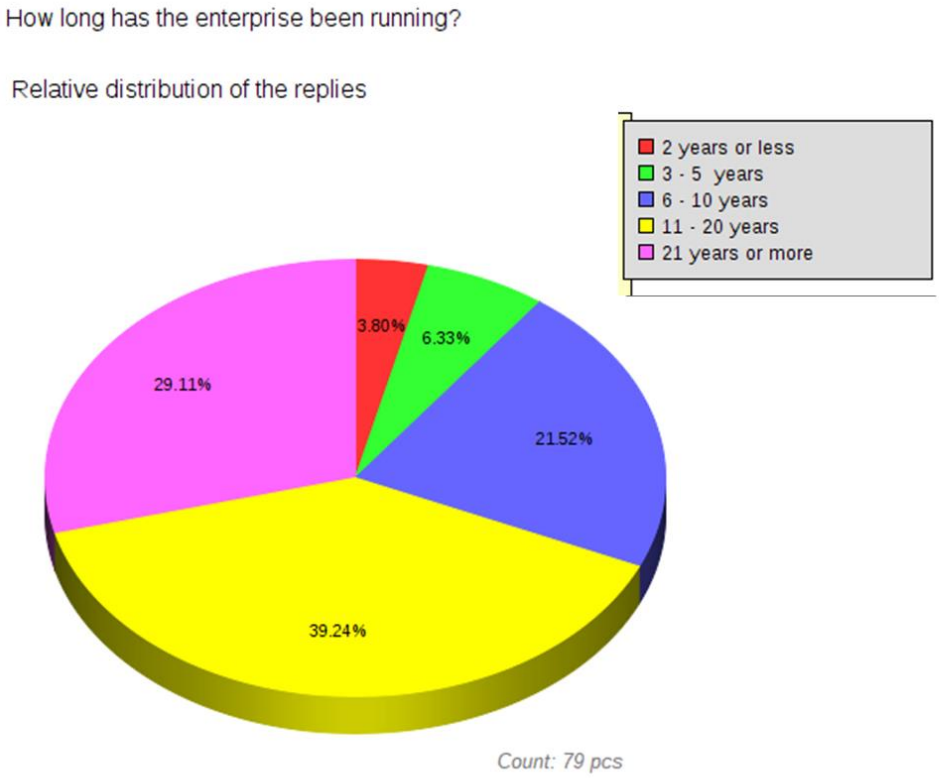

Figure 5: The age of responded enterprises

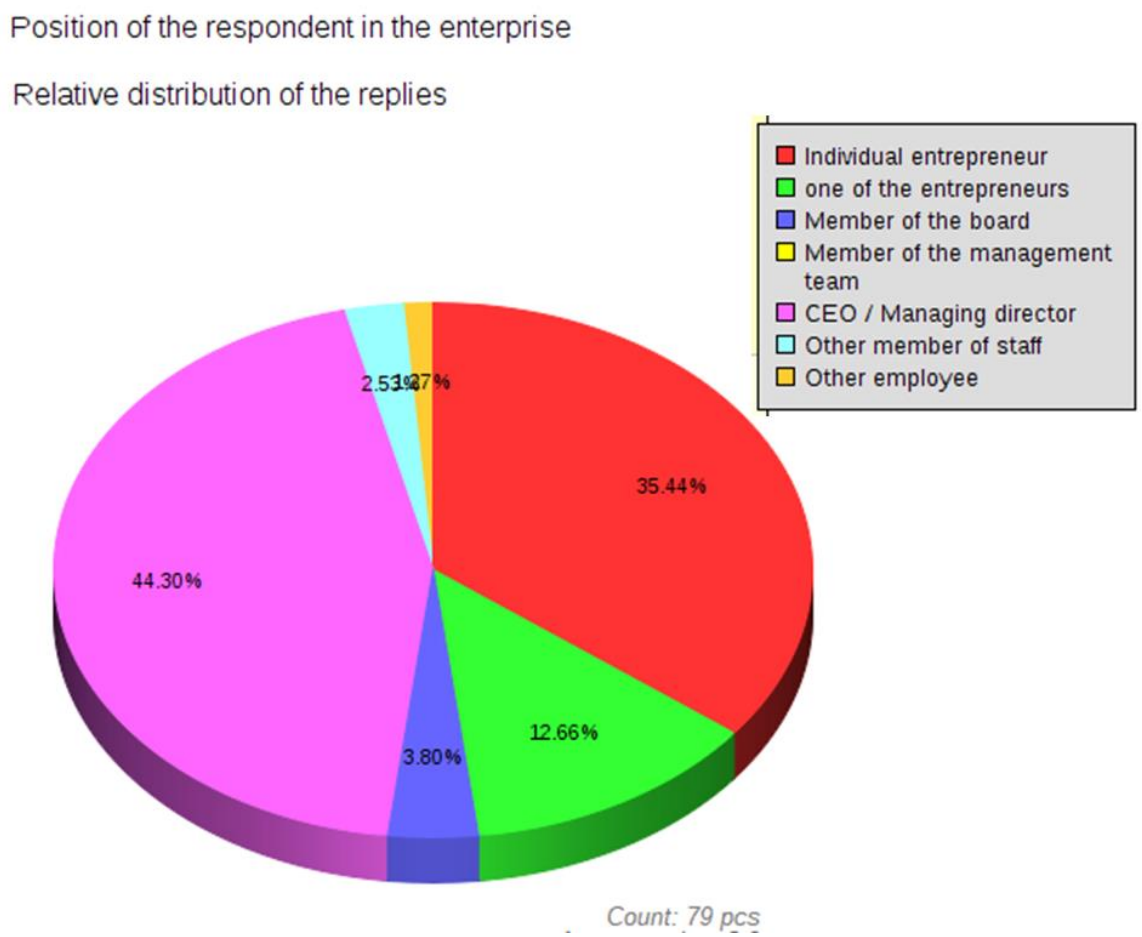

Figure 6: Position of the respondent

The contemporary state in the digitalization

Digitalization can be seen as a strategic topic, as a mean or tool to develop contemporary business or just necessary but not preferred trend of common development. Out of the respondents 25 per cent had involved the digitalization in their strategy or at least discussed the issue while planning the strategy. The topics the discussion had concentrated varied from social media to the needs of branch, requirements of quality and internet of things (IoT). Also E-commercial 2.0 was mentioned in some replies. However, 38 per cent of respondents had not discussed the issue, and 37 percent did not have any strategy at all. (Figure 7).

