

## Output 05

# Train the Trainer Program Customer-Centric Innovations



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## Language

English

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## I. Project Summary and Introduction

On average, SMEs are less innovative than large companies, as they have limitations due to more limited internal resources (EC, 2019a). Especially in Eastern European countries, SMEs have very low innovation activity and there are large differences between SMEs and large companies. In the field of customer innovation, SMEs find it particularly difficult to innovate. Meeting real customer needs is the core factor for successful innovation management, for generating customer-oriented business ideas and innovative concepts (von Hippel, 2005).

SMEs do not have the time and resources to receive feedback and ideas from their customers. And when they do find the time, it is difficult to process the information and turn it into valuable solutions. A holistic approach to customer-centric innovation is complex and requires changes at all levels of a company. However, digitization and new media are now opening up far-reaching opportunities to make full use of customer-centric innovations in SMEs as well, thus strongly promoting innovative strength and competitiveness (Robra-Bissantz, 2017). These technologies and the opportunities they offer have so far been little known in SMEs and are only used by very few SMEs. They lack information, experience, knowledge and skills on instruments, methods and procedures as well as on the use of digital technologies to acquire, process and realize customer innovations.

Against this background, the project pursues on a broad regional basis the objective of enabling and supporting SMEs to exploit their customer innovation potential and thus to strengthen the productivity and competitiveness of SMEs, to secure existing jobs and to create new ones. The following main activities will be carried out to achieve the objectives.

a) In 13 countries, analysis and comprehensive investigation of best practices on how SMEs generate, process and realize customer-centric innovation approaches and which digital technologies they can use doing so. The best practices obtained will be processed, transferred to SMEs in the context of training and consulting, and supported in their implementation in the companies.

b) Development of a toolbox with instruments, methods and procedures for the realization of customer innovations in SMEs.

c) Through the development of two specific training and coaching programs, SMEs gain digital skills and are enabled to continuously realize comprehensive customer-centric innovations. The learning takes place mainly at the workplace and at the same time includes individual company development projects, so that digital technologies are already used and corresponding innovations are realized during the further training.

d) Comprehensive qualification of teachers and consultants of SMEs.

The qualification, consulting and support programs are carried out by chambers, which, as central SME supporters, have direct access to SMEs and, with their training and technology centers, also have corresponding capacities. However, many teachers and consultants lack the knowledge and skills to qualify and advise SMEs and their staff in the application of digital technologies and in the acquisition, processing and realization of customer innovations at a high-quality level. Therefore, two specific train the trainer programs for teachers and consultants are being developed, which will be implemented and permanently run by 18 colleges and universities from 9 countries.

These programs are:

a) strengthening and promoting the knowledge and skills of teachers and consultants on digital technologies on the one hand and on the realization of customer-centric innovations on the other hand.

b) constantly providing well qualified teachers and consultants on a broad regional basis.

The developed instruments, digital models, educational and support programs will be tested and evaluated under different national conditions in several countries and implemented by all project partners. A continuation of the work after the end of the project with an ongoing implementation of the educational and support programs is secured, including financing.

The project is carried out by eight experienced partners (chambers, other institutions of vocational training and universities) from Denmark, Germany, Poland and Hungary with different levels of development and conditions. The transnational project approach enables learning from each other, identification and transfer of best practices and joint development work.

All results of the project will be transferred to 70 chambers, SME associations and colleges/universities from 13 countries, which will receive implementation advice and will be involved in the project work as associated partners from the beginning of the project.

The following activities were carried out to produce Result 05 Train the Trainer Program Customer-Centric Innovations.

1. Development, consultation and coordination of a curriculum
2. Development of teaching materials and presentations
3. Development, consultation and coordination of an evaluation concept
4. Practical testing of the training with project staff, trainer and SME consultant
5. Evaluation of the practical testing and preparation of an evaluation report
6. Revision and finalization of the curriculum based on the evaluation results

The following results are listed below:

- Chapter II: Complete curriculum of the Train the Trainer program
- Chapter III: Implementation report of the practical test
- Chapter IV: Evaluation concept
- Chapter V: Evaluation report

The extensive teaching materials and presentations are listed in Chapter III and can be found on the project website <https://ci-smes.eu/>.



# Work Package 6

## Train the Trainer Program B

### Customer-Centric Innovations

#### II. Concept and Curriculum

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## Introduction – about the project “ICIinSMEs”

This Training program is developed within the framework of the EU Program *Erasmus + Key Action 2: Cooperation for innovation and the exchange of Good Practices* funded project **"Digital methods, toolbox and training for increasing customer innovation in SMEs"**. (ICIinSMEs, Project NO 2020-1-DE02-KA202-007397).

The project aims to strengthen the innovation capacity of SMEs in Eastern Europe. In the frame of the project, two training programs for SMEs are developed, one focusing on the application of digital skills and technologies and the other on customer-centric innovation. Through the development of two specific training and coaching programs, SMEs gain digital skills and are enabled to continuously realise comprehensive customer-centric innovations.

These programs are organised by chambers and their training and technology centres, which have direct access to SMEs. To teacher and consultants qualify and advise SMEs at a high-quality level in the application of digital technologies and the acquisition, processing and realisation of customer innovations, two trains the trainer programs for teachers and consultants are developed to help trainers master the curriculum using modern teaching methods. The goal of these programs is a comprehensive qualification for teachers and consultants for SMEs.

## Concept and Curriculum of the Train the Trainer Program B

As a starting point for this curriculum, it is worth describing what we exactly mean by Customer-centric innovation. “Customer-centric innovation describes a change from innovating for customers to innovating with customers. Therefore, the customer takes an active role in innovation processes and becomes the primary source of ideas to initiate innovation activities. By integrating the customer-centric innovation philosophy, companies open their research and development activities, meaning that the innovation process happens with input from inside and outside of the company. Customers are involved in all stages of the innovation process.” (Desouza et al. 2020; Steinhoff & Breuer, 2014; Zajkowska, 2017) The curriculum of the Train the Trainer Program B focusing on Customer-Centric Innovation is based on the results and experiences of the project, supplemented with modern teaching methods and case solutions. The project results are as follows: An empirical study was conducted among SMEs which, on the one hand, underpinned the legitimacy of the planned training courses and, on the other hand, incorporated the experience gained by them into the curriculum of the training courses. The first part of the empirical research consisted of a questionnaire survey in which the awareness and diffusion of customer-centric innovations in SMEs, as well as the use of digital solutions that support their implementation, were measured. In addition to the questionnaire survey best practices were collected and investigated, on how SMEs generate, process and realise customer-centric innovation approaches and which digital technologies they can use doing so. A toolbox with instruments, methods and procedures for the realisation of customer innovations in SMEs was also developed. The teaching material of the training programme for SMEs “Realisation of customer-centred innovations” is also built into the TTP-B. Best practices from training institutions serve with a useful contribution to the concept and material design.

**The Train the Trainer program includes the following elements.**

- Presentation, consulting and mediation aspects of the content of the SME specific training programme "Realisation of customer-centred innovations
- Presentation, advice and mediation aspects of the tools, methods of the toolbox
- Presentation, consulting and training of the coaching process
- Pedagogical issues

### **Teaching methods**

The training programme consists of a combination of presentations, consultations and discussions in plenary, work in small groups and role-plays, case studies, and examples.

### **Teaching materials**

PPT presentations, case studies, examples, best practices, question guides, checklists

### **Objectives, Target Groups and Duration of the training**

This Training is a three-day train the trainer program for teachers and consultants of SMEs, who receive knowledge, skills, and pedagogy which enable them to

- qualify and advise employees of SMEs about the acquisition, processing and implementation of customer innovations, including all areas, possibilities and instruments and so on (independent of the use of digital technologies),
- transfer a toolbox of instruments, and methods to SMEs and provide sound advice on implementation.

### **The Train the Trainer Program aims**

- strengthening and promoting the knowledge and skills of teachers and consultants on the realisation of customer-centric innovations,
- providing them with modern teaching methodologies.

### **Target Groups**

The target group of the program is lecturers and consultants of SMEs from (or delegated by) chambers or other institutions.

The Train the Trainer program does not include a final examination, the participants receive a qualified certificate of participation.

### **Duration of the training**

Three days of training, from 09:00-17:00 all-day

### **Programme and content**

Module 1: Welcome and ice breaker activity

- Greetings
- Objectives and execution of the training - Introduction to Train-the-Trainer Program
- Self-presentation of the participants

- Determination of the participants' previous knowledge

Module 2: Innovation in general

Module 3: Customer-centric innovation. Customer-centric innovation in SMEs - Experiences of a survey and best practices.

- What is customer-centric innovation?
- Benefits and barriers for companies
- How to involve customers in product innovation?
- Methods and digital tools supporting customer-centric innovation. Tools for customer-feedback collection

Module 4: Quality Function Deployment (QFD) and House of Quality (HOQ)

Module 5: Modern teaching methods, Effective Teaching and Training Techniques

Module 6: Digital tools for teaching and learning

Module 7.: Project task on topic Customer-centric innovation

## Schedule

### Program for the Train-the-Trainer Program B on “Customer-Centric Innovations” 3 days training

<b>1st Day –Innovation and Customer-centric innovation</b>	
09:00 – 09:30	Module 1 - Welcome and ice breaker activity, Introduction to Train-the-Trainer Program, self-presentation of the participants
09:30 – 10:30	Module 2 – Innovation in general
<b>10:30 – 11:00</b>	<b>Coffee break</b>
11:00 – 12:30	Module 3 – What is Customer-centric innovation? Benefits and barriers.
<b>12:30 – 13:30</b>	<b>Lunch</b>
13:30 – 15:00	Module 3 – How to involve customers in product innovation? Methods and digital tools supporting customer-centric innovation. Tools for customer-feedback collection
<b>15:00 – 15:30</b>	<b>Coffee break</b>
15:30 – 17:00	Module 3 – Customer-centric innovation in SMEs - Experiences of a survey and best practices.
	<b>Dinner and exchange of experience (optional)</b>

<b>2nd Day – Modern teaching methodology</b>	
09:00 – 09:30	Welcome day 2
09:30 – 10:30	Module 4 – Quality Function Deployment (QFD) and House of Quality (HOQ)
<b>10:30 – 11:00</b>	<b>Coffee break</b>
11:00 – 12:30	Module 4 – Interactive case study solution for QFD and HOQ
<b>12:30 – 13:30</b>	<b>Lunch</b>
13:30 – 15:00	Module 5 – Modern Teaching Methods

<b>15:00 – 15:30</b>	<b>Coffee break</b>
15:30 – 17:00	Module 6 – Digital tools for teaching and learning
	<b>Dinner and exchange of experience (optional)</b>

<b>3rd Day – Project task</b>	
09:00 – 09:30	Welcome day 3
09:30 – 10:30	Module 7 – Introduction to the Project task on topic Customer-centric innovation
<b>10:30 – 11:00</b>	<b>Coffee break</b>
11:00 – 12:30	Module 7 – Independent work, or working in groups
<b>12:30 – 13:30</b>	<b>Lunch</b>
13:30 – 15:00	Module 7 – Presentation of participants or groups
<b>15:00 – 15:30</b>	<b>Coffee break</b>
15:30 – 17:00	Summary and conclusion of the Train-the-Trainer

Main Sources:

- Monika Zajkowska, Melanie Mesloh: Study of applied instruments, methods and procedures for the integration of customer-based innovation in SMEs, 2021
- Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics, Erika Szilágyiné Fülöp, Ádám Bereczk: Customer-centric Innovation in SMEs. Results of an Empirical Research, 2021
- Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics, Erika Szilágyiné Fülöp, Ádám Bereczk: Experiences of Best Practices in the use of digital technologies supporting customer innovations by SMEs, 2021

## **Module 1: Welcome and ice breaker activity**

- Greetings
- Objectives and execution of the training - Introduction to Train-the-Trainer Program
- Self-presentation of the participants
- Determination of the participants' previous knowledge

## Module 2: Innovation in general

Regarding innovation, many people still associate to the Austrian economist Schumpeter’s definition, accordingly innovation always means something new. He also defined the five basic cases of business innovation (Schumpeter, 1939), that are the followings:

- 
- The introduction of a new product in industry,
  - the introduction of a new production process/method,
  - the discovery of a new market,
  - the discovery of a new resource in the input market,
  - the creation of a new organisation.
- 

Business economists have attached great importance to the study of the implementation of business innovation. Drucker (1985) is a prominent representative of management science who argues that ‘innovation is the change in the value of the profit to be derived from (resources) and thus the better satisfaction of consumer needs.’ (Drucker, 1985, pp. 42) He approaches the subject from a management rather than a technical point of view. In his view, business innovation is required when there are differences in processes. Drucker (2002) identifies the following sources of innovation: ‘unexpected events, inconsistencies, process requirements, and industry and market changes. These characteristics are within the company. But there are also external factors such as demographic changes, changing perceptions, and new knowledge.

According to Oslo Manual (2018, pp.68.) ‘Innovation activities include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm. A business innovation is a new or improved product or business process (or combination thereof) that differs significantly from the firm’s previous products or business processes and that has been introduced on the market or brought into use by the firm.’ (Oslo Manual, 2018, pp.68.) It differs two types of innovation by object: product and business process innovation. Product innovation means changes in the products of the company, while process innovation refers to changes in company processes (Oslo Manual, 2018, pp.70.). ‘A product innovation is a new or improved good or service that differs significantly from the firm’s previous goods or services and that has been introduced on the market’. (Oslo Manual, 2018, pp.70.) ‘A business process innovation is a new or improved business process for one or more business functions that differs significantly from the firm’s previous business processes and that has been brought into use in the firm.’ (Oslo Manual, 2018, pp.70.)

Nowadays, innovation is one of the most commonly used concepts in technical, scientific and economic life, that spans several disciplines, so there are several approaches and definitions in the literature. Many experts in the fields of business, management and organisation have studied the process of development and continuous innovation that has fundamentally changed our life.

Brown (2008) summarizes business processes into six groups: Production of Goods and Services, Distribution and Logistics, Marketing and Sales, Information and Communication Systems, Administration and Management, Product and Business Process Development. Figure 1 also shows the subcategories.

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Short term	Details and subcategories
1. Production of goods or services	Activities that transform inputs into goods or services, including engineering and related technical testing, analysis and certification activities to support production.
2. Distribution and logistics	This function includes: a) transportation and service delivery b) warehousing c) order processing.
3. Marketing and sales	This function includes: a) marketing methods including advertising (product promotion and placement, packaging of products), direct marketing (telemarketing), exhibitions and fairs, market research and other activities to develop new markets b) pricing strategies and methods c) sales and after-sales activities, including help desks other customer support and customer relationship activities.
4. Information and communication systems	The maintenance and provision of information and communication systems, including: a) hardware and software b) data processing and database c) maintenance and repair d) web-hosting and other computer-related information activities. These functions can be provided in a separate division or in divisions responsible for other functions.
5. Administration and management	This function includes: a) strategic and general business management (cross-functional decision-making), including organising work responsibilities b) corporate governance (legal, planning and public relations) c) accounting, bookkeeping, auditing, payments and other financial or insurance activities d) human resources management (training and education, staff recruitment, workplace organisation, provision of temporary personnel, payroll management, health and medical support) e) procurement f) managing external relationships with suppliers, alliances, etc.
6. Product and business process development	Activities to scope, identify, develop, or adapt products or a firm's business processes. This function can be undertaken in a systematic fashion or on an ad hoc basis, and be conducted within the firm or obtained from external sources. Responsibility for these activities can lie within a separate division or in divisions responsible for other functions, e.g. production of goods or services.

Source: Adapted from Brown (2008), “Business processes and business functions: A new way of looking at employment”, [www.bls.gov/mlr/2008/12/art3full.pdf](http://www.bls.gov/mlr/2008/12/art3full.pdf) and Eurostat (2018), *Glossary of Statistical Terms*, [http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Business\\_functions](http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Business_functions).

Figure 1 Business processes and business functions

Source: Oslo Manual, 2018, pp.73

Accordingly, Solow, there is a link between innovation and economic growth, it means that technological progress can be the engine of long-term development (Solow 1956). It is no coincidence, then, that business innovation has become the focus of economic development policy in recent years. Nowadays, all five basic cases of innovation mentioned by Schumpeter (1939) can be observed in practice. On the one hand, the pandemic slowed the pace of economic development; on the other hand, the resulting deficit prompted economies to develop new products and new production processes. The change can also be observed in the sources of procurement. To reduce dependence on international trade and make production more predictable, countries began to produce themselves the components they had previously imported. A paradigm shift in the make-or-buy dilemma can also be observed. What countries could solve within their own capabilities; they did. Of course, time and production costs will determine how permanent these changes are.

Hansen and Birkinshaw's (2007) innovation value chain approach describe innovation as a process with three phases in a specific order, including idea generation, idea development, and dissemination of the developed ideas.

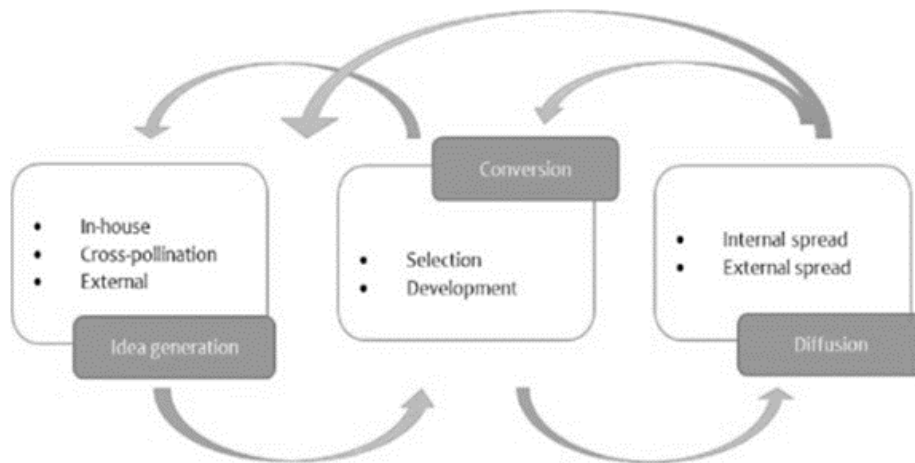


Figure 2 The innovation value chain

Source: Hansen and Birkinshaw, 2007; Kline (1985) and Kline and Rosenberg (1986) in Mvulirwenande and When (2020, pp.141)

According to the model, managers must perform six fundamentally important tasks during the phases, as follows:

1. internal idea generation,
2. cross-functional idea generation,
3. external idea generation,
4. selection of ideas,
5. further development,
6. dissemination within the company.

These are the links in the innovation chain. According to organization4innovation.com (2018), ‘the process is as strong as its weakest link. If you are good at ideation but not so good at development, very few of your brilliant ideas will come to fruition. To be an effective innovator, you need to be good at all stages of the value chain.’

Today, the systems approach has a decisive force in the interpretation of innovation. Kline-Rosenberg's (1986) model was one of the starting points for the development of the systems view of innovation, which emphasizes the importance of interactions and interdependencies among participants in the innovation process.