The usage of digitalization can be divided into three parts. The usage of hardware, the usage of software and the usage of services. Out of equipment (Hardware) the most common tools were computer, mobile tools, and printers. The top three of the applications (Software) was built by Invoicing, bookkeeping and MS Office applications. The most popular services were home pages, Facebook, and E-mail. Also banking services was close to the top. (Figure 8).

To be able to be motivated to implement, learn, and use new tools, an entrepreneur must see concrete benefits gained from the innovations. The respondents were asked, what kind of benefits had they experienced they had gained from the new technology. The number one in the answers was saving time, the second was that new technology makes it easier to do things (What things, was not clarified) and the third issue was the improved communication between customers, suppliers, and other collaboration partners. (Figure 9).

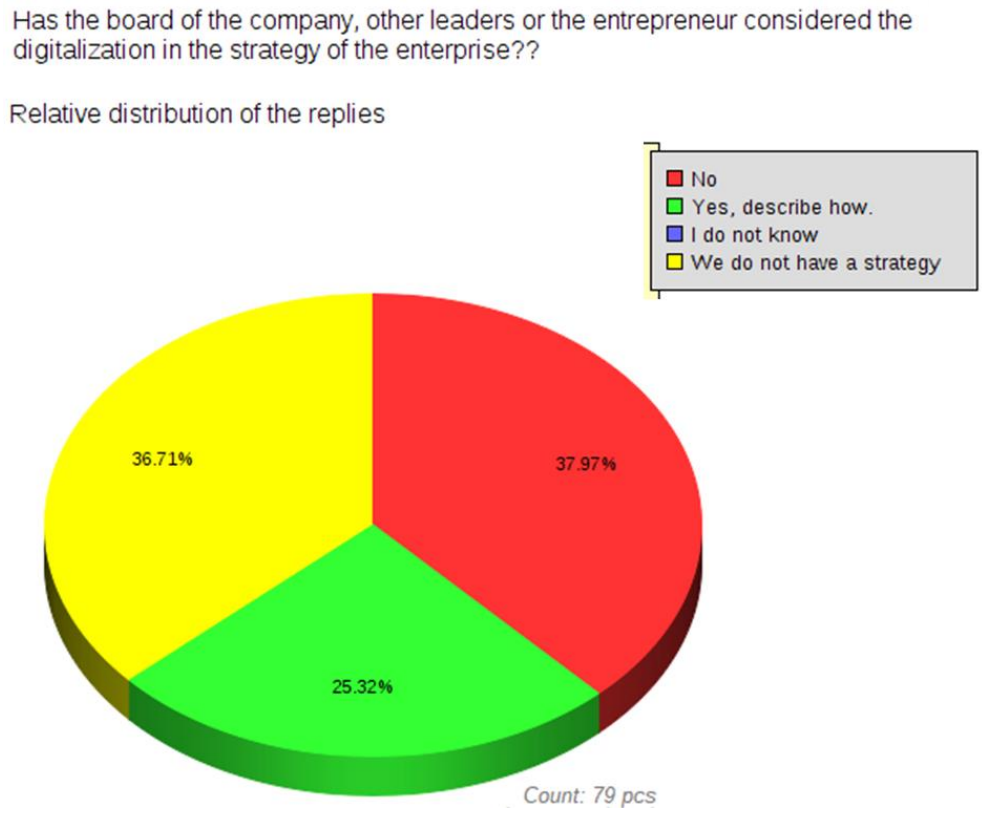

Figure 7: The digitalization and strategy

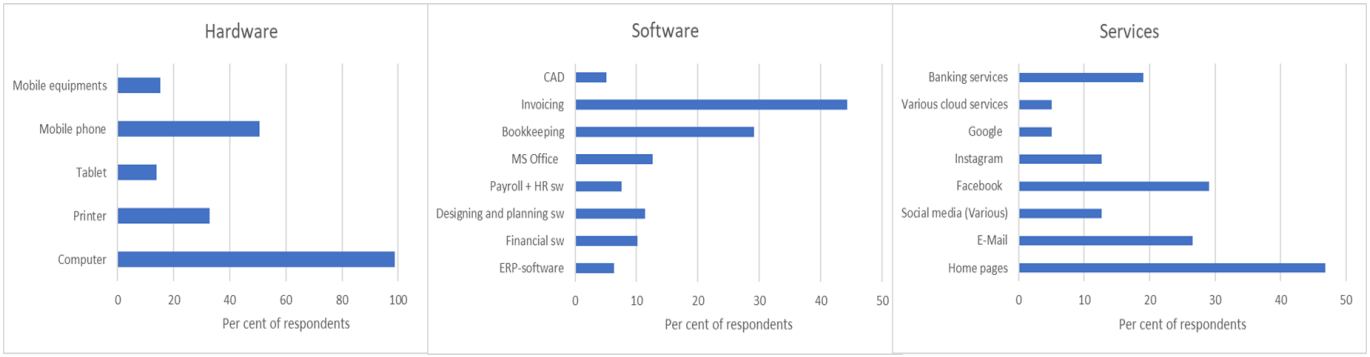

Figure 8: Used digital tools

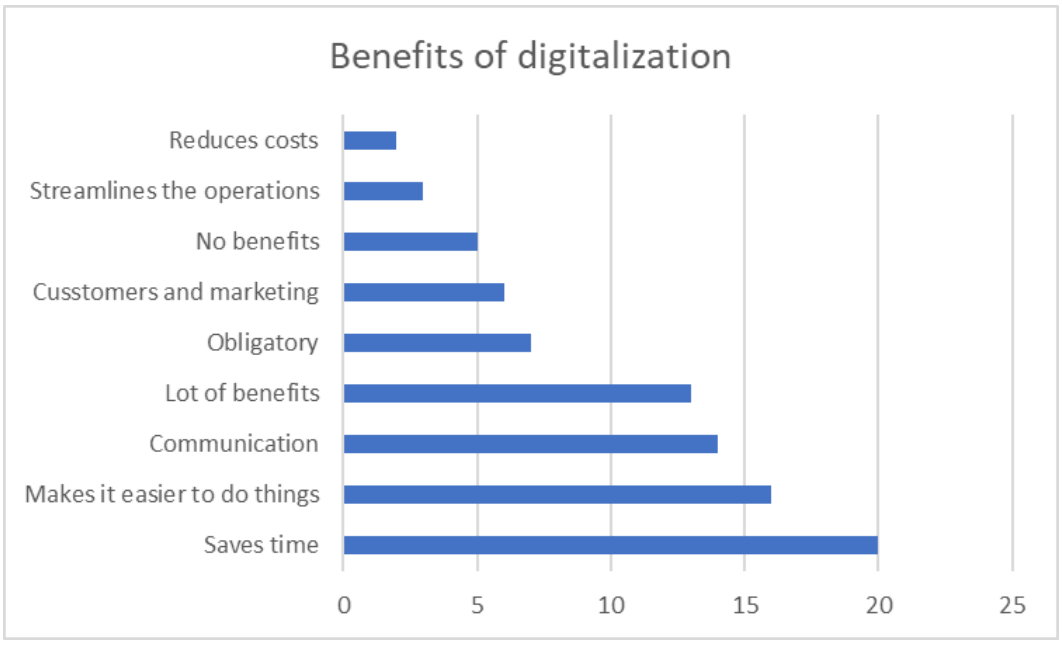

Figure 9: Experienced benefits of digitalization

The digitalization in the budget

Budgeting is one of the ways how an enterprise is planning its future. In common, the strategic planning covers the next 3, 5 or – in rare cases – 10 years period, whereas the budget commonly covers next year or next 12 months. Another difference between the strategic planning and budget is that strategic planning is more