Innovation is therefore typically an interactive process, and consequently the economic structure (organizations) and the institutional system (regulations, laws, etc.) have a significant impact on the speed and direction of innovation activities. This underscores the importance of the innovation system approach. ‘The innovation system approach is now central to thinking about innovation and, by extension, economic growth, competitiveness, and employment’ (Edquist, 2001, p. 225).

The core of the national innovation system (NIR, NIS) approach is the separation on a territorial basis (Lundvall, 1995, Nelson 1993), and the regional innovation system (RIR, RIS (Mészáros-Csizmadia-Grosz, 2011)). In this approach, we do not focus on a specific industrial or technological sector, but on a well-defined territorial unit, an economy or a region, as the economic-territorial unit to be studied.

According to the OECD interpretation, the national innovation system consists of all market institutions in a country that influence the direction and speed of innovation and technological diffusion (Buzás, 2007). An important feature of the NIR concept is that it emphasizes the close



connection of the innovation process and its actors with other elements of society and the economy, making it clear that it is by no means a process driven by scientific and technical goals and interests.

The firm and innovation are inseparable concepts, but the innovation capacity of firms may differ depending on what has been studied in the work of different researchers. Due to the interest in economic policy, more and more research is directed to the study of innovation needs, innovation capability, innovation performance and the resulting enterprise performance.

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### **Module 3: Customer-centric innovation. Customer-centric innovation in SMEs - Experiences of a survey and best practices.**

- What is customer-centric innovation?
- Benefits and barriers for companies
- How to involve customers in product innovation?
- Methods and digital tools supporting customer-centric innovation.
- Tools for customer-feedback collection

Main Sources:

- Monika Zajkowska, Melanie Mesloh: Study of applied instruments, methods and procedures for the integration of customer-based innovation in SMEs, 2021
- Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics, Erika Szilágyiné Fülöp, Ádám Bereczk: Customer-centric Innovation in SMEs. Results of an Empirical Research, 2021
- Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics, Erika Szilágyiné Fülöp, Ádám Bereczk: Experiences of Best Practices in the use of digital technologies supporting customer innovations by SMEs, 2021

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### **Customer-centric Innovation**

Source:

- Monika Zajkowska, Melanie Mesloh: Study of applied instruments, methods and procedures for the integration of customer-based innovation in SMEs, 2021

In a changing and uncertain world, the alignment of innovation with the current and potential customers' needs is necessary. To meet these challenges and to remain competitive, especially small and medium-sized enterprises (SMEs) must constantly innovate to add value. In other words, they must design, develop and deploy new product and service offerings that meet the needs of the marketplace. In order to do this they must become customer driven (Griffin, 2004; Zahay and Griffin, 2004).

Customer-centric innovation is very different from customer-focused innovation and customer-driven innovation. In customer-centric innovation programs, innovation is done **with customers—organizations and customers create innovation together**. In customer-focused innovation programs, innovation is done by the organization. In customer-driven innovation programs, the customer is the key player – innovation is done by customers, with minimum involvement by the organization. Customers are the primary source of ideas and the customers of new products and services. They can offer ideas without geographic, and time constraints, and the organization must be able to apply those ideas quickly to the development of new products and services. Without the tools to support such dynamic interaction, it risks losing its customer to competitors.

The type of innovation represents the nature of customers’ engagement. In customer-centric innovation programs, the engagement can be described as **“open innovation”** (Zajkowska, 2017); that is, the innovation program is open to customers and they are allowed to be involved with the process, usually at specific points in time with specific processes. In customer-focused innovation programs, customer engagement can be called “closed innovation”; that is, the innovation process is seen as a black box and customers are not directly involved with the innovation process. In customer-driven innovation programs, in contrast, the customer’s engagement is dynamic, providing ideas anytime and anywhere. Customers and organizations interact frequently, sometimes in unstructured ways, and organizations need to serve customers’ dynamic needs.

Table 1/a Customer-centric Innovation compared to other consumer-engaging innovations

	<b>Customer-driven Innovation</b>	<b>Customer-centric Innovation</b>	<b>Customer-focused Innovation</b>
<b>Central entity</b>	Customer	Customer and organization	Organization
<b>Degree of customer involvement</b>	Innovation by customers	Innovation with customers	Innovation for customers
<b>Role of organization</b>	Coordinator	Communicator	Innovator
<b>Type of innovation</b>	Dynamic innovation	Open innovation	Closed innovation
<b>Degree of control</b>	Impossible to control	Difficult to control	Easy to control
<b>Degree of coordination</b>	Emergent coordination	Difficult to coordinate	Easy to coordinate
<b>Critical innovation stage</b>	Commercialization (Ideas are over-generated and developed, but difficult to commercialize)	Idea development (Ideas are abundant, but difficult to develop)	Idea generation (Ideas are scarce)
<b>Types of innovation to focus on</b>	Products and services, output interaction with products and services	Communication with customers; customer interaction with organization	Customer segmentation and customer analysis

<p><b>Critical issues with innovation types</b></p>	<p>“Sticky” and tacit knowledge transfer requires high levels of human interaction Customer must be segmented for proper analysis</p>	<p>Investment in infrastructure  High-quality communication needed Risk of copycats</p>	<p>Analysis must be ongoing  Systems must be integrated  Information overload possible</p>
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Source: K. C. Desouza, Y. Awazu, S. Iha, C. Dombrowski, S. Papagari, P. Baloh, J. Y. Kim, Customer-driven Innovation, Research Technology Management, Taylor & Francis 2008, pp. 35-44.

In customer-centric innovation organizations can control the innovation process, coordination is done by organization and is quite complex, with multiple stakeholders involved. In customer-centric innovation programs, idea development, screening and refinement are central. With reference to the presented analysis and taking into account the objectives of this project, the following definition of Customer-centric innovation was adopted for further analysis in this report:

*“Customer-centric innovation describes a change from innovating for customers to innovate with customers. Therefore, the customer takes an active role in innovation processes and become the primary source of ideas to initiate innovation activities. By integrating the customer-centric innovation philosophy, companies open their research and development activities, meaning that the innovation process happens with input from inside and outside of the company. Customers are involved in all stages of the innovation process.”*

(Desouza et al. 2020; Steinboff & Breuer, 2014; Zajkowska, 2017)

Customer-centric innovation revolves around customers’ needs with the goal of designing a new product or service that delivers on these needs and expectations. Customer-centric New Product Development (CC-NPD) can be defined as a multidisciplinary innovation process that puts customer’s needs and expectations at the heart of the new product development process (Romero and Molina, 2016). Authors’ innovation process puts the customer at the centre of the creative (imagine) development and (early) commercialization stages.

Customer-centric innovation can also be considered from the point of view of the business customer. In this meaning customer-centric innovation is an innovation able to provide a potential and real value for business customers that is not exhausted with the technological potential already incorporated in, but it can still meet the current and future applications of business customers (Martinelli, 2019). This innovation has significant implications for many companies in any sector, even the most traditional ones in SMEs. Customer-centric innovations are unavoidable for technology providers operating in a business environment characterized by unprecedented turbulence, volatility and dynamism (Christopher, 2016). Customer-centric innovation raise a range of critical issues that organizations must consider as they utilize customer innovation. The

development of organizational processes around customer innovation demands a new lens through which to assess both innovative processes and organizational mission.

### Customer-centric Innovation Process

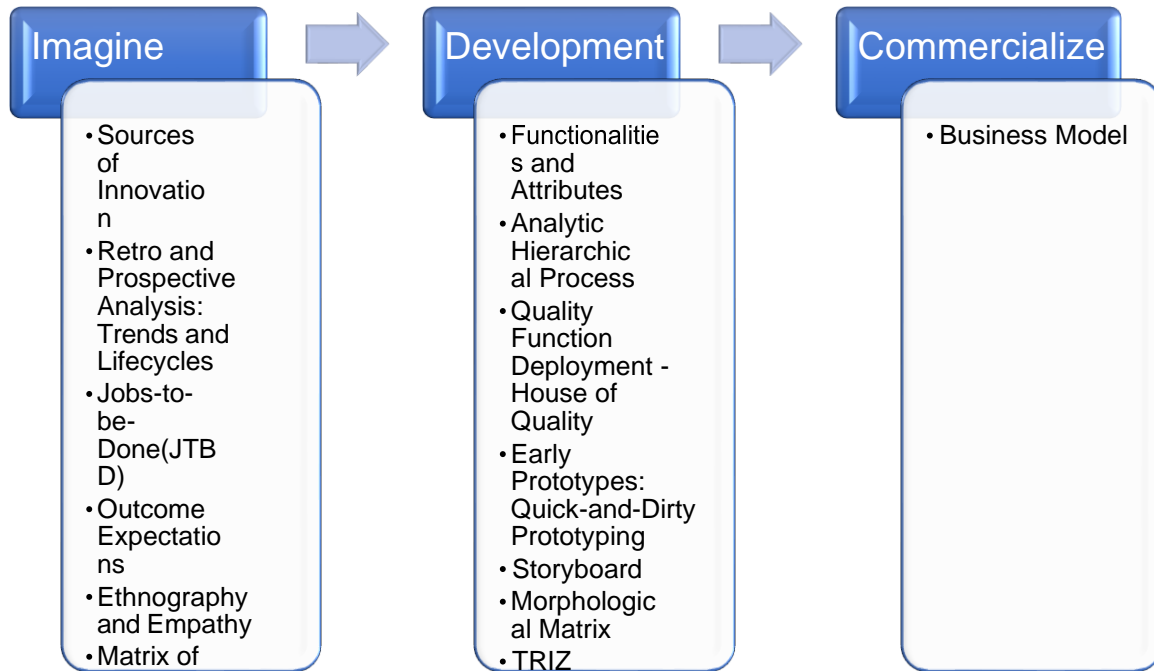


Figure 6 Customer-centric Innovation Process

Source: own study based on D. Romero, A. Molina, A Multidisciplinary Framework and Toolkit to Innovate Customer- Centric New Product Development, Proceedings: 21th International ICE-Conference on Engineering, Technology and Innovation – June 2015, [www.ice-conference.org](http://www.ice-conference.org), available 19.02.2021

Table 1/b Critical Issues, Concerns and Checkpoints of Customer Innovation

Type of Customer Innovation	Critical Issue	Checkpoints
Customer segmentation	Customers and categories are dynamic. Staff must be trained and understand purpose. Right types of innovation must guide segmentation to avoid discrimination.	Are types of customer information prioritized? Are there customer protection guidelines?

Customer analysis	Information overload, particularly from automated systems. Systems must be integrated (i.e., form all types of customer interactions). Privacy and security of customer data must be protected.	Can analyses be traced back to specific customers? Are all systems connected?
Customer communication	Complex problems and valuable clients require in-person interaction. High-quality communication must be paramount.	If outsourced, does customer service still understand customers?
	Many channels and options for communication must exist for “anytime, anywhere” service.	
Customer interaction with organization	Investment must be made in infrastructure for agility in adapting to environment. Risks with established relationships whenever communication channels changed. Copycats may rapidly duplicate ideas.	Can the organization’s structure morph?  Has groundwork for change been laid with established suppliers, vendors, customers, etc.?
Customer interaction with products and services	Customers and technicians need a common language. Novice and expert customers need to be handled differently. Channels of communication need to be varied and flexible.	Are customers segmented by need and expertise? Do technicians interact regularly with customers?

<p>Products and services outputs</p>	<p>Requires rich, human-to-human interaction.</p> <p>“Sticky” or tacit knowledge can be difficult to articulate. Feasibility must be carefully analyzed and customer needs, not specific products, should be identified.</p>	<p>Are there protocols for eliciting knowledge from customers?</p> <p>Are there metrics to evaluate the marketability of ideas?</p>
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Source: K. C. Desouza, Y. Awazu, S. Iha, C. Dombrowski, S. Papagari, P. Baloh, J. Y. Kim, Customer-driven Innovation, Research Technology Management, Taylor & Francis 2008, pp. 35-44.

Innovation in the form of final products and services in an implementation of knowledge form the customer defined as the insights, ideas, thoughts, and information the organization receives form its customer. An organization must therefore actively seek out such knowledge in order to be better prepared to implement product enhancements and innovations.

## Digitalization

Digitalization represents one of the key challenges of our time and is associated with numerous consequences for today's economic players. In addition to the provision of a suitable infrastructure at the macro level, the use of technology for the implementation of innovative business models, entrepreneurial processes, and the shortened communication channels in the context of digitization poses a challenge for many companies (Breuer, 2019).

A growing digitization results in the constant availability of countless pieces of information (data), which must be collected, classified, and used efficiently and in a targeted manner according to individual interests. Furthermore, digitalization is also ensuring that spatial distances lose their relevance, which is rapidly increasing international competitive pressure for SMEs.

Regional companies increasingly find themselves in competition with international monopolies (Breuer, 2019), leading to calls for innovation and individualization of products. The ability to incorporate digital tools into daily work means that entrepreneurial innovations are often initiated or implemented with the help of digital technologies (Accenture, 2015). To provide insight into a selection of existing methods, this report will revisit this topic in Chapter 3.

To connect digital technologies and customer-centric innovation, it can be stated that a globally connected world by digital technologies has changed the role of customers radically over the past decades (Schaubmair, 2017; Steinhoff & Breuer, 2014). Customers have gone from a passive, receiving role to a more active, demanding one in which they are “an active co-designer” (Steinhoff & Breuer, 2014).

Eric von Hippel was one of the firsts to realise that companies’ profits’ increase dramatically compared to their competitors when they engage in more customer-centric innovation activities (Schaubmair, 2017). Not only does customer-centric innovation improve customer satisfaction,



but also it also improves the “product quality, [reduces] risk, and [increases] market acceptance” (Zajkowska, 2017a). Innovation itself is about collaborative learning and working to create something (Edgeman & Eskildsen, 2012).

To further define the term, customer-centric innovation is part of the open innovation philosophy, meaning that the innovation process happens with input from inside and outside of the company to develop new products or services. Research has shown that it is vital to involve the customer at all stages of the innovation process (e.g. Steinhoff & Breuer, 2014; Zajkowska, 2017). In order to do this properly, the company has to know its customers well and gather as much knowledge on their lives, work processes, value chains and value systems, in other words the culture they are involved in (Edgeman, 2012; Schaumair, 2017).

Furthermore, customer-oriented innovations increase both customer benefits and customer loyalty. Because customers are actively involved in the design of products and services and have them shaped according to their needs, the likelihood that these customers will remain loyal to the company in the long-term increases. Trust relationships are thus strengthened, and relationships are built (Hofbauer, 2013).

This report aims to provide SMEs with an overview of the possibilities offered by digital tools for integrating consumer-based innovations into their business models. To this end, the digital tools presented in the literature and publicly available sources are analyzed with regard to their applicability against the background of customer-centric innovations in SMEs. To test these findings, a survey will complement the research to identify the practical application of digital tools. The survey results will be analyzed to identify best-practices in the use of digital tools for customer-centric innovation and to supplement the toolbox with methods that have not yet been identified. Finally, tools are examined for their applicability in SMEs and recommendations for application are given.

## Analog methods of customer-based innovation

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Before digitization arrived, companies were already using methods to involve customers in the development of products and services. The following chapter provides an overview of a selection of these "analog" methods. Due to the diversity of existing methods, only a selection of them can be presented in this report. As explained later, the methods presented pursue the goal of initiating a change from the question "*What do customers want?*" to "*What should the products do for the customers?*" (Leavy, 2017; Ulwick, 2010).

### Lead-User Method:

The lead user method is based on opening up innovation processes of companies in order to promote the development of products and services through the targeted collection of external information. In this process, lead users are specifically sought who can be characterized as advanced users or users. Lead users deal intensively with problems in a field of activity for which the market offers no solution. In order to successfully integrate lead users, it should be ensured that the needs of the lead users are highly likely to mirror the needs of the rest of the market at a later stage. All

in all, it can be summarized that lead users have needs that will be found in the market in the future. Lead users often become active themselves and work out solutions for product innovations that meet their needs (Wagner & Piller, n. d.).

### **Experiments:**

Experiments serve to involve different groups and users in the collection of ideas with the help of a concrete question. The results obtained in this process are compared with each other later on. Often, different groups are formed, consisting of experts in the field on the one hand and normal users on the other. This makes it possible to draw comparisons between the group participants and to combine professional and general knowledge and to consider different points of view. This combination of knowledge and application areas generates new ideas that can be incorporated into the development of products and services (Edvardsson et al., 2010).

### **Living Labs:**

The Living Labs method is used to take customers' ideas, experiences, knowledge and everyday needs as a starting point for innovations. In this context, spaces are often created that are reminiscent of the customer's home so that companies can gather impressions from the real world. In this context, situations are simulated that promote customer-based innovations (Edvardsson et al., 2010).

### **Customer Group involvement:**

Within the framework of this method, regular meetings with customer groups are arranged in order to learn to understand the needs and application areas of the customers and to jointly develop solutions for existing problems. Here, it is essential to determine the group composition in a targeted manner in order to be able to guarantee the marketability of the product or service to be developed. This method makes it possible for companies to have customers accompany the innovations over a long period of time. Products and services can thus be optimized through recurring design and test phases (Edvardsson et al., 2010).

### **Outcome based interviews:**

This method is used to identify customer needs through targeted interviews. The focus here is on gathering insights into what customers want to achieve with a product or service and thus identifying its purpose. With this method, too, it is particularly important to involve a smaller, targeted group of customers in the innovation process rather than a large number of customers who do not reflect the needs of the market. It also makes sense to use trained personnel in order to generate the highest possible information content in the interview results (Edvardsson et al., 2010; Ulwick, 2010).



## Benefits and barriers of using digital tools to integrate customer-centric innovation in SMEs

The diffusion of new digital technologies in innovative activities can become a driving force for the development of new ideas. The very characteristic of innovation in accordance with the Oslo Manual indicates many benefits, which, by improving the efficiency of the company's operations, lead to gaining a competitive advantage by shifting the demand curve for the company's products, e.g. increasing the quality of products, offering new products or gaining new markets or customer groups, or the company's cost curve e.g. reducing unit costs of production, purchasing, distribution or transactions, or relating to the company's innovative capacity, e.g. increasing the ability to develop new products or processes or to acquire and create new knowledge (OECD, no date). The key benefits of applying new technologies to customer-centric innovation are data collection. The benefit of efficient and comprehensive data analysis and collection in innovative activities is related to the acquisition of knowledge resulting from data transformed into information. According to the Report "Measuring the Business Impacts of Effective Data" (*Measuring the Business Impacts of Effective Data*, no date), increasing the efficiency of data processing by just 10% can increase productivity by up to 49% in retail sales and by 39% in consulting services. In other sectors, growth of up to 20% can be expected. Effective data analysis allows you to get to know your customers better, their needs, purchasing habits and preferences in the first place. Thanks to the use of modern cloud solutions and data storage, it is possible to store large collections, which allows constant access to a comprehensive history of customer relationships and analysis of their purchasing behavior. Enterprises see the advantages of data analysis in terms of customer segmentation and matching strategies to deal with each of them. Thanks to this, it is possible to reveal patterns of behavior and dependencies that are visible only after creating a full picture that combines, for example, the customer's activity on social media with his place of residence (geolocation) and a promotional campaign at a given time for a specific product.

Another benefit of using digital technologies is the ability to immediately react in real time and communicate with the customer, e.g. when making a purchase decision and launching an automatic search of internal resources about previous customer behaviors to check if they already have a purchase history or use external sources to supplement his profile.

Effective use of digital tools will allow you to identify the real demand for new products and services on the market, get to know the opinion of consumers about different versions of one article or improve its functionality. As a result, it will translate into an increase in the level of customer satisfaction, improvement of the opinion about the brand and an increase in the level of sales, which according to McKinsey report may increase margin by up to 60% (J. Manyika, M. Chui, B. Brown, J. Bughin, R. Dobbs, Ch. Roxburgh, 2011). For entrepreneurs during galloping changes, the speed of reaction is a source of building an advantage over their competitors.

Enterprises undergoing digital transformation may have concerns about applying new technologies to their innovation activities. As outlined by Bank Gospodarstwa Krajowego et al. (2019), SMEs often face a number of obstacles that hinder digitization projects. These include, in particular, IT security issues, as well as insufficient digital skills. In addition, SMEs report that poorly developed infrastructure and associated slow internet connections hinder the implementation of digital methods in their value creation.

Skills to manage digital tools for customer-centric innovation vary from classical ICT skills (Cesaroni & Consoli, 2015; Demary et al., 2016). Therefore, targeted skills need to be developed within SMEs to efficiently introduce customer-centric innovation. In addition, unclear responsibilities to manage the collected information hinder innovative activities (Demary et al., 2016). A failure in capturing and processing the collected customer information may lead to incomplete pictures of customer needs, which results in additional effort to introduce customer innovation (Schaubmair, 2017).

Besides required IT skills, companies often face the hurdle of uncertain legal environments with respect to competition and property laws as well as liability regulations when collecting customer data. Especially the collection of personal data and varying regulations in the international context represent obstacles (Demary et al., 2016).

High investment and training costs appear to be one of the key concerns in the implementation of digital solutions in innovation activities. The transition to digital solutions involves costs for the purchase of both new IT infrastructure and software. This often exceeds the development capacity of enterprises, especially smaller ones with limited financial resources. In addition, the introduction of new solutions in the functioning of the enterprise is associated with the change of processes, in particular the need for employees to switch to new tools for the functioning of the organization. This means training employees in new tools and how to use them. It is also possible to employ new specialists with specific competences necessary for the proper functioning of new functionalities or the entire equipment. In the calculation of switching to new operating methods, infrastructure maintenance costs should also be added. As a result, the overall cost of transforming an enterprise may exceed the company's financial capacity. This risk also entails the need for additional equipment (Zajkowska, 2021).

Another barrier is related to the potential misuse of data and manipulation. Enterprises realize, which has repeatedly appeared in the results of this study, that information is currently the greatest value in business. Effective information management starts with establishing an appropriate methodology for its collection. Data can come from many sources - both from inside the organization and from outside.

The inclusion of intelligent technology in the production processes leads to the gradual replacement of the natural strength and abilities of humans with robots. As a consequence, it means the loss of some jobs previously occupied by people.

However, the risk may be the increased dependence of employees on technological support, which makes the company vulnerable to technological failures. In addition, the efficiency savings from digital manufacturing require high initial investment and training costs as complex technical equipment and a high level of expertise are required. Likewise, technological limitations in terms of size and production speed must be taken into account, for example the quality of 3D printed products, in particular surface properties, is in constant need of improvement. In addition, digital manufacturing processes can also become targets for abuse and manipulation.

## **Digital tools for customer-centric innovation**

The following subchapter will describe a selection of digital tools to realize customer-centric innovation covered by the literature. As mentioned, the following tools are applicable to be

implemented in different stages of the customer-centric innovation process to collect needed customer information.

To begin with, a basic digital tool is the company website. A clearly structured website helps customers to get an idea of the company and its products. By providing a direct contact person, their email address or a clearly accessible contact form, questions and requests from customers or interested parties can be efficiently recorded and processed. The assignment of clear internal responsibilities and the establishment of internal customer management processes, e.g. via customer relationship management tools, support the processing of incoming customer inquiries and helps to capture customer needs on the demand side (Cesaroni & Consoli, 2015; Liang & Tanniru, 2007). Closely related to the website is the use of emails. Emails serve as another basic tool to enable general communication with customers. With the help of emails, customer inquiries as well as newsletters can be used to build a digital network (idid).

To successfully integrate customer requests that may lead to customer-based innovations the establishment of suitable communication channels is of particular interest. It is important to ensure that the tools used are easy to use for both customers and SMEs. A generally widespread method of integrating consumers into operational processes is the use of social media platforms (e.g. Facebook, Instagram, LinkedIn). The rapid exchange of information taking place in these platforms can both promote collaboration between customers and companies and expand entrepreneurial innovation networks (Deloitte, n.d.). In additions, social media provides access to a new, fast, innovative way of communicating with customers, creating new ways of collaboration, thought sharing and co-creation. Furthermore, products or services can be co-designed, co-produced and enhanced by interaction between companies and customers. Therefore, with the social media revolution, consumers have expanded their role from passive to active consumers (Cesaroni & Consoli, 2015).

It is important for SMEs to be authentic and personal on social media. It is also important for companies to actively use their social media and to engage with both already established and potential new customers through competitions, quick responses or by sharing user-generated content. This can be a photo of a product, an opinion or feedback, or simple open questions to engage with customers and show them that you value their opinion on potential new developments and products (Carter 2019; George 2019). Nevertheless, SMEs can also use social media without a major strain put on their (financial) resources due to its accessibility and little or no monetary investment needed.

Besides the before mentioned channels, social media also offers the opportunity to use forums, blogs or other social media platforms to further establish relationships with customers. These relationships can be used to collecting first-hand information of customers (Cesaroni & Consoli, 2015). In addition, companies can collect data from customers visiting their website and social media presence which can be used to generate more customer-centric innovation. Digitalisation therefore enables companies to perform better in the long run because these companies are usually more connected to their customers and the markets they operate in (Columbus, 2020).

A further integration of digital tools for the realization of customer-centric innovation lies in the use of the web 2.0 in SMEs (Liang & Tanniru, 2006). Web 2.0 describes a socio-technological change in the usage of the internet, from a traditional information sharing and e-commerce to a participation of the web users to generate additional benefits. Therefore, the internet is transformed

into a productive platform. The focus lies in gathering different kind of data that is available on the world wide web. As examples of web 2.0 tools, Wikis and social tagging can be named. While wikis enable users to publish information on a specific topic online (so-called crowd sourcing), social tagging describes the collection of meaningful, intuitive and high-quality keywords that enable context indexing of information objects and implemented to improve or refine search results (e.g. on a corporate webpage) (Siepermann, 2021).

It can be summarized that the described technological tools can foster the knowledge acquisition, transfer and elaboration for customer-centralized innovation. Customer data can be collected in various ways such as through customer feedback, during transitions or by using cookies and web-server logs (Castagna et al., 2020). Furthermore, the authors emphasize that relational tools such as email, blogs or content management systems enhance communication between companies and customers, while collaborative tools such as social media improve knowledge sharing and relationship building. With respect to a company’s marketing activities, digital tools such as mobile and banner advertising or direct email marketing (e.g. newsletter) help to gather customer data and share knowledge.

## Customer-centric Innovation in SMEs - Results of an Empirical Research

Source:

- Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics, Erika Szilágyiné Fülöp, Ádám Bereczk: Customer-centric Innovation in SMEs. Results of an Empirical Research, 2021

### The aim of the research

The aim of this research was to study how SMEs create and implement customer-based innovations, which digital technologies they use to support them, what kind of benefits and barriers the company realizes while involving customers in innovation processes. Best practices were also collected, while real-life experiences of SMEs are very valuable for developing specific training and education measures for SMEs.

### Research methodology

Regarding the research method, a questionnaire survey was conducted to achieve the research goals and answer to the research questions. A literature review regarding customer-centric innovation, and the available ICT and digital solutions for companies served as a professional basis for the questionnaire. The questionnaire contains the following main topics:

- Company data
- Level of consumer involvement in innovation processes
- Which stages of product innovation are consumers involved in?
- How are the consumers involved?
- What digital tools, ICT are used in consumer-centric innovation?
- What digital devices are normally used during business operation?
- What benefits have companies realized from using customer-centric innovations supported by digital tools?

- What are the obstacles and difficulties of using digital devices in the company?

The marketing research was conducted online (used Survey Monkey). The interview took place between 7 April and 8 June 2021. During this period, the questionnaire was started by 101 respondents, but only 95 was evaluable answer from 11 different countries. The most responses originated from Germany, Hungary, Poland, and Denmark. The target group was clearly micro, small, and medium-sized enterprises, but large companies also appeared among the respondents. (Their responses were not excluded during the analysis but were considered as a control group.) As the data collected during the fieldwork cannot be considered representative, the findings obtained during the data analysis cannot be generalized, i.e., the results are valid only for the sample. Data analysis was performed with IBM SPSS Statistics (Version 26) software package, in which mainly univariate analysis were performed (descriptive statistics, frequency tables, means, standard deviations), but some bivariate analyses were also conducted in the form of cross-tabulation and correlation analysis.

### **Information about companies**

The survey received 95 evaluable responses. The largest proportion of respondents are from Germany (27 companies). More than 80 percent of the respondents have jurisdiction in Germany, Hungary, Poland, or Denmark. Other countries participating in the research are Lithuania, Belarus, Estonia, Finland, Bulgaria, Latvia, and Russia. The number of respondents is two-two for Belarus, Estonia, and Finland, and one-one for Bulgaria, Latvia, and Russia. Based on the proportions of respondents leaving the participating countries and the number of respondents, the research cannot be considered representative.

Most of the respondents can be related to education and training (13 companies). Half of respondents work in the following sectors: education; construction; manufacturing; agriculture, forestry, and fishing; wholesale and retail trade, repair of motor vehicles and motorcycles. Two-two respondents from the areas of accommodation and food service activities, financial and insurance activities, and human health and social work activities were included in the sample; one-one respondents from the areas of public administration and defence (compulsory social security), transport and storage, water supply; sewerage; waste management and remediation activities were sampled. Of the 95 respondents, nineteen identified an economic sector other than the sectors surveyed as to their area of activity. They had to specify the sector in the text. Other such areas are audit, animal welfare, other services, information technology, translation and interpretation, car dismantling. Some of the respondents indicating the other category answered incorrectly because the list registered included the sector they should have chosen. Examples are manufacturing, wholesale, info-communication.

In the countries that accounted for more than 80 percent of respondents, the following sectors were identified most frequently (excluding the other category). Three-three of the German respondents work in the fields of info communications, trade and vehicle repair, and construction. Two-two respondents in the fields of agriculture, manufacturing, and hospitality. Of the Hungarian respondents, five indicated the construction industry, two-two the trade and vehicle repair, and the scientific and technical activities. Of the Polish respondents, five indicated education and training, two-two administration and construction. Of the Danish respondents, three indicated education and training and two agricultures. Out of a total of nineteen respondents in other sectors, eighteen



were sampled from the above four countries. Based on the sample distribution of economic sectors, the survey cannot be considered representative.

The number of employees was surveyed as a characteristic of the company size. Of the respondents, fifty-seven indicated less than ten employees. More than 10 percent of the respondents have more than two hundred and fifty employees. Based on the number of employees, the survey cannot be considered representative because the proportions in the sample do not match the proportions in the total population.

More than 80 percent of the companies/organizations surveyed have been established for more than five years. We examined the relationship between company size and operating time. Fourteen of the companies/ organizations with less than ten employees (fifty-seven) have been operating for less than five years. In the case of organizations belonging to the categories of ten and fifty, fifty-one and two hundred and fifty, and more than two hundred and fifty, one respondent indicated that the company/organization had been established less than five years ago.

According to the main costumers of the companies several of the answers (B2C, B2B, B2G) to the question could be marked at the same time. Ten respondents did not indicate either option. Of the remaining eighty-five respondents, twenty-eight indicated two options and eight respondents indicated all three. In fifty-seven cases of the responses, the customers are mostly individuals, in fifty-six cases other companies, organizations, and in fifteen cases governmental or public institutions. We examined the relationship between the customer and the company size (number of employees). Of the fifty-three organizations with less than ten employees, thirty-six are individuals, thirty-two are companies, and six are government and public institutions. Of the fifteen organizations that employ between ten and fifty people, twelve are private individuals, eleven are companies, and four are government or public institutions. Of the seven organizations employing between fifty-one and two hundred and fifty people, three are individuals, five are companies, and two are government or public institutions. Of the ten organizations with more than two hundred and fifty employees, six are individuals, eight are companies, and three are government or public institutions. It can be stated that in the case of the number of employees with less than fifty-one persons, the customers of the examined organizations are mostly private individuals and the number of companies in these organizations is seven to eight percent points less than the number of customers. In larger organizations, companies appear as buyers for the most part. Government and administrative organizations appear as customers in ten to thirty percent.

### **Digital communication channels used for communicating and collaborating with customers**

Respondents could also mark more of the digital communication channels used at the same time. The highest proportion was indicated by e-mail use (sixty-five out of seventy-seven respondents). This was followed by the use of social media (thirty-two of seventy-seven respondents). In addition, the use of online advertising, an interactive website, and Q&R are medium (> 20%). The use of novel tools such as chatbots, support teams, or gamification tools is present, but in a rather minor proportion (Figure 3).

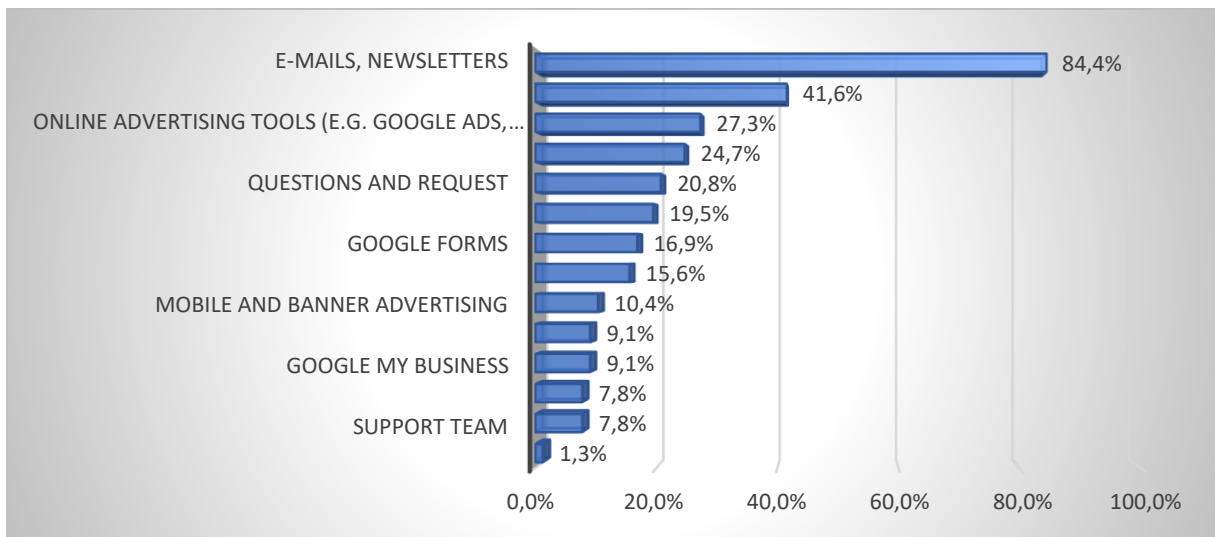


Figure 3 Means of communication used

Similar to general information technologies and tools, the widespread nature of the use of communication solutions is typical of German and Danish organizations (e.g., support team, content marketing, gamification). Of these, six and five tools do not appear at all for Hungarian and Polish respondents, respectively, while only two-two tools do not appear for German and Danish respondents (Table 2).

Table 1 Communication tools used by countries

	Denmark	Germany	Hungary	Poland
E-mails, newsletters	76.9%	85.7%	94.4%	81.8%
Social media platforms (e.g., Facebook, Instagram, LinkedIn)	53.8%	42.9%	33.3%	36.4%
Online advertising tools (e.g., Google Ads, Facebook/Instagram Ads)	30.8%	28.6%	11.1%	27.3%
Interactive company website	23.1%	38.1%	16.7%	18.2%
Questions and request	7.7%	19.0%	16.7%	9.1%
Mobil apps	38.5%	9.5%	27.8%	9.1%
Google forms	23.1%	4.8%	22.2%	18.2%
Content marketing strategy (e.g. forums, blogs)	23.1%	23.8%	5.6%	0.0%
Mobile and banner advertising	15.4%	0.0%	5.6%	18.2%
Chatbot	7.7%	19.0%	0.0%	9.1%
Google My Business	0.0%	28.6%	0.0%	0.0%
App Store	23.1%	4.8%	0.0%	0.0%
Support team	15.4%	9.5%	0.0%	0.0%
Gamification tools	0.0%	0.0%	0.0%	0.0%

Distribution of the used communication tools was examined in the grouping according to the number of employees. It is not possible to establish a clear pattern in terms of the tools used.

### Involvement in customer-centric innovation

Eighty-six responses were received to the presence of customer-centric innovation (Figure 4). Overall, forty-six organizations employ customer-centric innovation and forty do not. In organizations with less than ten employees, the proportion of users and non-users is almost the same. In organizations with ten to fifty employees, the number of non-users is 50% higher than the number of users. In organizations with fifty-one to two hundred and fifty employees, the number of non-users is 40% lower than that of users. Organizations with more than two hundred and fifty employees use customer-centric innovation in four times as many organizations as they do not. Summarizing, there is no clear relationship between the number of users and the application of customer-centric innovation.

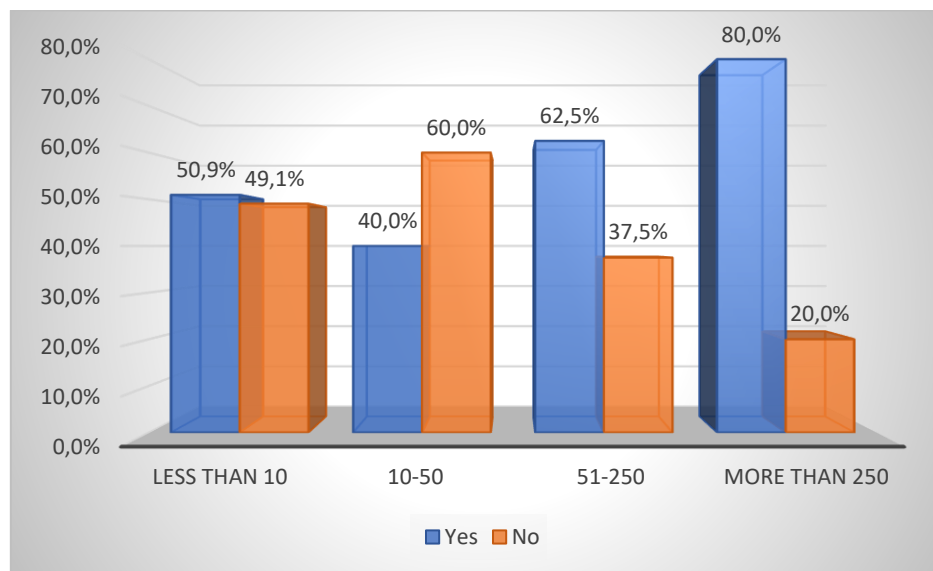


Figure 4 Existence of customer-centric innovation

Distribution of responses sampled from the four countries with the most responses was also examined (Figure 5). For Danish respondents, the number of organizations using customer-centric innovation is slightly more than twice as high as it is not. In case of Hungarian respondents, this ratio is nine times. For German respondents, customer-centric innovation is not used in three times as many organizations as to where it is used. According to data from Poland, the difference between the presence and absence of application is minimal (7 percentage points).