qualitative, including goals and descriptions on how the things will be in the future, whereas the budget concentrates on monetary issues: incomes, costs, debts, and assets. The way how the digitalization is considered in the budget, describes, not only it's place in the strategic planning, but also how the enterprise and entrepreneur are seeing the importance of digitalization within the next year.

In 63 percent of the companies, there was no budget as all, which, unfortunately, is quite normal in smallest companies: The budget is made only if someone (e.g., financing institute) requires. 14 percent included the ICT-costs into normal budget, without specifying them, and 11 percent specified the costs caused by digitalization inside the normal budget. 4 percent of the respondents had a particular ICT-budget, and 7,5 percent budgeted the ICT-issues in some other way, but the further question "what, how" remained unanswered. (Figure 10).

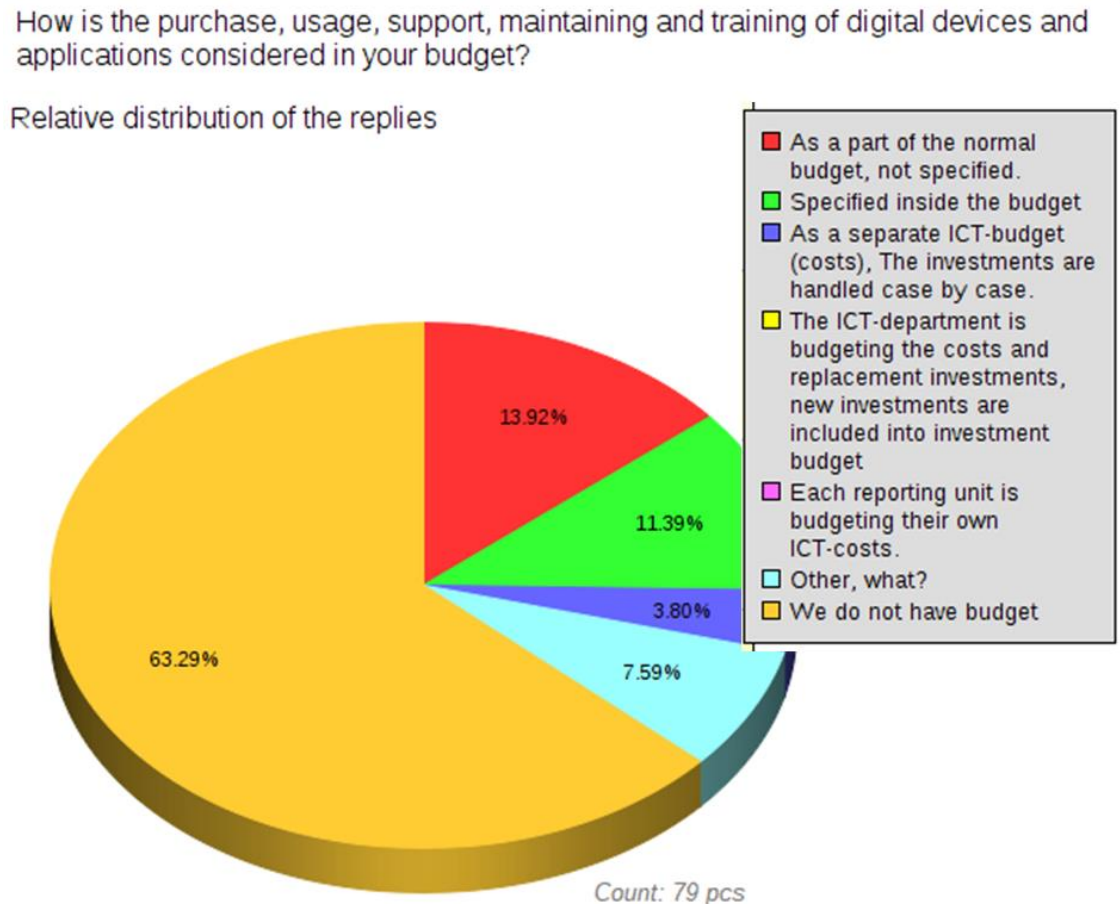

Figure 10: Budgeting the digitalization

Existing knowledge in the enterprises

The enterprises showed a strong trust to their capabilities: 63 per cent of respondents thought that personnel has the knowledge needed to implement and use the digital tools (Figure 11), and 71 per cent of respondents believed, that knowledge and needs match each other (Figure 12). However, in both topics there were 33 per cent of respondents saying that the personnel have not at all or partly enough knowledge, and 30 per cent of respondents saying that the knowledge does not match to the needs or that it match only partially.