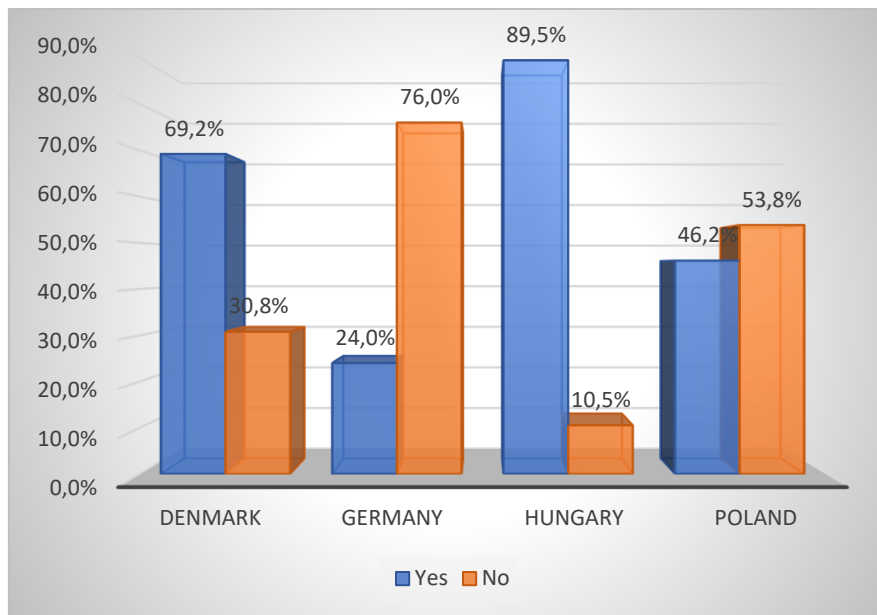


Figure 5 Existence of customer-centric innovation by countries

### Reason for the lack of application of customer-centric innovation

Eighty-six (Q4, Question 8) answered the (previous) question on the application of customer-centric innovation. After that, the series of questions went in two different directions. If customer-centric innovation is not used, the reason for this had to be specified by answering the present question (questions k5, 9 \*). If applicable, the following questions (questions k6, 9; questions k7, 10;...) had to be answered. However, the total number of respondents for questions k5 and k6 is seventy-seven, which is different from the number of respondents for question k4. This means that biased results should be expected for the answers to question k4.

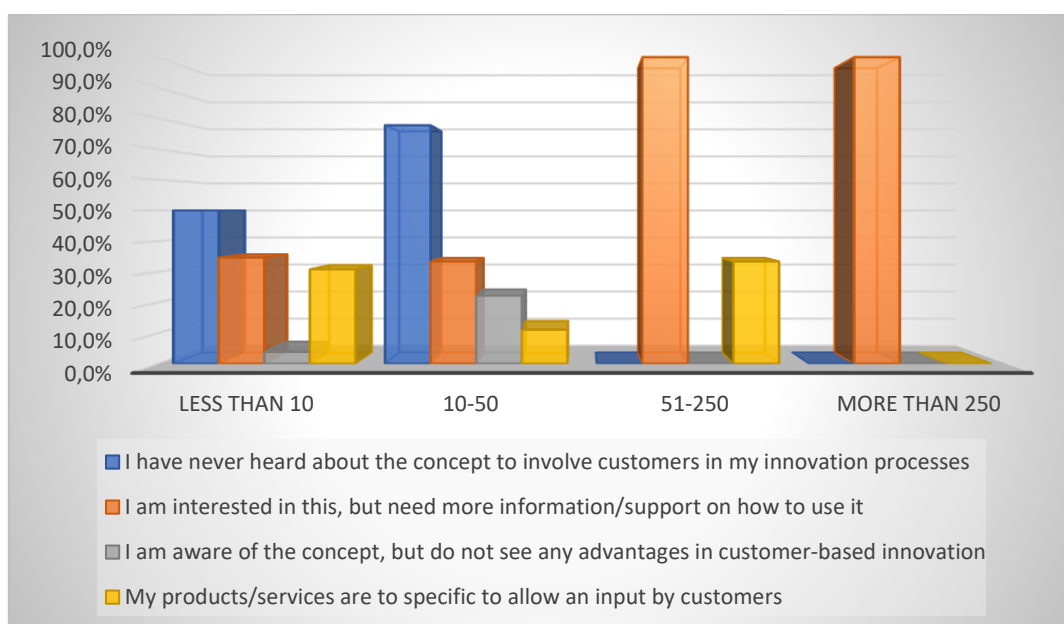


Figure 6 Reason for the lack of application of customer-centric innovation

Thirty-nine respondents were asked, “why does the organization not engage in customer-centric innovation” (Figure 6). Organizations with fewer than fifty employees typically are unfamiliar with the concept of customer-centric innovation. And those who employ more than fifty-one people are typically considered insecure. Most indicated a second response that they had heard of customer-centric innovation, but would need more knowledge, information, or support for the application. Fewer than ten employees indicated that although they were familiar with customer-centric innovation, they did not think they could reap its benefits. In the case of slightly more organizations employing less than two hundred and fifty people, the respondents indicated that their product or service is not suitable for the application of customer-centric innovation. It should be noted that although the response options are more alternative, there were some respondents who indicated several options at the same time, which may skew the results.

Table 2 Reason for the lack of customer-centric innovation application by countries

	Denmark	Germany	Hungary	Poland
I have never heard about the concept to involve customers in my innovation processes	75.0%	63.2%	0.0%	0.0%
I am interested in this, but need more information/support on how to use it	25.0%	47.4%	50.0%	16.7%
I am aware of the concept, but do not see any advantages in customer-based innovation	0.0%	5.3%	0.0%	33.3%
My products/services are too specific to allow an input by customers	0.0%	26.3%	50.0%	50.0%

Distribution of responses for the four largest sampled countries was also examined (Table 3). The reason for the lack of application in Danish and German organizations is mainly that the respondents did not hear about the concept and, to a lesser extent, that they are uncertain about the application due to lack of information. 26% of German organizations reported that their product or service was not suitable for customer-centric innovation. None of the respondents from the Hungarian and Polish organizations indicated the possibility that they do not know the essence of the concept. Half of the Hungarian respondents are unsure or uncertain due to the relatively little information available, and the other half said that the product or service is not suitable for the application of the concept. For half of the Polish respondents, the product or service is incompatible with customer-centric innovation, and for the rest of the respondents, there is little information available for the application (17%) or the benefits of using the concept are unknown (33%). It is clear from the data that the German respondents indicated several options at the same time so that a small distortion of the answers can be attributed to this.

### The level of involvement of customers in the following types of innovation

Thirty-eight answered the question which types of innovation involve customers (Figure 7). In the case of question k4, forty-six stated that there was customer-centric innovation, which means that

eight people did not comment at all on the question of specifying the innovation and did not indicate the possibility that they had no information.

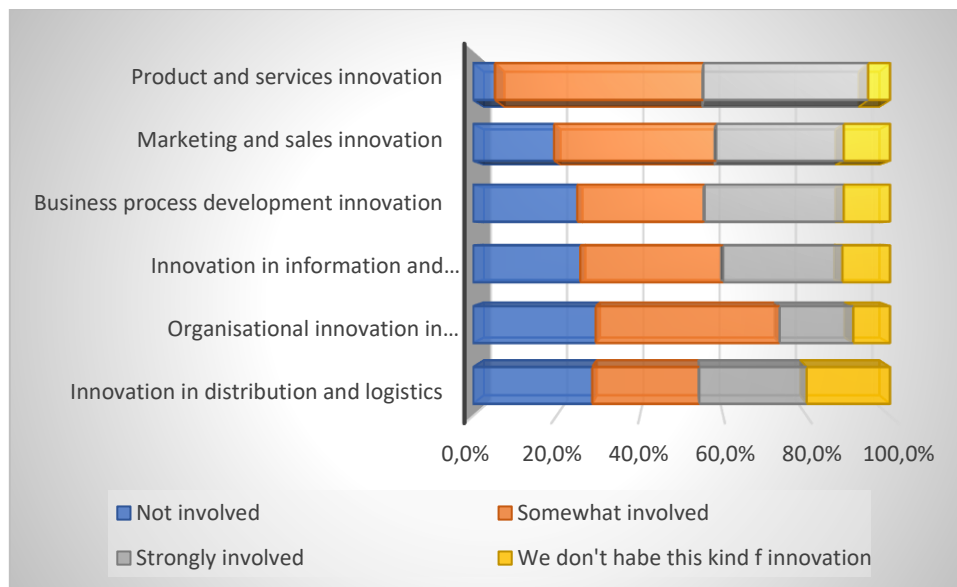


Figure 7 Involving customers in different types of innovation

According to 36 respondents, customers are involved in some extent in case of product and service innovation, twenty-nine respondents in case of marketing and sales innovation, twenty-seven in case of business process innovation, twenty-six in case of info communication systems innovation, twenty-four in case of organizational innovation and logistics, in case of innovation according to thirty-five respondents.

90% are involved in product and service innovation, 69% in marketing and sales innovation, 34% in business process innovation, and 63% in info communication systems innovation, 62% for organizational innovation and 51% for logistics innovation.

Table 3 Involving customers in different types of innovation in each countries

		Denmark	Germany	Hungary	Poland
Product and services innovation	Not involved	14.3%	0.0%	0.0%	0.0%
	Somewhat involved	42.9%	80.0%	33.3%	66.7%
	Strongly involved	42.9%	20.0%	58.3%	16.7%
	We do not have this kind of innovation	0.0%	0.0%	8.3%	16.7%
Marketing and sales innovation	Not involved	28.6%	40.0%	0.0%	0.0%
	Somewhat involved	42.9%	40.0%	10.0%	66.7%
	Strongly involved	28.6%	0.0%	70.0%	16.7%
	We do not have this kind of innovation	0.0%	20.0%	20.0%	16.7%

Innovation information communication systems	in and	Not involved	14.3%	40.0%	22.2%	16.7%
		Somewhat involved	42.9%	40.0%	22.2%	50.0%
		Strongly involved	42.9%	20.0%	22.2%	16.7%
		We do not have this kind of innovation	0.0%	0.0%	33.3%	16.7%
Organisational innovation administration and management	in and	Not involved	14.3%	80.0%	33.3%	0.0%
		Somewhat involved	57.1%	20.0%	33.3%	60.0%
		Strongly involved	28.6%	0.0%	11.1%	20.0%
		We do not have this kind of innovation	0.0%	0.0%	22.2%	20.0%
Business process development innovation	process	Not involved	28.6%	40.0%	10.0%	16.7%
		Somewhat involved	42.9%	60.0%	20.0%	16.7%
		Strongly involved	14.3%	0.0%	60.0%	33.3%
		We do not have this kind of innovation	14.3%	0.0%	10.0%	33.3%
Innovation distribution logistics	in and	Not involved	42.9%	60.0%	11.1%	0.0%
		Somewhat involved	28.6%	0.0%	11.1%	33.3%
		Strongly involved	14.3%	0.0%	55.6%	33.3%
		We do not have this kind of innovation	14.3%	40.0%	22.2%	33.3%

The country distributions for the countries with the highest numbers were analysed in the four samples (Table 4). On average, 47% of German respondents, 68% of Hungarians, and 72% of Danish and Polish involve their customers in some type of innovation process. Danish respondents are most involved in product and service, info communication, and organizational innovation (86-86%). For the other types, these values range from 43 to 72%. German respondents are most involved in product and service innovation (100%), and involvement in innovation in info communications and business processes is relatively strong (60%). Other values range from 0 to 40%. Hungarian respondents mostly involve their customers in product and service innovation (92%) and innovation in marketing and business processes (80-80%). For the other types, the values are between 44-67%. Polish respondents mainly involve their customers in product and service innovation, marketing and sales innovation (83-83%), and organizational innovations (80%). For the other types, the values range from 50 to 67%. On the one hand, based on this

relatively mixed picture, it can be concluded that no sharp pattern can be detected between types of innovation and involvement; on the other hand, involvement in product and service innovation is relatively strong everywhere.

### Degree of involvement of customers in the product and service innovation phases

In this question, we examined which customers are specifically involved in which process phase of the product and service innovation most affected by customer engagement (Figure 8). The degree of involvement had to be given on a scale of one to five, where the value of five means: strongly, the value of one means: not at all.

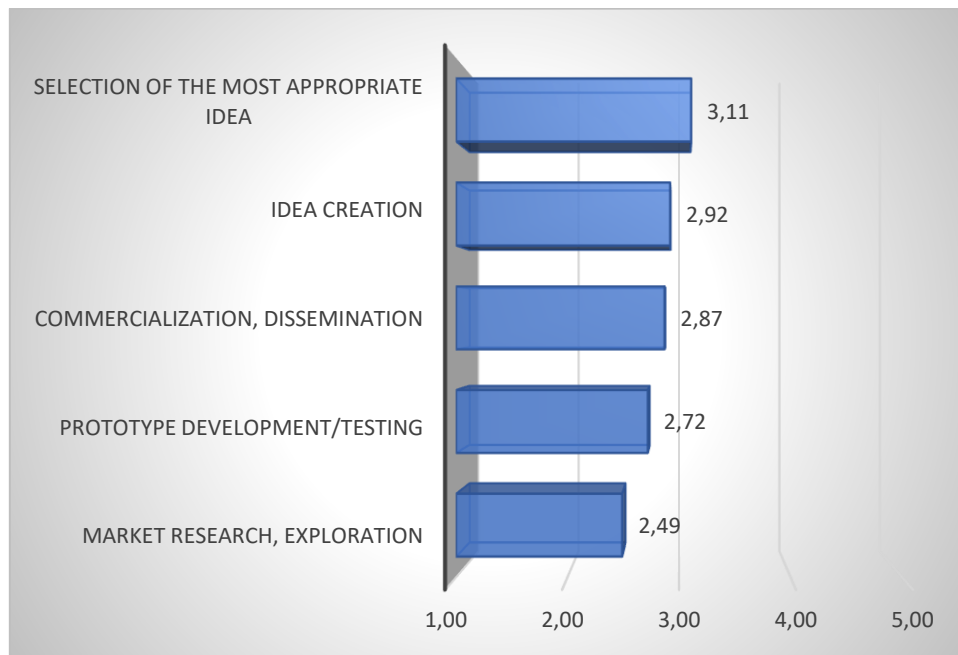


Figure 8 Degree of involvement in the product and service innovation phases

Companies primarily involve their customers in the brainstorming phase (3.11) and as we move forward in the innovation process, this value continues to decline. In case of organizations with less than fifty-one employees, the three stages of innovation, commercial introduction, are contrary to this finding, the degree of involvement in this stage is higher than in the case of the second stage (idea implementation). For organizations with more than fifty employees, involvement is strongest in prototype development and testing. Employers with more than two hundred and fifty people also strongly involve customers in the implementation phase of the idea (Table 5).

Table 4 Degree of involvement in the product and service innovation phases by number of employees

	less than 10	10-50	51-250	more than 250
Selection of the most appropriate idea	3.30	2.83	2.50	3.00
Idea creation	3.15	2.17	2.33	3.14
Commercialization. dissemination	3.32	2.33	2.33	2.14

Prototype development/testing	2.70	2.00	3.00	3.29
Market research. exploration	2.71	2.00	1.33	2.71

The extent of involvement for the four countries sampled in large numbers was also examined (Table 6). In case of Denmark, the involvement is strongest in the idea implementation phase (2.71), followed by the ideation phase and then the prototype development phase. For commercial and marketing activities, involvement is minimal (2.0). In Germany, the implementation of the idea and the development of the prototype has a strong involvement (2.6) and are followed by the ideation phase (2.4). Like Denmark, involvement in the innovation phases of commercial and marketing activities is minimal (1.8-2.0). In Hungary, the involvement is strong in case of commercial activities (4.25), followed by the brainstorming (3.9) and then the marketing (3.73) phases. The involvement is also strong in the implementation phase of the idea compared to the above two countries (3.6). The value of prototype development and testing is 3.2, but this is higher than the highest values in the previous two countries. In Poland, involvement in the brainstorming phase is maximal (3.33), followed by the next three phases with 2.67-2.83 and then the last phase with 1.83. No clear regularity can be detected between the phases when examining the countries.

Table 5 Degree of involvement in product and service innovation phases by countries

	Denmark	Germany	Hungary	Poland
Selection of the most appropriate idea	2.57	2.40	3.90	3.33
Idea creation	2.71	2.60	3.60	2.83
Commercialization. dissemination	2.00	1.80	4.25	2.67
Prototype development/testing	2.43	2.60	3.20	2.83
Market research. exploration	2.00	2.00	3.73	1.83

### Methods for engaging consumers in customer-centric innovations

In the next question, we sought answers to what methods companies use to engage their customers in their innovation processes. The following methods were included in the response options:

- Surveys/questionnaires
- Interviews
- Focus Groups
- Brainstorming
- Observations (customers are observed in daily life personally)
- Test Groups
- Field Test (testing products and/or services in real life circumstances)
- Simulations and visualizations
- Living Labs (Cooperation with customers in company’s laboratories and workshops)
- Diary Search: (target groups are asked to write the product and/or service experiences in a pre-structured online diary)
- others



37 evaluable answers were received to this question from the 46 companies involved in customer-centric innovation (8 large companies, 5 medium-sized companies, 6 small companies, 27 micro-companies). The most common method of involving customers is conducting interviews, surveys and questionnaires. (Figure 13) More than half of the respondents (21 and 19 respondents) use these methods, which are relatively easier to implement and better known, especially among SMEs. Besides, observing customers in their daily lives plays an important role in supporting innovation processes. 43 % of companies involved in customer-centric innovation (and answering this question) use the observation method. Brainstorming was indicated by more than a quarter of respondents (27%). The same proportion is included in case of the Field Test, in which products and/or services are tested under real conditions. Seven companies (19%) use Test Groups to explore and incorporate their customers’ opinions and experiences. In the case of the most common methods, the sectoral classification of companies shows a varied picture, no clear conclusion can be drawn regarding the specifics of the sector. A similar proportion of users came from the industrial-construction and commercial-service sectors. We did not find any significant differences in frequently used methods in terms of company size too. Less commonly used methods of customer engagement include (Figure 9):

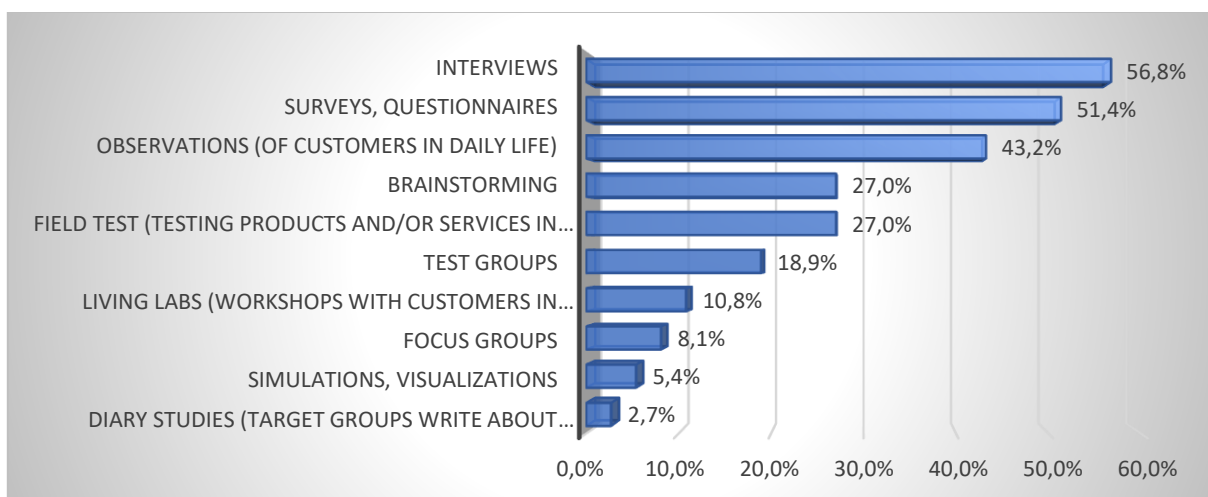


Figure 9 Methods used for involving customers in innovation processes

- Living Labs (Cooperation with customers in the company’s laboratories and workshops): four companies use the method to engage customers. Two companies are active in the manufacturing industry, two in the field of education. These are companies operating in four different countries. Three companies have more than 250 employees and the fourth company has 10 to 50 employees. Apparently, this method is typical for larger company sizes. Each company has been operating for more than 5 years. All four companies sell in the B2B market, B2C customers have three companies. Two companies are also active in the B2C, B2B, and B2G markets.
- Focus Groups: three companies use the method to engage customers. One company is active in the manufacturing industry, one in the field of education, one in the field of other services. These are companies operating in three different countries. Two companies have more than 250 employees and one company has less than 10 employees. Apparently, this

method is also more typical for larger company sizes. All three companies have been operating for more than 5 years.

- Simulations and visualizations: Only two companies use this method to engage customers. One company is active in the construction industry, one in the field of education. These are companies operating in two different countries. One company has more than 250 employees and one company has 51-250 employees. Apparently, this method is also more typical for larger company sizes. Both companies have been operating for more than 5 years.
- Diary Search: (target groups are asked to write the product and/or service experiences in a pre-structured online diary): Only one company uses this method to engage customers. The Danish company is active in the field of education. The company has more than 250 employees and has been operating for more than five years.

Although no general conclusions can be drawn, the results of our survey show that more complex, organized solutions for customer involvement are typically used by larger (primarily large and medium-sized companies) and more mature companies.

Fourteen companies also identified three or more ways to engage their customers. Most of them (ten companies) operate in the service sector. Companies in the field of education (six companies) should be highlighted in terms of the variety of methods used.

### Methods for engaging consumers in customer-centric innovations by countries

The frequency of the methods application was examined by country. 4 countries (Germany, Hungary, Poland, and Denmark) were chosen from which the most evaluable responses were received. The data of the previously mentioned countries were compared to explore whether there are similarities or significant differences between companies in each country.

Only those companies were examined that have been involved in customer-oriented innovation and have provided answers to this question. Thus, Germany (five), Hungary (eleven), Poland (six), and Denmark (six) are included in the analysis.

The most commonly used methods are marked in green, the medium frequently used methods are marked in yellow, and the less frequently used methods are marked in red. Darker colours have the highest frequency for green and red for the lowest frequency. (Table 7)

Table 7 Methods for engaging consumers in customer-centric innovations by countries

	Denmark	Germany	Hungary	Poland
Interviews	50.0%	60.0%	50.0%	33.3%
Surveys, questionnaires	50.0%	80.0%	25.0%	66.7%
Observations (of customers in daily life)	33.3%	60.0%	66.7%	33.3%
Brainstorming	50.0%	0.0%	8.3%	50.0%
Field test (testing products and/or services in real life circumstances)	0.0%	60.0%	41.7%	0.0%
Test groups	33.3%	20.0%	8.3%	16.7%
Living labs (workshops with customers in company's laboratories)	16.7%	20.0%	0.0%	0.0%



Focus groups	16.7%	20.0%	8.3%	0.0%
Simulations, visualizations	16.7%	0.0%	0.0%	0.0%
Diary studies (target groups write about product and/or service experiences in a pre-structured online diary)	16.7%	0.0%	0.0%	0.0%

The results are similar in each country as we saw in the overall sample. The most common used methods are Interviews, Surveys, Questionnaires, and Observations. The least commonly used methods are Living labs (workshops with customers in the company’s laboratories), Focus groups, Simulations, Visualizations, and Diary studies.

Remarks regarding countries:

- In Denmark, in addition to Interviews and Surveys, Questionnaires, the use of Brainstorming is the most popular. Test groups are also given more weight than in other countries and in the overall sample. However, no company indicated the Field test method for customer involvement. Denmark had the most varied range of methods used to engage customers.
- For German companies, the three most common methods are the same as in the whole sample. However, the higher rate of Field test use among respondents is noteworthy.
- In case of Hungarian respondents, the observation of consumers in their daily lives received the highest proportion. This was followed in the order of the application by the interviews and the Field test. Surprisingly, Surveys, questionnaires, which are popular elsewhere, are not among the most common solutions. More complex, organized solutions (Living labs, Simulations, Visualizations, and Diary studies) are not typical for responding companies.
- For Polish companies, Surveys, Questionnaires, and Brainstorming methods were the most common methods to engage customers. Overall, Polish respondents indicated a narrower range of methods used.

Low sample sizes are not suitable for drawing general conclusions, they are only valid for the analysed sample.

### **Categorizing consumers based on their needs and expertise**

The next question was whether companies categorize their customers based on their needs or expertise when involving them in the innovation process. This was considered to be an important issue because different types of feedbacks and experiences can be incorporated in case of different customers. Different kind of information can be obtained from lay customers and from professional users in the product development process. Kind of information are extremely useful. Those companies were analysed and examined that are involved in customer-centric innovation and answered for this question (38 companies). Overall, slightly more than half (52.6 percent) of respondents categorize their customers based on their needs and expertise.

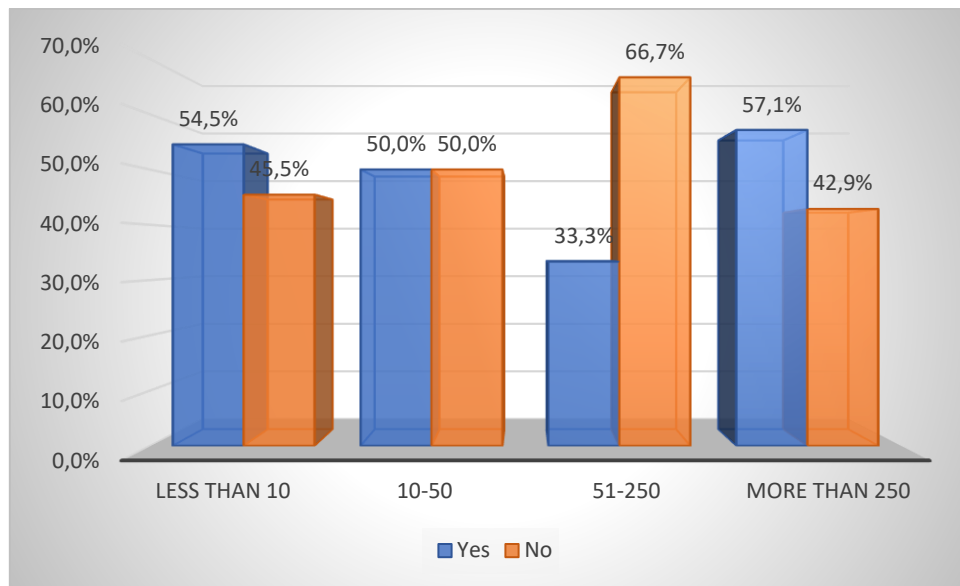


Figure 10 Categorizing consumers based on their needs and expertise by company size

The distribution by the company size is as follows in the sample: seven large companies, three medium-sized companies, six small companies, twenty-two micro-companies. In almost all size categories, at least half of the companies strive to differentiate their customers according to their needs and expertise. The rate was lower for medium-sized companies, but this reflects the responses of only 3 companies. (Figure 10)

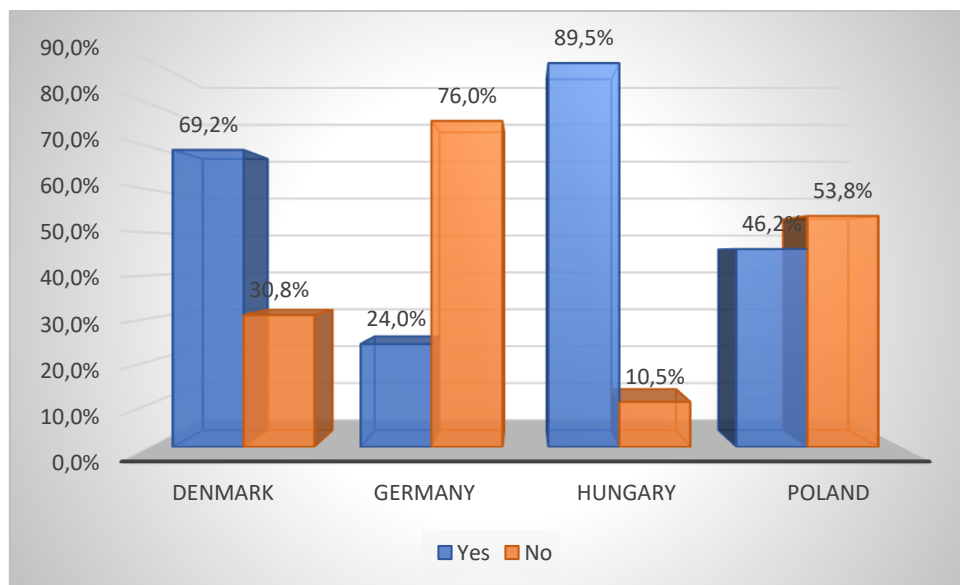


Figure 11 Categorizing consumers based on their needs and expertise by countries

The analysis by country shows a more interesting picture (Figure 11). Thirty responses to this question were received from the four countries selected. Denmark is represented on the chart based on seven companies, Germany five, Hungary twelve and Poland six. Accordingly, the differentiation and categorization of customers based on their needs and expertise is much more

typical in the case of Danish and Hungarian companies. A smaller half of Polish companies apply this distinction. German companies make the least use of categorization.

### Difficulties in involving customers

When implementing customer-centric innovations, companies face with several difficulties in engaging customers. We examined which factor means the greatest difficulty in exploring the needs and experiences of customers and in communicating with customers.

The following difficulties could be identified:

- Involving consumers is time consuming
- Consumer involvement requires financial resources
- Involving consumers allocates resources, is resource-intensive (Infrastructure, technology, IT)
- It is difficult to identify customers who can provide innovative ideas during the innovation process
- It needs Know how
- Others

Based on the responses of thirty-five companies, the biggest difficulty proved to be time requirements as well as the need for financial resources (Figure 12). Based on this, it seems that the issue of getting to know consumer opinions and involving consumers is mostly a matter of time and money. More than half of the companies had difficulty with these two factors. This is presumably related to the fact that human resources are scarcer in the case of SMEs, there is no person who could deal with this separately at the company. And hiring another employee would incur additional costs for them. The identification of consumers with innovative ideas and the technical and infrastructural conditions did not prove to be a difficulty among the responding companies.

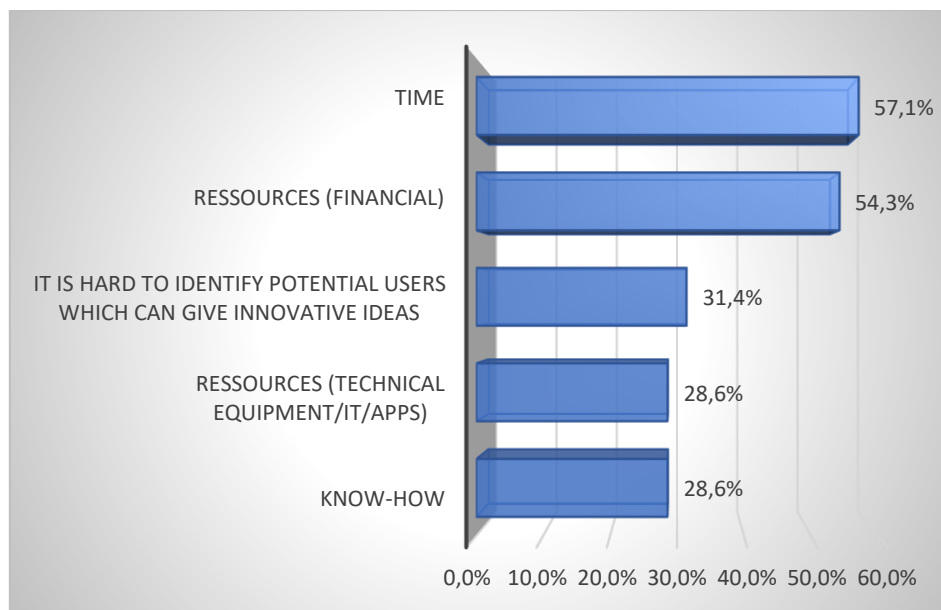


Figure 12 Difficulties in involving customers

The existence of a marked difference was examined among countries in perceiving difficulties in engaging consumers. (Table 8) As before, data from Germany, Hungary, Poland, and Denmark were compared. In the examination only those companies were studied that have been involved in customer-centric innovation and have answered that question. Thus, Germany is included in the analysis with five companies, Hungary with eleven companies, Poland with five companies and Denmark with six companies. The most frequently marked difficulty was marked in green, the moderately marked methods in yellow, and the less frequently marked methods in red. Darker colours have the highest frequency for green and red for the lowest frequency.

Table 8 Difficulties in involving customers by countries

	Denmark	Germany	Hungary	Poland
Time	66.7%	60.0%	45.5%	40.0%
Resources (financial)	50.0%	20.0%	54.5%	80.0%
It is hard to identify potential users which can give innovative ideas	16.7%	60.0%	36.4%	20.0%
Resources (technical equipment/IT/apps)	16.7%	20.0%	45.5%	20.0%
Know-How	33.3%	20.0%	27.3%	40.0%

Remarks regarding countries:

- Two-thirds of Danish companies report that the time required to involve consumers is the biggest challenge, and half of the companies mentioned the need for financial resources to involve consumers as a difficulty. The Danish experience is in line with the results of the analyses based on the whole sample.
- In case of German companies, financial factors meant less of a difficulty, the time required to involve consumers and the identification of consumers with innovative ideas were more often among the difficulties. German respondents indicated the least impediment.
- More than half of the Hungarian companies identified the financial factor as an aggravating circumstance. In addition, other resources as well as the need for time were among the more frequently mentioned difficulties.
- In case of Polish companies, the financial factor was predominantly highlighted as a difficulty for companies.

Low sample sizes are not suitable for drawing general conclusions, they are only valid for the analysed sample.

### Benefits from customer-centric innovations

In the survey, was examined the kind and extent of benefits reached by companies through the introduction of customer-centric innovations. The available benefits are divided into five major groups:

- Financial benefits (increased sales revenue, profitability, cost reduction)
- Growing operation effectivity (increased sales volume, product and service portfolio, productivity, product and service quality, speed and reliability of communications and transactions, positive change in business model and business practice)

- Market benefits (increased number of customers and potential clients, market position, market share, entering of new markets, global trade, geographic expansion, business linkages, competitiveness)
- Increasing customer satisfaction (increased understanding and response to customer needs, tailor-made/customised product development, better and faster communication with the customers)
- Improving organizational image, reputation

Respondents were able to rate on one to five Likert scale, the extent to which each benefit came to their company through the introduction of customer-centric innovation. The numerical values have the following meanings: 1: not beneficial, 2: slightly beneficial, 3: somewhat beneficial, 4: moderately beneficial, 5: strongly beneficial.

For each benefit, 34-36 reviews were received. The arithmetic mean of these responses is shown in Figure 13.

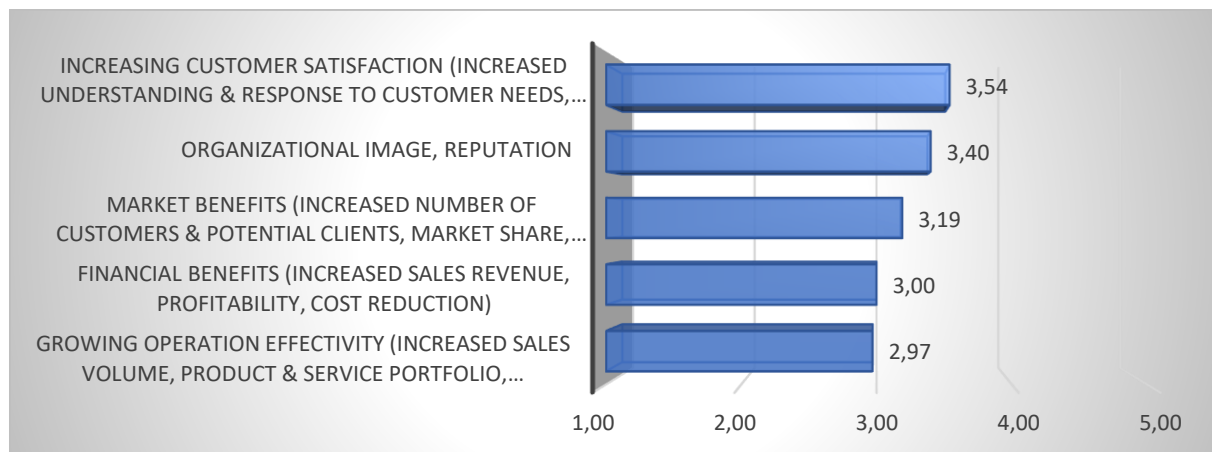


Figure 13 Benefits realised from customer-centric innovations (arithmetic mean of answers in a 1 to 5 Likert scale)

Through the introduction of customer-centric innovations, companies have reached an advantage in all areas, albeit to varying degrees. The lowest mean value was 2.97, which has a somewhat beneficial, somewhat advantageous meaning. The greatest (medium) benefits were seen by companies in terms of increasing customer satisfaction, which goes hand in hand with an increase in the image of the organization. They perceived these benefits the least on the financial side and in terms of their operational efficiency. Based on these, they seem to have been less able to monetize the results of innovations involving customers, but customer satisfaction and the strengthening of the company’s reputation also pay off financially in the long run.