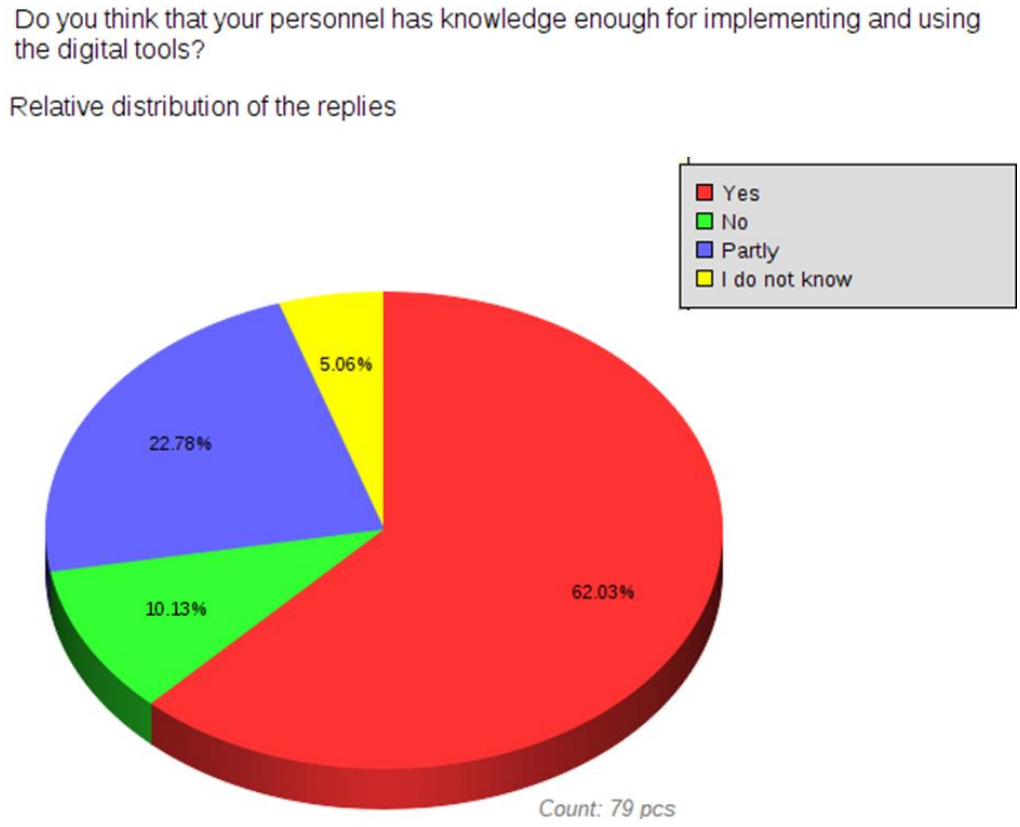

Figure 11: Enough knowledge?

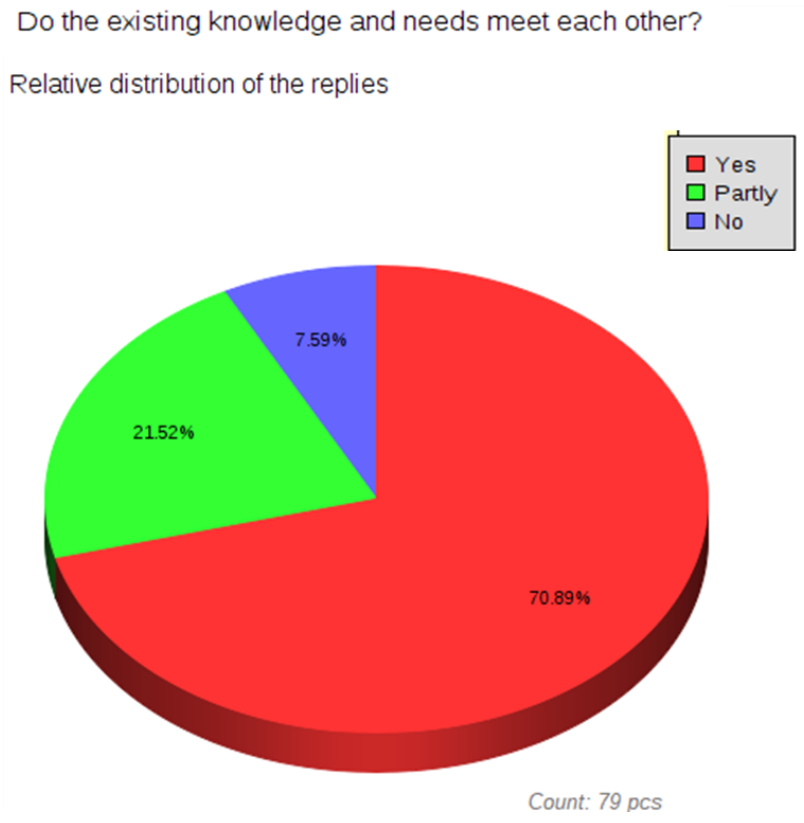

Figure 12: Knowledge vs needs

The logic continuum for this finding is to ask, that in which topics do you have lack of knowledge, how, and by whom you have gained the knowledge and support, and how would you like to gain it in the future. According to the answers, most lack of knowledge were experienced in topics concerning the concepts (e.g., AI, BI, Analytics, etc.), the opportunities of new technologies, legislation, regulation and instructions, and programs and applications (Figure 13).