If we examine the realization of the advantages according to the size of the company, the advantages occurred to different degrees in each size category. (Table 9) Thirty-six companies answered the question, of which twenty were micro-enterprises, six small enterprises, three medium-sized enterprises, seven large enterprises.

Table 9 Benefits realised from customer-centric innovations by size of companies (arithmetic mean of the answers in a 1 to 5 Likert scale)

	less than 10	10-50	51-250	more than 250
Increasing customer satisfaction (increased understanding & response to customer needs. tailor-made/customised product development. better and faster communication with the customers)	3.55	3.00	4.33	3.57
Organizational image. reputation	3.26	3.50	4.00	3.43
Market benefits (increased number of customers & potential clients. market share. entering of new markets. global trade. geographic expansion. business linkages)	3.30	3.00	2.67	3.29
Financial benefits (increased sales revenue. profitability. cost reduction)	3.00	2.50	3.00	3.43
Growing operation effectivity (increased sales volume. product & service portfolio. productivity. quality. speed. reliability)	2.89	2.80	2.67	3.43

In general, in most cases a value between 3-4 can be found, which indicates a small to medium advantage. Financial benefits and operational efficiency benefits were perceived the least by companies. The colours in the table mean: green: higher than average. yellow: average. red: below average. Based on this, it can be clearly seen that large companies have on average achieved greater benefits in all areas through their customer-centric innovation. While in the case of the responding small companies in almost all cases the benefits were perceived to be below average. Microenterprises were closer to the mean values, which is not surprising since they were overrepresented in the sample.

If the realization of benefits by countries are examined, benefits have occurred and/or perceived to different degrees in each country (Table 10). Thirty-six companies answered the question, of which seven companies in Denmark, five companies in Germany, eleven companies in Hungary and five companies in Poland. (A further eight responses were received from four additional countries, which are ignored here.) The green fields in the table indicate above-average values, and the red fields indicate below-average values.

An interesting result is that Danish companies rated the benefits of customer-centric innovations more pessimistically than average in all areas. Polish companies rated the financial benefits as the smallest, but also found the increase in customer satisfaction to be smaller than average. German and Hungarian companies perceived the benefits in all areas more than average.

Table 10 Benefits realised from customer-centric innovations by countries (arithmetic mean of the answers in a 1 to 5 Likert scale)

	Denmark	Germany	Hungary	Poland
Increasing customer satisfaction (increased understanding & response to customer needs. tailor-made/customised product development. better and faster communication with the customers)	3.14	3.60	4.18	3.00
Organizational image. reputation	2.57	3.60	3.70	3.60



Market benefits (increased number of customers & potential clients. market share. entering of new markets. global trade. geographic expansion. business linkages)	2.43	3.80	3.64	3.40
Financial benefits (increased sales revenue. profitability. cost reduction)	2.57	3.60	3.30	2.80
Growing operation effectivity (increased sales volume. product & service portfolio. productivity. quality. speed. reliability)	2.43	3.60	3.20	3.00

### Barriers to the introduction of customer-centric innovations supported by digital tools

Finally, it was examined what companies see as key barriers to the introduction of customer-centric innovations supported by digital tools. Obstacles were classified into six major groups:

- Financial barriers (high cost and investment needs regarding hardware, software, networks, trainings, organisational changes)
- Unclear return of investment (difficult to measure the added value, lack of objective information regarding the benefits and costs of ICT, too much risk)
- Lack of information, knowledge, and digital skills (lack of professional human resources)
- Lack of corporate resources (lack of appropriate knowledge-based assets, technological capabilities)
- Lack of trust in the use of ICT (Risks in protection of intellectual property and digital rights, challenges in terms of digital security and privacy)
- Lack of organizational ICT culture
- Lack of willingness to use digital tools by our target group

Respondents were able to rate on a Likert scale of one to five, the extent to which each factor hindered the implementation of customer-centric innovation. Numeric values have the following meanings: 1: not challenging, 2: slightly challenging, 3: somewhat challenging, 4: moderately challenging, 5: strongly challenging. For each barrier 34-35 ratings were received. The arithmetic mean of these responses is shown in Figure 14.

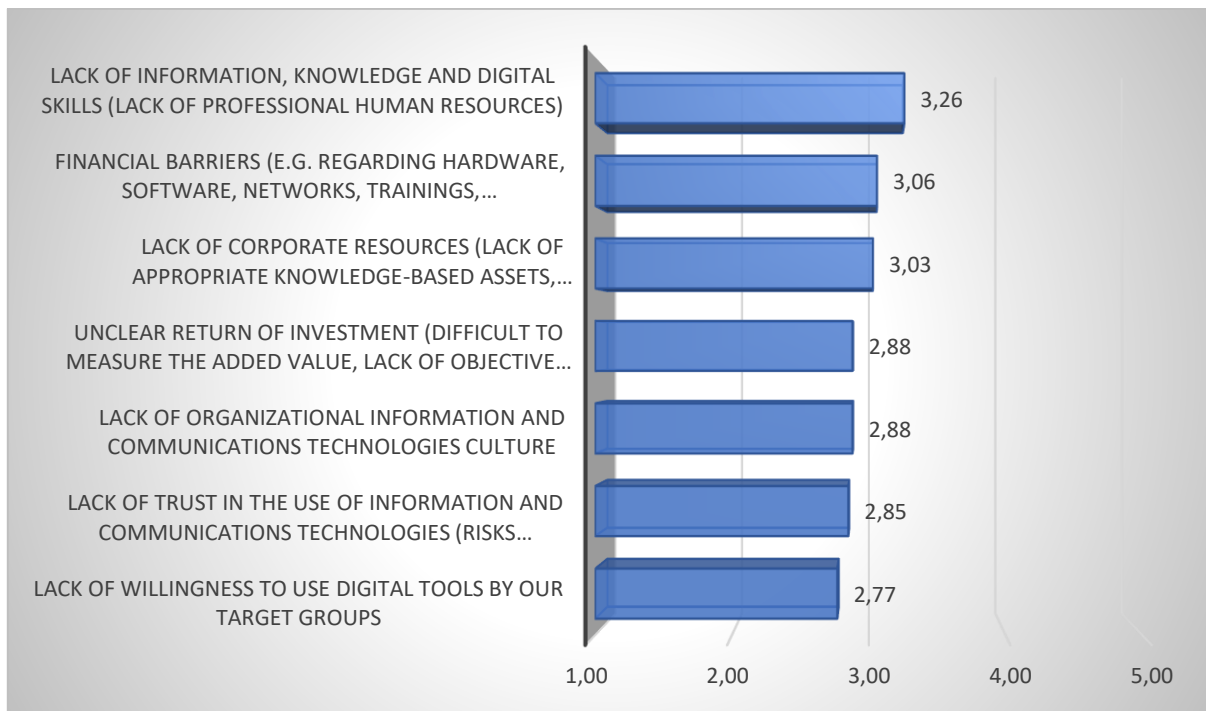


Figure 14 Barriers to the customer-centric innovations (arithmetic mean of the answers in a 1 to 5 Likert scale)

It is an encouraging result that the implementation of customer-centric innovations supported by digital tools has not encountered any significant obstacles in almost any field. For respondents the lack of digital skills and knowledgeable professionals was the most aggravating factor, but received an average score of 3.26, which is a less than moderate challenge. Financial and resource barriers followed in the order of their strengths. These results confirmed our expectations. In many cases, SMEs face with the problem of insufficient resources and financial resources. Uncertainty on return on investment, organizational ICT culture, mistrust of digital solutions, and customer acceptance of digital solutions were less problematic among responding companies.

The difference in perceived barriers by firm size were examined (Table 11). Thirty-six companies answered the question, of which twenty were micro-enterprises, six small enterprises, three medium-sized enterprises, seven large enterprises.

In general, in most cases a value between 2-3.6 can be found, which is a small to medium value in judging the challenges. The colours in the table mean: green: below average, yellow: around average, red: above average. Based on this, surprisingly, it appears that large companies in all areas have on average faced greater challenges in implementing customer-centric innovations. These challenges were also better perceived by micro-enterprises, which in turn could be expected. Small and medium-sized companies were more positive about the challenges.

Table 11 Barriers to the customer-centric innovations by size of the company (arithmetic mean of the answers in a 1 to 5 Likert scale)

	less than 10	10-50	51-250	more than 250

Lack of information. knowledge. and digital skills (lack of professional human resources)	3.44	2.67	3.00	3.43
Financial barriers (e.g. regarding hardware. software. networks. trainings. organisational changes)	3.26	2.50	2.67	3.14
Lack of corporate resources (lack of appropriate knowledge-based assets. technological capabilities)	3.22	2.17	2.33	3.57
Unclear return of investment (difficult to measure the added value. lack of objective information regarding the benefits vs. the costs. too much risk)	3.11	2.00	2.33	3.29
Lack of organizational information and communications technologies culture	2.94	2.67	2.33	3.14
Lack of trust in the use of information and communications technologies (risks regarding protection of intellectual property and digital rights. challenges in terms of digital security and privacy)	2.89	2.67	2.00	3.29
Lack of willingness to use digital tools by our target groups	2.84	2.83	1.67	3.00

Table 12 Barriers to the customer-centric innovations by countries (arithmetic mean of the answers in a 1 to 5 Likert scale)

	Denmark	Germany	Hungary	Poland
Lack of information. knowledge. and digital skills (lack of professional human resources)	2.86	3.4	3.7	3.75
Financial barriers (e.g. regarding hardware. software. networks. trainings. organisational changes)	2.71	2.8	3.5	3.4
Lack of corporate resources (lack of appropriate knowledge-based assets. technological capabilities)	2.57	2.8	3.9	2.75
Unclear return of investment (difficult to measure the added value. lack of objective information regarding the benefits vs. the costs. too much risk)	2.43	2.6	3.3	3.25
Lack of organizational information and communications technologies culture	2.29	3	3.8	2.5
Lack of trust in the use of information and communications technologies (risks regarding protection of intellectual property and digital rights. challenges in terms of digital security and privacy)	2.43	3.2	3.5	2.75
Lack of willingness to use digital tools by our target groups	2.57	3.4	3.09	2.75

The obstacles to introduction of customer-centric innovation appeared and/or perceived to different degrees in each country (Table 12). Thirty-six companies answered the question, of which seven companies in Denmark, five companies in Germany, eleven companies in Hungary and five companies in Poland. (A further eight responses were received from four additional countries, which are ignored here.) The green fields in the table indicate below-average values, and the red fields indicate above-average values.

Danish companies faced less challenges in implementing their customer-centric innovations supported by digital devices. (It is true that the benefits were also less perceived.) German and Polish companies faced difficulties more than average and partly less than average. It is important to point out that in the case of Germany the order in which the difficulties are rated is different. Based on the respondents' assessment, consumers' ICT receptivity, lack of trust in ICT solutions, and organizational ICT culture were rather challenging than lack of financial resources, uncertainty of return, or companies' resource supply. The implementation of these innovations was the most challenging for Hungarian companies, they considered the obstacles to be stronger than average in all areas.

### **Best Practices in the use of digital technologies supporting customer innovations by SMEs**

Source:

- Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics, Erika Szilágyiné Fülöp, Ádám Bereczk: Experiences of Best Practices in the use of digital technologies supporting customer innovations by SMEs, 2021

#### **About the research**

To address this problem, this report provides an insight into aspects of the use of digital methods for the identification, processing, and implementation of customer-centric innovations in SMEs. In addition, selected best practices of customer-centric innovation activities are elaborated. We have 37 best practices from 12 countries.

#### **Examples of products or services co-created with customers**

Because of the small number of case studies the good practices cannot be compared by countries, company size, and sectors. It is not possible to draw a correct conclusion for such a small number of items. Rather, we can say that the application of customer-centric innovation can be applied successfully in many areas. It is particularly prevalent in areas where personalized (customized) products and services have higher importance.

It can also be seen from the cases that the products and sectors are very diverse. Generally, can be concluded that success can be reached in almost all areas in customer-oriented innovation, regardless of the size, scope, or location of the companies.

In the case studies examined, customer-centric innovation was applied to products such as:

Recipes, DIY-Story cards, Calendar, Meal planner

Beeswax wraps

- Sustainable jewellery
- Construction toys
- Customised and sustainable skin care, sustainable cosmetics, personalised skincare routine,
- Fair fashion and living accessories
- Design homewares and furniture
- Image design editor
- Sustainable water bottles, personalised inscriptions and prints onto water bottles, personalised product packaging
- Platform which develops new add-ins
- Power tools and hand tools for the construction, manufacturing and woodworking industries
- Realway services, travel, logistics and rolling stock maintenance
- Postal service
- Prepare the apartments for sale and we refurbish apartments
- Payment Service,
- Special wall and ceiling decoration, digital wallpaper design activities.
- Water, gas heating installation
- API platform that allows to build customized payment solutions
- A retailshop for eyes control and selling glasses. Glasses, (star) binoculars, control/eyes check, contact lenses and can offer services from an eyes-doctor.
- Informatics, software development
- Digital banking software
- Manufacture of medical devices
- Operation of hairdresser saloon

However, good examples of customer-centric innovation may not only appear at the product level. Other server processes such as sales, website, delivery can also be made simpler and more efficient by using consumer feedback. In other words, the efficiency of corporate operations and the complex process of customer service can be made more efficient through consumer feedback.

#### **Redesign of webshop and faster delivery option**

*„Another example where the customers were heavily involved was **the redesign of her web shop**. The layout and categories were completely restructured due to customer feedback to accommodate their needs and wishes. For instance, the products were restructured according to the product type, rather than according to collections as it had been the case prior to the redesigning process. Another change happened to the check-out process where customers can now add personalised features separately which makes the check-out process easier. The company continuously asks customers for feedback to be able to offer the best possible products and services. Due to the increasing international demand for her products, the company reached out to DHL to add another, **faster delivery option** especially for international customers.”*

**New Vintage by Kriss, a jewellery company, Estonia**

#### **Providing a high-level service in terms of efficiency**

*“Over the last few years laRinascente has carried out a progressive restructuring of the shops in the name of design, with the opening of new avant-garde stores and a continuous updating of the product offer.” “The customer must*

*be given a high-level service in terms of efficiency, accessibility of the various payment methods and customer recognition.”*

**La Rinascente, Italy**

**Improving the overall customer experience and business operations**

*„The company made significant changes to the ways it interacts with customers **to improve the overall customer experience and to help improve the business operations** as a whole. Thus, it redesigned, restructured and modernised “all passenger traffic ticket sales systems and channels for both commuter and long-distance travel”.*

**VR Group, Finland**

**Technology development – finding new solutions**

*„We continually face with new demands of the clients. They wish to have this technology used in places where there’s a high level of strain or even in their bathroom. This has made us find out new solutions. There are clients who wish to have certain decorations outside, on the walls of their houses. This is a new demand and we try to find a suitable technology to satisfy it.”*

**IFresco, Hungary**

**Platform for freelancers**

*„The best insight comes from outside. Our mission is to facilitate a community, which works for everyone. Freelancers have access to a **buzzing project bazaar**, and companies can fulfill their business goals with the right people, handpicked specifically for their needs. We created a platform, where complex goals are made simple. This is a place where freelancers unite and join forces, so businesses can experience solutions like never before. Because diverse mixes bring unique solutions.”*

**Briefly, <https://briefly.work/about-us-en>**

**Methods of customer’s involvement in innovation processes**

Companies can choose different methods to involve their customers in innovation processes. E.g.:

Surveys/questionnaires

Interviews

Focus Groups

Brainstorming

Observations (customers are observed in daily life personally)

Test Groups

Field Test (testing products and/or services in real life circumstances)

Simulations and visualizations

Living Labs (Cooperation with customers in company’s laboratories and workshops)

Diary Search: (target groups are asked to write the product and/or service experiences in a pre-structured online diary)

others



The most common method of involving customers is conducting interviews, surveys, and questionnaires, which are relatively easier to implement and better known, especially among SMEs. The companies use more of the digital communication channels used for communicating and collaborating with customers at the same time. The highest proportion was the use of e-mail, which was followed by the use of social media (Facebook, Instagram, Pinterest, Twitter, Youtube). In addition, the use of online advertising (Google ads, Instagram ads), an interactive website, and Q&R are mostly mentioned. The use of novel tools such as chatbots, support teams, or gamification tools is present, but in a rather minor proportion.

#### **E-mail, phone**

*„In general, in the area of services, we contact the customers on the phone, via email, but above all in person. Based on the orders we can receive information, again electronically, about the products, spare parts, and the necessary new tools.”*

**Földvári, self-employed, Hungary**

#### **Social media**

*„In terms of social media presence, DHL is active on several platforms (e.g. Facebook, Instagram, Twitter) and shares a mix of personal stories from employees and new products and services, but also offers quick and simple customer service through a customer support account on twitter, for instance (@DHLPaket, @DHLexpress, @DHLPaket).”*

**DHL, Germany**

*„To cooperate with consumers in the field of innovation, we primarily use: Website, Facebook, You Tube, Instagram, Blog, E-mail communication.”*

**OMEGA, Poland**

#### **Social media and company website**

*„Another way of reaching out to her customers is through social media. For instance, the company often uses Instagram to receive quick and direct feedback from customers, e.g. in the form of short question and answer options on Instagram, or through short questionnaires. She encourages customers to share pictures of the jewellery and shares the stories behind certain pieces of jewellery on the company’s Instagram and her website. This way she involves her customers in the design of a product or, more recently, in the design of the company’s website. Another way in which Kriss uses social media to engage her customers in the design process is by giving the customers a few options in a product’s design and letting them vote on which one they like best or encouraging them to name a product, which is always a fun process for all involved. She also engages with customers via email and in her store.*

**New Vintage by Kriss, a jewellery company, Estonia**

#### **User survey**

*“The OmaPosti concept is based on a comprehensive user survey that interviewed over 50 users, charted their aspirations, and learned about their real needs. The service is constantly being developed and validated according to the needs of the users so that each new concept and feature will provide the best possible user experience.”*

**Posti, Finland**

### Digital guest book

*„We have a digital guest book and write into it the date and the type of hairstyle we made to the customer. We have been keeping this digital guest book for years now, thus we know about each of our customer when we dyed her/his hair, what type and colour of dye we used and what was the hairstyle.*

*This way we become familiar with the customs of our clients, the materials used in his/her case. It is also beneficial for us because this way I can avoid buying paints and materials that nobody wants.”*

**Berendi Hair @ Academy, Hungary**

### Electronic drive interface

*„When I receive a concrete order from a client, when I make and/or refurbish an apartment for a customer, I create an electronic drive interface for each of my future apartment owners where I upload the apartment layout, photos, the electricity and furniture I recommend, together with the recommended tiles, doors, windows, lamps, etc. thus the customer can choose from them. All the respective information is on a dedicated drive library specific to the property.”*

**PkHome Kft, Hungary**

In some areas where tailor-made and personalized products are more important, or for smaller companies, in addition to online and traditional offline methods, face-to-face encounters may be the most inspiring methods in product development.

### Uses customers’ stories as inspiration - conversations with loyal customers

*„New Vintage by Kriss uses customers’ stories as inspiration for jewellery pieces. „Each design has a story behind it, something that moved, encouraged or touched us.” The company uses customer-based innovation by having conversations with loyal customers about their wishes and expectations for new products. Kriss believes that owning a small company is an advantage for customer contact and customer-centric innovation as it makes direct contact to customers easier. She is often able to meet customers in person at her design studio or on sales trips. Being a small company means that Kriss can accommodate clients’ wishes better and sometimes, for example, can add a specific symbol or engraving to her design. Often, designs come out of personal conversations with customers and the small size means that Kriss has the time to connect to different people on a more personal level.”*

**New Vintage by Kriss, a jewellery company, Estonia**

Varkki also designs its products with customer input. and uses personal conversations with loyal customers for their innovation process.

**Varkki, a sustainable fashion design company, Estonia**

### In person consultation, holding events and social media

*„The company makes an effort to engage with its customers through several means, both online and in person. The company regularly holds events on a variety of topics that are of interests to its customers. The store also offers personalised makeup and cosmetics consultations in their store and, due to the pandemic, also online through video calls or photos. This allows them to provide the customers with the best possible shopping experience and product choice. The company also runs an online shop and tries to adjust their collection according to customer demands. A big part of their business strategy is using social media to interact with their customers. The company is very*

*active on Instagram and regularly does live streams where they present new products and sales and interact with their customers. They also offer services such as customised advent calendars.”*

**Werte Freunde, Germany**

Gathering customer feedback is not in itself an innovation. Another important step is when the received consumer opinions and experiences are built into product/service development or to make operational processes more efficient.

**Incorporate customers feedback into product development**

*„We receive suggestions as to which products and aspects of the products are particularly important to the customers. Thanks to the direct and rapid feedback, these are actually incorporated into product development.”*

**mamiblock Shop, Germany**

**Incorporate customers feedback into product development**

*„One example of a product that was innovated or rather iterated through the input of customers are the beeswax wraps. After GAIA had received comments on their Instagram profile that the wraps size should be bigger repeatedly (10 comments), they actually changed the size.”*

**GAIA, (Trade) Germany**

In the case of individual, personalized products, it is often the case that a product, proven form, design, or technical solution for a customer is later incorporated into the wider product range, using its experience.

**From custom-made items to overall market**

*„The custom-made items often also make their way into the wider collection and are then sold as ‘regular’ products.*

*”*

**New Vintage by Kriss, a jewellery company, Estonia**

**From custom-made items to overall market**

*„As for churches, we must mention the church in Ipolynyék, Slovakia. A local painter had been instructed to paint the church, so the interior decorations were made by him. But the dome seemed to be a bit more difficult. So, I modelled it on a gym ball. Here we also carried out a 200m2 ceiling design. Incidentally, this work has brought a new product to be sold in the market soon.”*

**IFresco, Hungary**

**Solutions from different fields could be standardized and synthesized into one software and sold on the market**

*„The companies approached us for the purpose of process development and based on the experience gained together during this time, we recognized this market need, an innovative idea. Demand process solutions from different fields could be standardized and synthesized into one software and we can sell this to other companies in the market.*

*Steps of the customer-driven innovation process:*

*1. Situation analysis of previous clients, identification of processes*

2. *Defining automated processes*
3. *Define user requirements*
4. *Based on the user requirement, the requirement of the new IT system is created*
5. *Software development*
6. *Sales of software supporting standardized processes*
7. *Software adaptation for the new customer”*

**FlexInform Kft., Hungary**

Getting to know consumers and their behaviors, habits, needs, and preferences, and the increasingly conscious use of information is an important element of marketing strategy. A higher level of use of information collected from customers is the use of digital methods, such as data analysis, or the use of algorithms and applications to better identify consumers and their preferences and to personalize and target marketing communication tools.

#### **Customer community and data analysis**

*„Through the various channels in place for customer feedback and innovation through customers, GALIA has grown a sustainable customer community. With the help of data analysis, GALIA knows exactly who the customers are and what kind of people are reached through their online marketing strategies. GALIA has formulated a clear target group which helps them deciding on different marketing and customer strategies. Furthermore, they aim to keep their already established customers instead of focusing only on new customer acquisition.”*

**GAIA, Germany**

#### **Customer Solution and Innovation (CSI)” system**

*„The company established a “Customer Solution and Innovation (CSI)” system which is both a primary contact for customers and additionally also closely analyses and monitors customers’ needs and satisfaction. On top of that, the company has three innovation centres: one in Germany, one in Singapore and in the USA (Illinois) where customers can discover new trends and innovations and engage with them, but also present their own, personal challenges and issues. It is also important to highlight, that DHL is aiming to receive feedback and customer inputs at a variety of locations to enable a diverse customer group to be involved in the innovation process.”*

**DHL, Germany**

#### **ICT, customer loyalty program, CRM and data analysis**

*„ICT supports the marketing-oriented activities that come into play when the customer is not inside the store and that are used to communicate and let him know what is happening inside our stores. This is why we are committed to carrying out a customer loyalty program, through action on the checkout, CRM and data analysis, to give the consumer an integrated and personalized communication based on his interests.”*

**La Rinascente, Italy**

#### **Use of an algorithm based on the skin profiles and customers’ feedback**

*„Noie allows customers to subscribe to a customised skincare subscription service. Customers do the “Skin Test” and create a unique skin profile which is then analysed and matched with the best skincare routine and products from Noie’s range. The company has accumulated data from over 60,000 people and has created an algorithm based on the skin profiles and customers’ feedback. Customers are further able to adjust their skin profile and*

*thus their products and skincare routine any time and have the chance to get their money back should they be unhappy with the results. The company relies on customers to continuously provide them with data which is then reflected in the offered products and services. Most of the company’s communication with its customers is done online through its website and the personal customer profiles. „*

**Nøie, Denmark**

#### **Skin profile through a personalised online test**

*„The company offers a skin test where customers can find out their specific skin type through a personalised online test. In addition to their online skin test, the company also offers personal online chats on their website and video call consultations to provide each customer with the best personalised shopping experience and best suitable product.”*

**Manilla, Lithuania**

#### **Insights Forum – customer community - Big Data, CRM, and social media analytics**

*„DEWALT launched the DEWALT Insights Forum, which offers customers the opportunity to provide feedback and to submit ideas for products. The community has over 12,000 members and is made up of its partner Vision Critical, as well as, customers, partners, employees, fans, donors, and alumni. Using an Insight community, DEWALT gets rapid and ongoing feedback that allows them to make easier business decisions. More specifically, the insight community allows DEWALT to engage with customers in an ongoing dialogue that respects members individuality and their humanity...”*

**DEWALT, USA**

#### **Digitalisation and modernisation**

*„Due to the increased modernisation and digitalisation, the company can now continuously collect data on its customers and how they use its services which then helps with improvements and innovations.”*

**VR Group, Finland**

#### **Applications for learning about end-users**

*„Nowadays, there are plenty of suitable tools available during development to learn about end-user needs, of which perhaps the following 3 applications are what we come across often in our projects:*

***Zeplin** is a designer tool that facilitates group work within the company between the designer and the development team, as well as common processes and communication with the customer (viewing visuals, commenting). The finished design plans can be placed in the Zeplin, which is easy to comment on, so even selected end-user groups can be easily involved in the design process.*

***Figma** is also a designer tool whose best function is to allow live, real-time collaboration with a selected group of customer representatives and even end users, thus speeding up and facilitating the implementation of appropriate user needs and opinions during development.*

***Invision** is the perfect tool for putting together validated design elements to build a workable MVP (Minimum Valuable Product) that allows you to initiate approval processes and test finished user interface designs for either the customer or end users without starting application development. would be.*

**W.UP, Hungary**



There are companies that use multiple methods to engage their consumers, combining offline and online methods. Although no general conclusions can be drawn, the results of our survey show that more complex, organized solutions for customer involvement are typically used by larger (primarily large and medium-sized companies) and more mature companies. Also, an important question is whether companies categorize their customers based on their needs or expertise when involving them in the innovation process. This is an important issue because different types of feedbacks and experiences can be incorporated in the case of different customers. Different kinds of information can be obtained from lay customers and from professional users in the product development process. Both kinds of information are extremely useful.

The widest range of tools for consumer involvement has been observed in the practice of one of Norway’s leading food companies. In addition to surveys, the methods of focus groups, laboratory, and home testing, among others, are used. In addition, the categorization of consumers can be observed. They differentiate between lead users and professional users from end-users in their involvement in innovation processes. It is important to emphasize that the company also realizes significant and continuous benefits through the introduction of customer-centric innovations (see later). In addition to market (domestic and international) and operational advantages, they also achieve remarkable results from a financial point of view.

**More complex, organized solutions for customer involvement - combination of the methods - Categorizing consumers based on their needs and expertise**

*“In an industrial enterprise like this, there are a number of fairly common methods used to obtain information about customers and markets. Surveys and focus groups are often used to get feedback from customers. Perhaps more interesting is the combination of these methods with direct involvement of users, for example: focus groups where participants get to taste and evaluate new products, and where they can also be asked to explore new products in use in the kitchen  
taste panels in sensory laboratory for scientific testing of users' response to different product variants  
survey / home testing of new products to learn how consumers use new products, and how the product fits into the consumer's cooking and eating habits In addition, professional and industrial partners and customers are often involved in several phases of the innovation process: Chefs, as an important group of «leading users», from the Department of Gastronomy (now the Culinary Institute) and from various renowned restaurants, as well as experts from Matforsk and the university community at Ås, are often used for advice and participation in product development. Industrial partners and customers, from retail chains to industrial producers of ready-made food and other foodstuffs, often participate in the formulation of new needs and in the development of new concepts, products and technical solutions.” Data collection about customers in case a project was done in several rounds. Early in the project, the team conducted a study trip to potential market regions. Italy, Belgium, Korea, Japan, etc. were visited to learn about their food cultures, market and distribution structures, etc. Later, when the technology was better developed, they conducted more conventional market studies, using focus groups and home testing of the product in a number of Norwegian home. Finally, a number of marketing and sales promotions provided important learning in direct interaction with potential customers.”*

**TINE, Norway**

In addition to the practice of the Norwegian company, we can also highlight the example of a Hungarian software company and a medical device manufacturer company in terms of combining and applying the methods in many ways. An interesting moment in the case of a software company



is that the head of the company highlighted as an important aspect that their own employees look at their products from the customer's point of view and use their own needs in product/service development, as they can be considered customers. They themselves use these services.

**Combination of methods - working team as customers**

*„We use several methods to involve customers, depending on the expectations of our customers. Most often, we use UX research methods, which are performed either by our company or by the customer, otherwise by a third party. During the developments, in addition to the research, we also got our own and our acquaintances' experiences, on the basis of known user market knowledge, and on opinions available on freely available social media interfaces.*

*Also a few examples without claiming completeness:*

**UX Research:** *Knowledge of the operation of the market, users and competitors, collection of information and adaptation of this information in the design phase. Examples of solutions used include user interviews based on online research, ethnographic research and market research methodologies, the main purpose of which is to understand the real needs and difficulties of end users during design, to understand their thinking and to be able to design a solution to them.*

**Service Design:** *Optimizing the usefulness of the service for the user by involving the customer. This optimization feeds on UX research, user reviews, and marketing research to deliver the most optimal solution for the customer. Solutions used include service scope and customer journey map.*

**User Experience Design:** *Maximize the usability of the service for the user, with the goal of achieving a perfect user experience that is mapped based on UX research. In each case, the completed sub-plans are tested with different user groups, the results of which are continuously traced back during the development process. Examples of solutions used are information architecture, user personas and usability testing.*

**User Interface Design:** *User Interface (UI) Design - Facilitate the user-friendliness of the service by using the appropriate design elements based on the above research and current trends. Solutions used include emotion design and design guideline.*

*In addition, it is important to highlight the use of ideas within your own team as customer needs. We are all users of such applications in our private lives, so ideas within a team are customer-side innovations, with the difference that perhaps our ideas and opinions are not typical customer opinions, as we look at these products with a slightly different eye due to our work.”*

**W.UP, Hungary**

**Combination of methods - Categorizing consumers based on their expertise**

*„We conduct a direct clinical trial involving partners who use the product and services. These data are collected under the supervision of an external CRO (Clinical Research Organization). The CRO plans of what factors (complications, implant loss) we will take into consideration during the research. Then a bio-statist will determine how many people need to be involved in the process. The research leader collects the data and writes the research report. If there are any problems, we will incorporate the solution into the improvements. Doctors are approaching the company with the intention of development, they have an idea and would like us to implement these, which will happen based on the following process.*

- 1. Defining user requirements*
- 2. the system requirement is created based on the user requirement (technical-engineering data)*
- 3. product design*
- 4. prototype production + verification*

5. series production + verification

6. validation before the product goes on the market.

**Methods used to involve consumers:**

*focus group, in-depth Interview, brainstorming, customer satisfaction questionnaire, product lifecycle monitoring, simulation, Collaboration with external laboratories to perform tests, recording a complaint, recording unexpected events, gaining application experience, equivalence test.”*

**Bionika, Hungary**

**Difficulties in involving customers**

When implementing customer-centric innovations, companies face a number of difficulties in engaging customers. The following difficulties can be identified in identifying the needs and experiences of customers and in communicating with customers: Involving consumers is time-consuming and financially resource-intensive (infrastructure, technology, IT). It is sometimes difficult to identify customers who can provide innovative ideas during the innovation process. In addition to these difficulties, companies face the problem that their customers are not motivated enough to give feedback to the company. To increase the willingness to provide feedback, it is important to encourage consumers. Such a tool could be, for example, when it builds on the emotions of consumers. (see, for example, Gaia’s motto “We want to learn from you” or developing a sense of “belonging to a community”). Another way to encourage consumer feedback is to generate financial interest from consumers, for example by introducing coupons, vouchers, giveaways, idea contests, or consumer loyalty programs, or even securing a percentage of sales for the best ideas.

**„We want to learn from you” – voucher**

*„GAIA is applying various methods to engage with their customers and to achieve customer innovation through that. They are doing a combination of offline and online strategy. Their offline strategy includes a little leaflet that is added to the customer’s purchase with the call “we want to learn from you”, so basically an invitation to give feedback on the shopping experience and the product. To motivate the customers to actually give feedback and reviews, they receive a voucher of 15€ for their next purchase. This strategy plays into a lesson learned by GAIA – a company should not only focus on the acquisition of new customers but really invest in the relationship with the already established customers. GAIA mostly works with standardized questionnaires to collect customer feedback. Another method in order to receive customer feedback for innovation is the offer to apply to become a product tester for GAIA’s products.”*

**GAIA, Germany**

**Loyalty programme**

*„Customers are involved by using mainly digital tools through which the company collects customer feedback. This is done, for example, through social media and in stores. The company also has a loyalty programme for its customers which they use as a means to stay in touch with their customers. Additionally, they offer the option of a personal shopper where a customer can get help with the purchase of a product. Through these various interactions with their customers, the company collects data on the customers’ needs and wishes and adapts its services and product range accordingly. „*

**La Rinascente, Italy**

**Refer a friend” option with a discount**

*„Additionally, the company offers a “Refer a friend” option which allows both the existing and the new customer a €14 discount on their next shop.”*

**Noie, Denmark**

**Community feeling - storytelling**

*„Kriss believes that the more customers are part of the creative process, the more the product becomes personal and gets a community feel. The storytelling aspect of her jewellery design connects the customers to a product and the company and creates relationships to a piece. The community feeling is also increased by the fact that customers from all over the world, from very different countries, all have similar stories and experiences which people share across cultures and borders and a piece of jewellery can connect them and can thus feel very personal. Connecting to customers during the design process also makes Kriss feel like she can give something back and does more than just create a piece of jewellery’ which is incredibly rewarding.*

**New Vintage by Kriss, a jewellery company, Estonia**

**Community feeling – share tips & tricks**

*„On top of that, Pixelmator has an online community, where customers can discuss the product, as well as “image editing, share tips & tricks, tutorials, and other useful resources, or just chat with other Pixelmator users”. Users can also request new features which are then taken into consideration and may be added to the editor. The company also has a strong social media presence where it interacts with its customers and regularly shares tips on how to use its editor.”*

**Pixelmator, Lithuania**

**Design contests**

*„Additionally to their individual design process, the company engages with its customers through social media. The company regularly hosts design contests and allows customers to pick their favourite design from a range of choices which are then added to the collection. The company also runs a blog on social and sustainability issues and topics and posts about these on their social media platforms, as well.”*

**Sould Bottles, Germany**

**Online community - competitions of design ideas - financial motivation for the designers**

*„LEGO is a leading company in the area of customer-centric innovation. The company is making the most of being able to connect to their customers online by providing them with an online community. Customers and fans can submit their own design ideas which then get voted on and if a design receives enough support, the company reviews the design and may turn it into a product. The designer receives a percentage of the sales and is heavily involved in the whole process, thus rewarded for being innovative and for sharing their ideas and design with the company. LEGO uses a mix of social media customer mechanisms, such as highlighting customers’ ideas and reposting their social media posts, offering competitions, and replying to customers in a personal matter (e.g. @LEGO\_Group, @LEGOIdeas).”*

**LEGO, Denmark**

**Made Unboxed campaign – TalentLAB – design competition - Talent Award - financial motivation for the designers**

*„The company relies on customers to showcase its products through its Made Unboxed campaign which allows customers to share photos of a product in their home which then gets uploaded to the company’s social media and online presence. The company also has an online platform called the TalentLAB where customers can put down a deposit on an design idea they are interested in and if the design receives enough funds, the company will produce it and the customer who put down a deposit on the design will receive the finished product once it’s being produced. Additionally, the company has an annual design competition, the Made Emerging Talent Award, where anyone can submit a design idea and upload it to the TalentLAB platform. A panel of experienced designers then shortlists six products which are then voted on by the public, the customers.”*

**MADE.com, United Kingdom**

**Pleasure in creating for clients**

*„Modern technology meets handicrafts, where clients will be able to paint their pictures chosen, thus, they can take pleasure in creating.”*

**IFresco, Hungary**

**Benefits from customer-centric innovations**

More kind of benefits can be reached by companies through the introduction of customer-centric innovations. These can be divided into five major groups:

1. Financial benefits (increased sales revenue, profitability, cost reduction)
2. Growing operation effectivity (increased sales volume, product and service portfolio, productivity, product and service quality, speed and reliability of communications and transactions, positive change in business model and business practice)
3. Market benefits (increased number of customers and potential clients, market position, market share, entering of new markets, global trade, geographic expansion, business linkages, competitiveness)
4. Increasing customer satisfaction (increased understanding and response to customer needs, tailor-made/customised product development, better and faster communication with the customers)
5. Improving organizational image, reputation.

In most cases, market advantages were highlighted by companies in presenting their practices. With the involvement of consumers, the products/services offered by the company increasingly meet consumer needs, thereby increasing consumer satisfaction and brand loyalty, strengthening the company's market position, increasing the number of customers and sales volume.