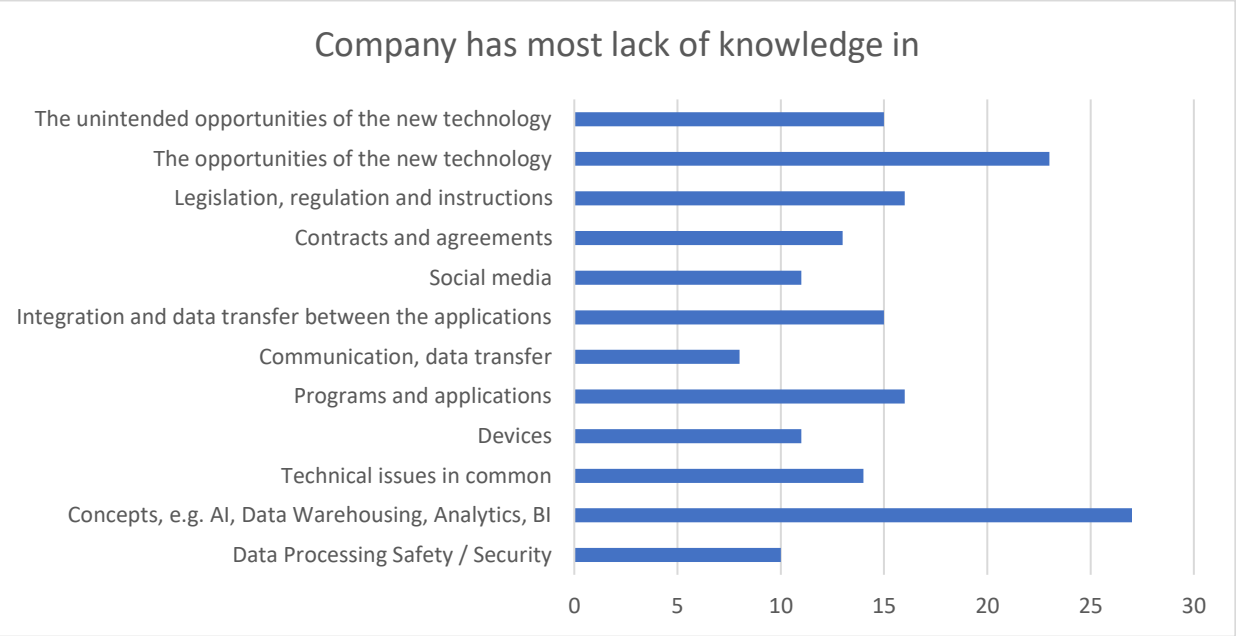

Figure 13: Most lack of knowledge

There were also many other issues that gathered five or more mentions, and many enterprises had chosen more than one topic. The working with new technology is always challenging, particularly, if there exists a lack of knowledge. However, when asking "what kind of challenges you have met" roughly one third of the respondents answered, that they have had no problems. The biggest challenges were time available, missing IT-skills, weak communications, and problems with software (Figure 14

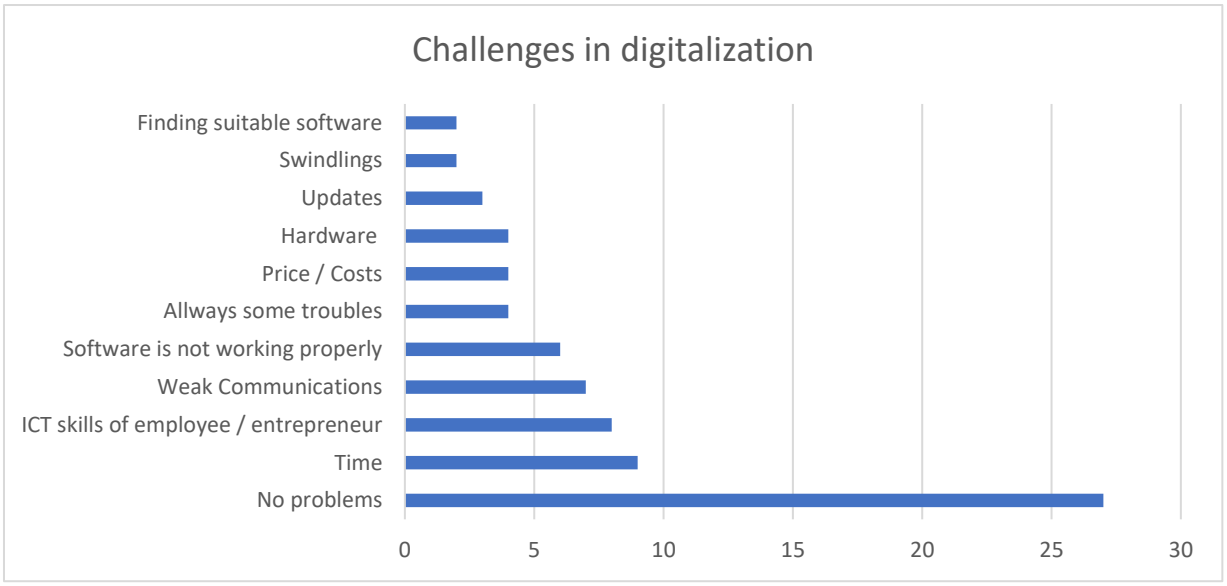

Figure 14: Challenges met

To get the things going, the enterprises had already got support or expected that they could get support mainly from commercial actors, like consults, program suppliers and service providores. The other institutional alternatives gained much less votes (Figure 15). However, when the question was formulated in other way "From whom would you wish to get the support and in what topics". the answers were different. 23 per cent of the respondents did not know who could support and in which topics, 18 per cent of respondents said they do not need support, and 16 per cent did not answer anything. Three most popular sources of support were suppliers, training institutes, and ICT-support, which, according to answers should be dedicated to SME-business (Figure 16, Figure 17).

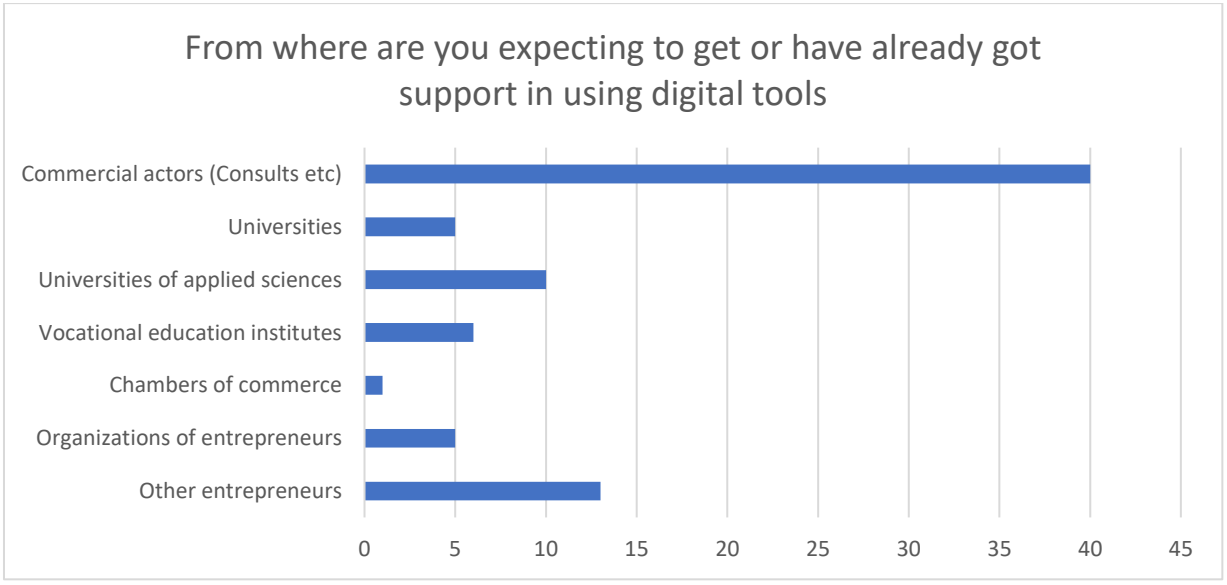

Figure 15: Who would support

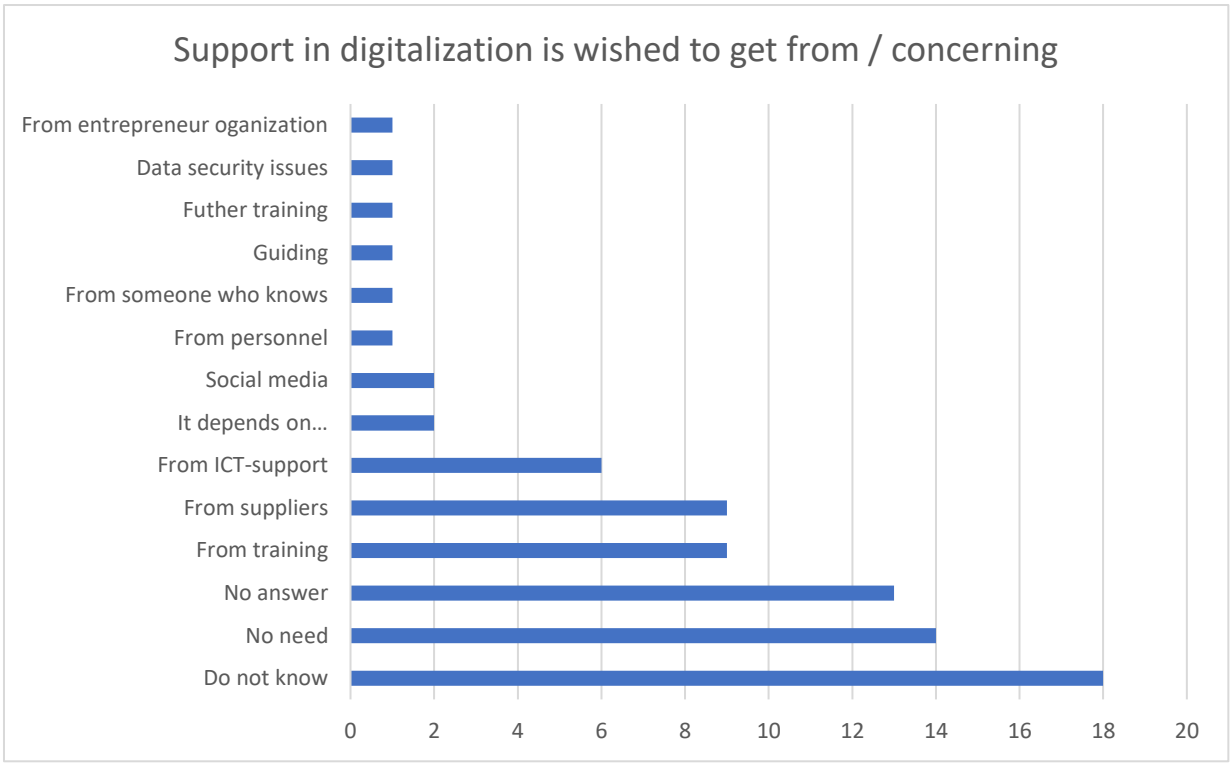

Figure 16: Wished support

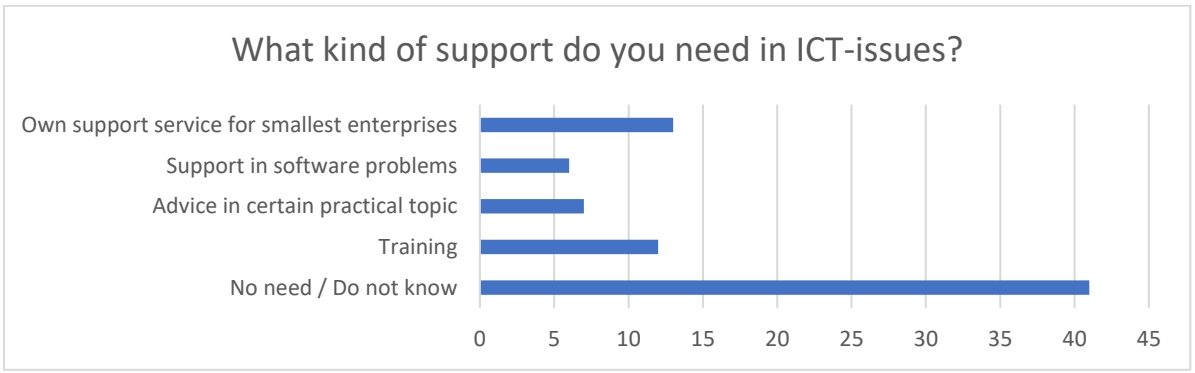

Figure 17: Support needed

The future development

Concerning the future development in the companies, the three most important issues are the role of digitalization in business development, the style of management in the company, and who is the decision maker in digital issues. According to the replies, majority (38 per cent) of the respondents found the digitalization giving opportunities to new forms of operations. However, almost as big part of the respondents considered the digitalization just a tool. 14 per cent of enterprises wished the digitalization give opportunities to completely new businesses and 12 per cent took the digitalization as end in itself or just a media (Figure 18).

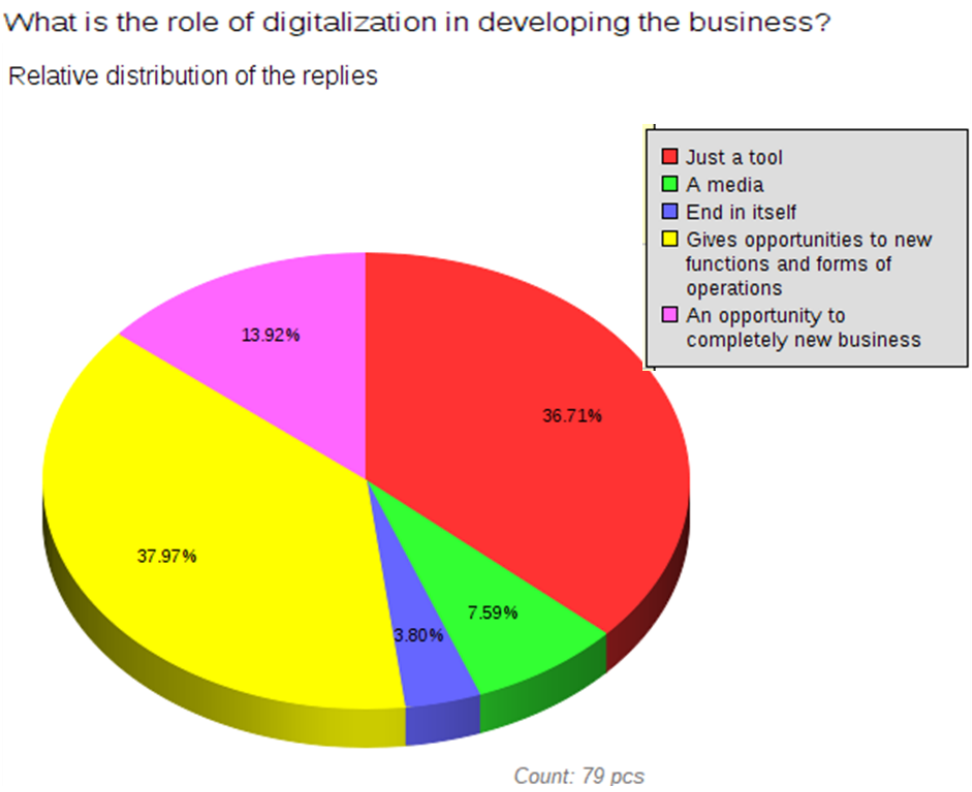

Figure 18: The role of digitalization

One of the most difficult questions for respondents was the question concerning the decision making in the enterprise. 50 of 79 respondents told, that the decisions are made after discussions, one told that he delegates the issues, and the other alternatives, describing more conservative ways to make decisions, gained 19 votes. 9 respondents passed the question without answering (Figure 19). Knowing the Finnish

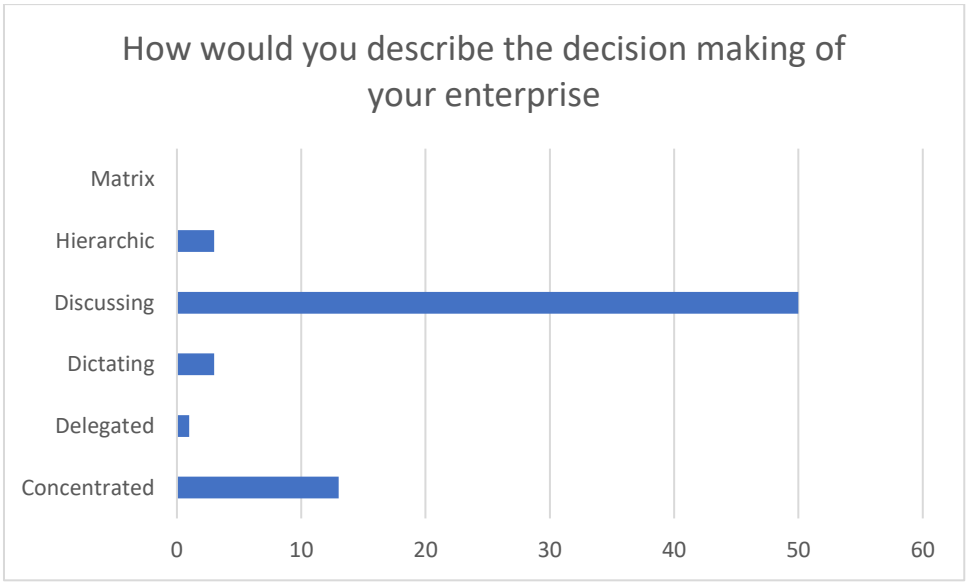

Figure 19: Style of decision making

owners of small enterprises, this result was not expected, and compared to the following question, who is making the decisions concerning the digitalization, the result seems even more unexpected. The decisions concerning the digitalization are in very great degree concentrated to the top of the hierarchy, owner, managing director or Board of Directors (Figure 20).

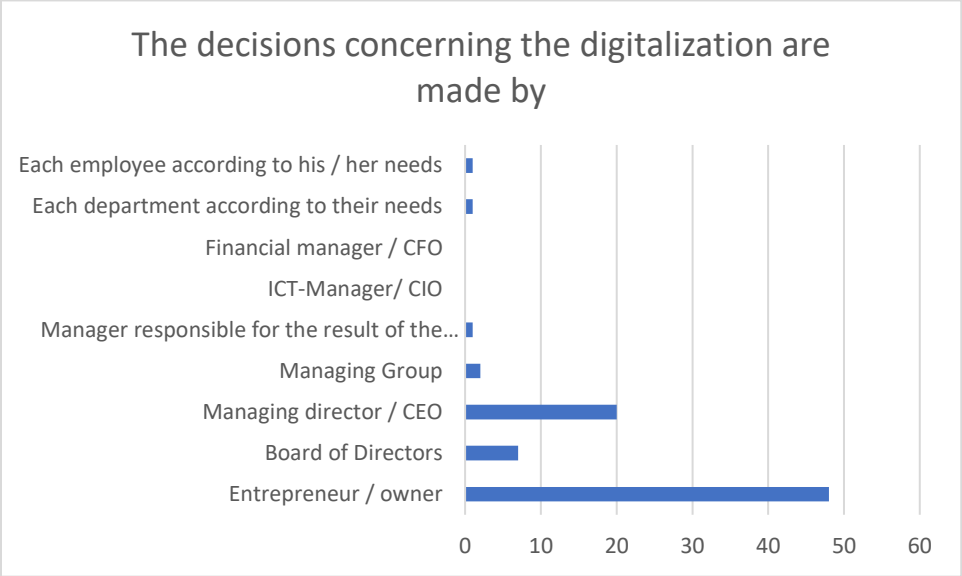

Figure 20: The decisions concerning the digitalization

The enterprises aim to develop their businesses in very different ways. Within the two years period, majority of companies will concentrate on their profitability, on growing in the contemporary market areas and on developing new products. However, there was also big part of respondents who informed that no changes will be made. The main goals withing the 5 years period were to grow in contemporary market area, to find new market areas, and to improve the profitability both by streamlining the operations, by increasing the value of the products and by increasing the volume. There were only few entrepreneurs who had a vision up to ten years period, and among them "no changes will be made" was the winner, but close to it were developing new business concepts, searching new market areas and growing in contemporary market areas (Figure 21)

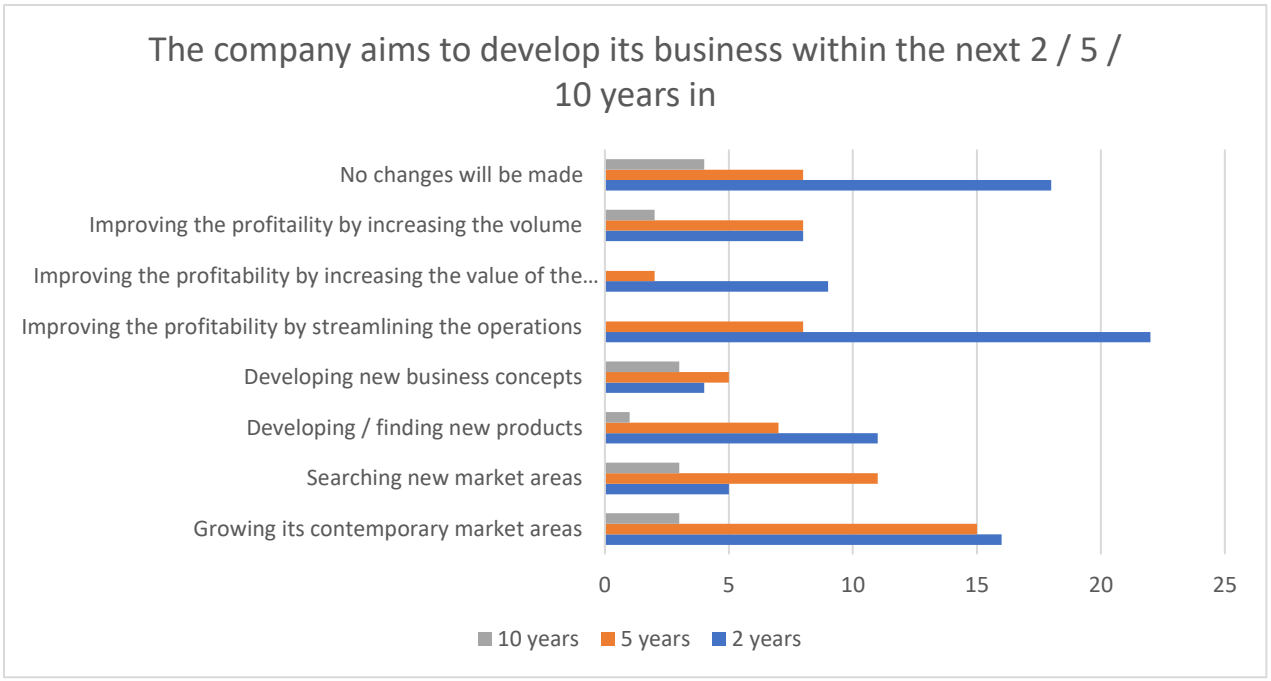

Figure 21: Developing the business within 2/5/10 years period

The future goals of the enterprises in the area of digitalization are parallel to their visions concerning the business development within the next years. Big part of the respondents (36) had no goals, or they did not know any goals. Among the named goals, streamlining of the business, up-to-dateness, and supporting the growth were most named, but single votes were given also to issues like support of the quality, paperless business, and support for decision making, some examples to be given. (Figure 22).

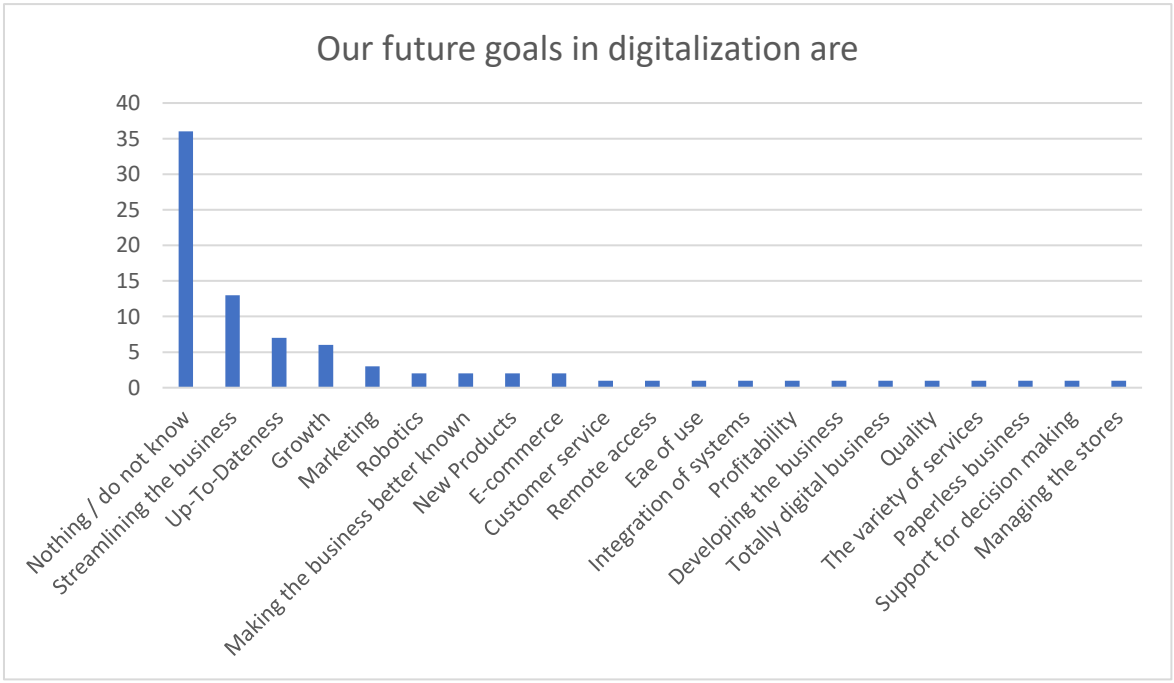

Figure 22: Goals in digitalization

Conclusions

The main research question was "Are the smallest enterprises in Satakunta prepared enough for the ongoing digitalization". According to the results, the situation seems to be divided. Part of the enterprises are well prepared, part of the enterprises are not prepared at all, and in some of the last named, the entrepreneur is just waiting for the retiring. However, there is also a big group of companies between the two poles, wishing and needing more education and training to improve their digital skills, but without knowing that to whom they should approach for help. Also the lack of time and the fear of costs are examples of the challenges on their way to improve their digital skills.

The results gained were in line with the hypothesis and answered to the research question. However, the final sample (those interviewed) was relatively small, thus, the generalizability of the research might be limited. The interviews were conducted by three interviewers, and the results gained by each of them are in line with each other. Thus, the probability of bias caused by interviewer is small. However, some kind of bias may be caused by the text of questions. The interviewers were prepared to explain the question if someone did not understand it, but has everyone dared to ask for explanation, and has the explanation been clear enough are issues we do not know.

It is recommended, that the possibility to offer on-line training of digital skills to the smallest companies will be considered seriously. Online training will on its part solve the problem of lack of time, when an entrepreneur has an opportunity to participate the training whenever he /she has time and choose just those issues that are needed at that moment. However, the question concerning the funding of the training remains still open.