**Improve of brand loyalty**

*„In addition, this also increases the acceptance of the products by the customers and thus sales and brand loyalty.”*

**mamiblock Shop, Germany**

**Improve of consumer loyalty**

*„On top of that, engaging directly and continuously with the customers also means that customers tend to stay with the company for a long time (some since the beginning) and that showcases the good quality of a product. These customers also tend to give good and honest feedback and also speak up if something is not up to standard which helps with improving the products and services in the long run. „*

**New Vintage by Kriss, a jewellery company, Estonia**

**Increase in number of users**

*„OmaPosti users increased by 50% during its first six months, and this number continues to increase.”*

**Posti, Finland**

**Increasing customer satisfaction**

*„The number of complaints was reduced to minimum.”*

**PkHome Kft, Hungary**

**Professional recognition**

*„We have gained wide professional recognition nationally and internationally.”*

**IFresco, Hungary**

**Increasing revenues number of costumers**

*„More customers due to a buzz marketing.”*

**Stolmar Zbigniew Marchwiak, Poland**

*„More customers and increasing revenues..”*

**ZPHU DARMEX Dariusz Wójtowicz Poland**

Positive feedback from other customers can in many cases motivate new customers, increasing confidence regarding the product/service and the company itself.

**Putting positive feedback as reference**

*„The feedback GALA receives from customers is sometimes put as a reference on their website or social media. Feedback is put publically on website and serves as a reference. Overall, the customer innovation methods go hand in hand with marketing and outreach strategies. Furthermore, this has huge impact on the market acceptance.”*

**GAIA, Germany**

The positive impact of social media can not only be direct, it can also have indirect benefits.

**Indirect benefit of social media**

*„It is interesting to point out that GALA has a lot of followers on Instagram (29.700) but only few of them actually purchase their products online. Many of them are following the GALA account for lotteries and to receive something for free. However, the social media is still highly valuable for customer feedback and market acceptance purposes, although the followers might not be the main purchasing power. When GALA reached out to collaborate*



*with a local supermarket, they could show that they have an impressive amount of Instagram followers, for example, which was very attractive for the supermarket.”*

**GAIA, Germany**

In addition to market benefits, a company can also increase operational efficiency by learning about and using consumer feedback.

#### **Increase of customer satisfaction and performance**

*„The company has also been publishing reports on customer-centric innovation practices and has reported a huge increase of both customer satisfaction and their on-time delivery performance. „*

**DHL, Germany**

*„Thanks to the involvement of customers at every stage of the design process, we are sure that the final product will be best suited to the customer's expectations and will meet his expectations to the greatest extent.”*

**AJ PROJEKT MEBLE, Poland**

#### **Simplifying and rationalizing industrial production**

*„User involvement in TI is often about simplifying and rationalizing industrial production for the customer, but also about contributing to the customer's development of new products. The typical pattern of user involvement in TI is based on continuous dialogue with their main customers, where the customer's needs can be expressed and understood. Sometimes this becomes simpler projects that TI solves on its own, while other times it becomes a joint development run through several phases.”*

**TINE, Norway**

#### **Improving customer experience and efficiency**

*„We have faith in digitalisation and new technologies in improving customer experience and efficiency as well as seeking growth through agile innovation.”*

**VR Group, Finland**

#### **Gaining knowledge, experience**

*„The advantage of W.UP also lies in the diversified experience and knowledge that our colleagues have gained over the years in the field of banking IT and customer service. Much of this knowledge is gained by actual customer feedback as well as our comprehensive market knowledge, which complements the results of the above methodologies and research.”*

**W.UP**

#### **Gaining knowledge, experience**

*„Do the customers, guest brings new ideas to us? Yes, if the requirements grow, more and more people are in search of a new type of service. For example, straightening the hair, and my colleagues learnt it. And I purchased the necessary tools. I will have more customers, I will earn more money. And the chances will be higher that my good employees will not leave me.,,*

**Berendi Hair @ Academy, Hungary**



However, the benefits in terms of market and operational efficiency are also realized in the long run in terms of financial benefits.

**Increase in total turnover - maintain leading position**

*„For the past 15 years, the company has included innovation as an increasingly important part of its overall strategy, both to promote a stagnant market for traditional dairy products, and to meet increasing national and international competition. Despite declining sales of milk from the 1990s until now, TINE has increased its total turnover every year, mainly due to continuous product development. TINE thinks strategically about product development and innovation at all levels in the organization. Thus, despite declining sales volumes, TINE has managed to increase its financial turnover and maintain its position as the leading (dominant) supplier of food in Norway.”*

**TINE, Norway**

**Better results – saving time and money**

*„This together: builds better products as DEWALT better understands how its products fit and function in the lives of their customers, provides better service, and delivers better results.”*

*“While traditional market research can be impersonal, time consuming and expensive, the DEWALT Insights Forum creates relationships with members and saves the company time and money. The company saved more than \$1 million in research costs in 2016 and almost \$6 million since establishing the Insight community. DEWALT can now use one resource for the entire lifespan of a project and once products have launched they can follow up easily with satisfaction and quality surveys (Dewalt, 2016).”*

**DEWALT, USA**

**More income and more investment into development**

*„Thanks to digitalisation, my company can use the time available for work much better, can provide the services for more customers simultaneously, thus has more income and thus invest more into development.”*

**Földvári, self-employed, Hungary**

**More orders from clients - increase in consumer confidence - increase in revenue**

*„One of our large clients worked with an external UX company on the projects, but as the workshops saw that our team understands the problems of the users better than the team they employ, they terminated the contract and we continued to do so. This change meant approximately a 5-10% increase in revenue over projects depending on the exact scope of the project.*

*For our other important customer, UX was not considered in an implementation project. We stressed the importance of this throughout the project and dripped them down from our expertise in this direction. For the customer, these ideas proved to be so good that UX elements were already ordered in the following projects in all cases, which also meant a 5-10% increase in revenue, depending on the exact scope of the projects.”*

**W.UP, Hungary**

**Reduction in resource need and costs – faster processes**

*„Benefits for the company: administrative costs have been significantly reduced, labour savings were realized, faster process turnaround time, there are no administrative errors.”*

**Bionika, Hungary**

It is important to mention that the benefits of customer-centric innovations also apply to customers, as the products better meet their needs and they are tailor-made.

**Benefits also at the partners of the company**

*„Benefits for the company: Revenue growth, market expansion, entering new markets, new customers. Benefits at our partners: administrative costs have been significantly reduced, efficient processes, utilization of the workforce's knowledge in other areas, faster turnaround times, fewer errors, more efficient use of working time.”*

**FlexInform Kft., Hungary**

**Conclusions and recommendation notes**

Based on the questionnaire survey and the results of the best practices, we can conclude that small and medium-sized enterprises operating in different fields use very different ways to involve customers in customer-centric innovation. Relatively simpler engagement methods are common, such as questionnaires, surveys, group or in-depth interviews, product career tracking, social media tools, various loyalty programs, or community-based experience gatherings. This is supported by the fact that both in the questionnaire survey and in the collection of best practices, more than fifty percent of the responding companies use these methods. While more serious customer involvement methods used for customer innovation, such as simulation, living labs, diary studies, are used by only a few companies, where the scope of activity is also based on more advanced technology.

*Table 13 Survey and best practices*

		<b>Survey</b>	<b>Best practices</b>
	<b>Total respondents (SMEs)</b>	<b>37</b>	<b>37</b>
1	Surveys, questionnaires	19	15
2	Interviews	21	23
3	Focus groups	3	11
4	Brainstorming	10	4
5	Observations (of customers in daily life)	16	12
6	Test groups	7	5
7	Field test (testing products and/or services in real life circumstances)	10	12
8	Simulations, visualizations	2	3
9	Living labs (workshops with customers in company's laboratories)	4	4
10	Diary studies (target groups write about product and/or service experiences in a pre-structured online diary)	1	2
11	Social media tools		19
12	Loyalty program, building community		16

We also tried to draw conclusions whether a difference can be found in the customer engagement methods based on the scope of activities of the companies. We were able to identify five main groups of best practices among small and medium enterprises such as construction, IT services, manufacturing industry, services, trade. But there is no significant difference in the field of customer involvement methods used. In each area of activity the methods used for customer involvement appear in different forms and mixed. There were about 6 SMEs in the field of IT services, manufacturing industry, services, where more serious methods also occur than in Observations (of customers in daily life), Field test (testing products and/or services in real life circumstances), Living labs (workshops with customers in company’s laboratories), Simulations, visualizations.

Table 14 Methods for involving customers

Field of activity	Main used methods for involving customers
<b>Construction industry</b>	Interviews, loyalty program, building community
<b>IT services</b>	Surveys, questionnaires Interviews, Focus groups, Observations (of customers in daily life), Field test (testing products and/or services in real life circumstances), Living labs (workshops with customers in company’s laboratories)
<b>Manufacturing industry</b>	Surveys, questionnaires Interviews, Focus groups, Observations (of customers in daily life), Simulations, visualizations, Living labs (workshops with customers in company’s laboratories) Diary studies (target groups write about product and/or service experiences in a pre-structured online diary) social media tools, loyalty program, building community
<b>Services</b>	Field test (testing products and/or services in real life circumstances), Surveys, questionnaires, Interviews, Focus groups, Observations (of customers in daily life), Simulations, visualizations, Living labs (workshops with customers in company’s laboratories), Diary studies (target groups write about product and/or service experiences in a pre-structured online diary), social media tools, loyalty program, building community
<b>Trade</b>	Interviews, Field test (testing products and/or services in real life circumstances) social media tools, loyalty program, building community

- Customer-centric innovation can be applied for companies independently from size. There are many ways to involve customers in innovation processes, from simple to more complex, more expensive solutions. Even the smallest companies can find the right and accessible methods.
- Customer-centric innovation can be successfully applied in almost any field. From manufacturing companies to service providers, we have found many examples of customer engagement and successful innovation. In high-tech sectors, or in areas where there is greater importance of tailor-made products, customer-driven innovation can be created easily.

- There are several options for mapping customer opinions/experiences/needs. The use of digital solutions, social media platforms, and data analysis tools greatly facilitates the collection and processing of customer feedback.
- Consciously learning about customer feedback and accurately identifying customers and their needs is helpful in developing a marketing strategy and product innovations.
- Getting to know customer feedback is not a customer-centric innovation itself. The knowledge and experience gained in this way must be integrated into the process of product development to be able to talk about innovation.
- The lack of motivation and interest of customers in the field of feedback makes it difficult to create customer-centric innovations. It is advisable to increase the willingness of customers to provide feedback and to create motivation. This could be, for example, the creation of a "sense of community", the impact on customers' emotions, or the creation of customers' financial interest, for example with coupons, discounts, loyalty programs, and idea competitions.
- Through customer-oriented innovations, companies can realize several benefits, that comes directly from the market position and operational efficiency, which also provide financial benefits to companies in the longer term.
- SMEs have little or no knowledge at all regarding customer-centric innovation and the digital opportunities that support it. Based on this, there is a great need for training that develops the knowledge and skills of SMEs in this field.
- From a management point of view, there is less bureaucracy for SMEs, quick decision-making and risk-taking due to entrepreneurial management, and an organic leadership style. At the same time, entrepreneurs often do not have formal management expertise, in which trainings like ours can be the solution.
- SMEs are fast and efficient in communication, have good informal contacts, but may lack time and resources, which may prevent them from developing an appropriate science and technology network. The creation and development of these types of networks and the involvement of SMEs can go a long way in overcoming time and resource problems.
- SMEs can respond quickly to the changing market requirements, they can effectively fill market gaps close to their activities through their innovations, while at the same time facing barriers to starting a foreign business due to high costs. The solution for this problem could be the development of (European) level support system for foreign market entry.
- The innovation advantage of SMEs is that they can employ technical staff in several company departments, but at the same time they have often lack of core technical expertise (it may be necessary to use external technical specialists) and miss the benefits of diversification of research and development.
- From financial aspect, lower innovation costs and higher R&D efficiency are possible for SMEs. At the same time, they face the risk of not being able to spread the high financial risks of innovation over several areas of activity, the difficulty of accessing external capital and the high risk of the cost of capital.
- SMEs can boldly take advantage of the sub-strategy (growth strategy based on specialization) (within a differentiation strategy), but growth can mean a difficulty by the use of external capital and entrepreneurs are often unable to manage growth properly.

- A major advantage for SMEs is that the regulations that apply to them are often less strict, but nevertheless, they are often unable to cope with the complexity of regulation, high adaptation and patenting costs mean difficulty.
- Many government programs support the innovation activities of small and medium-sized enterprises, although access to government programs and access to information can often be difficult. Due to the high costs, they may also have difficulties with cooperation programs.
- One of the key innovation benefits of SMEs is their ability to learn quickly, adapt and develop routines.
- The generally simple and centralized, organic form of SMEs should also be considered among the innovation benefits.
- SMEs can be attractive partners for innovation-oriented joint ventures/strategic alliances, especially if they are at the forefront of technology. However, the scarce management experience and subordinate position of power in cooperation with large companies are disadvantages in this respect.

## **Best Practices in the Transfer of Digital Skills and Technologies used in Customer-centric Innovations to SMEs - Experiences of Best Practices from Training Institutions**

Source: Ágnes Horváth, Noémi Hajdú, László Molnár, Anett Tóthné Kiss, Klára Szűcsné Markovics: Best Practices in the Transfer of Digital Skills and Technologies used in Customer-centric Innovations to SMEs. Experiences of Best Practices from Training Institutions

### **The aim of the research**

The aim of this research is to collect best practices from educational institutions that provide training for SMEs to develop digital skills and customer-centric innovation.

We sought to collect best practices from training institutions in 13 countries. The method was that of an interview, preceded in most cases by an email request. Interviews were usually conducted by telephone, and we used a set of prepared questions / templates to ensure comparability. There were several refusals during the surveys. Many educational institutions declined to be interviewed. This was partly due to lack of time and interest, but the most obvious reason was that the project was seen as potential competition. Due to the low willingness to respond, usable experiences came from 6 countries.

### **Research methodology**

We have 12 best practices from 6 countries. Most of the good practices collected were from Hungary and Hungarian educational institutions (5 in number). Three good practices were collected from Germany and one each from Denmark, Finland, Italy, and Poland. Regarding the type of educational institutions, among the organizations providing good practices there are 7 public institutions and 5 private organizations. Most of the public institutions are affiliated to a higher



education institution (e.g., IBC International Business College, Satakunta University of Applied Sciences, Technische Universität Hamburg, University of Miskolc), and among the private organizations we find mainly adult education institutions. Among the educational institutions, there are organizations that specialize specifically in SMEs (e.g., Mittelstand 4.0 Kompetenzzentrum Hamburg, Mittelstand 4.0 Kompetenzzentrum Kiel, Mittelstand-Digital Zentrum Hannover, t2i Technology Transfer and Innovation Scarl), but also those with a broader target group (students, trainers, consultants, companies, etc.).

### **Training for the SME sector is the topic of innovation, in particular customer-centred innovation**

Among the educational institutions surveyed, there are significantly fewer innovation training courses specifically for small and medium-sized enterprises. In many cases there is no such training offer at all, in some cases it is under development (e.g., ‘Currently being developed’ - Mittelstand-Digital Zentrum Hannover; ‘Currently, we do not have such type of training, but it would be very important to develop it since there is high demand for that type of training.’ – SZTÁV Felnőttképző Zrt.). However, in some cases the training institutions provide detailed training (e.g., ‘Innovation - marketing – competitiveness’ or ‘Research and innovation experts’ courses at Mentorius, Hungary). We can say the following about the topics covered in the training courses:

*‘Innovation - marketing – competitiveness’ course:*

- *Competitive advantages of innovation as critical success factors*
- *Re-interpretation of innovation activity*
- *Open innovations*
- *Product, process, organizational and market innovations*
- *Development of the optimal innovation portfolio*
- *Methodology of basic research and analysis.*
- *The role of technology and network competencies in innovation processes*
- *Success factors of innovation processes*
- *Cooperation, co-creation in innovation processes*
- *Innovation marketing and marketing innovation*
- *Lateral marketing technique for the development of new product ideas.*

*‘Research and innovation experts’ course:*

- *Technical, economic, and business knowledge: Lean 4.0, energy, advanced materials science and testing, quality in pre-development, technical trends, strategy and business planning.*
- *Research and innovation management knowledge: innovation and tendering systems, industrial property protection, innovation management, innovation methods, R&D&I project management, sustainability and innovation.*
- *Optional: Behavioural culture and conflict management, Additive technologies, Intercultural competence and team management, Integrated decision making and data management.*



## Module 4: Quality Function Deployment (QFD) and House of Quality (HOQ)

A company can have many goals, but the basic characteristic of successful companies is that they want to make a profit in the respective business by satisfying the needs of consumers. Corporate management must aim to identify these needs, create the means to meet them, develop methods to verify that the results are consistent with the original need, and have systems in place to enhance the organization's performance by modifying the tools necessary to ensure the quality of the product or service. To achieve this, QFD, or the house of quality method, can be a useful tool, with which we can get a comprehensive picture of the market's expectations, the technical factors affecting their satisfaction, the quality of the competitor's products, and help in determining the technical parameters of new products. The path leading from customer needs to the finished product is the product production process. It is important to note that the birth of the product is often the result of a confluence of random events. Although there is no doubt that there are many unpredictable and uncertain factors in the process, adequate quality of the production of a product is crucial for customer satisfaction hence the company's profit.

Planning the product development process is an important requirement. Due to lack of this we cannot be surprised if the goods do not meet the customer's expectations.

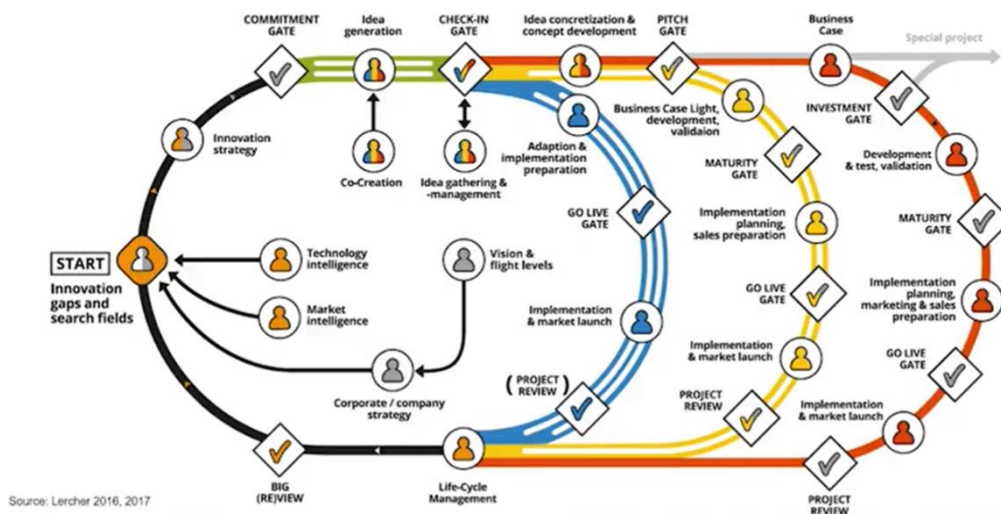


Figure 1 Acknowledging customer needs in line with the three basic paths of innovation process  
Source: Aachen University (MfL, 2022) based on Lercher 2016 and 2017

According to real life experiences, basically there are three alternative ways how an innovation process can unfold or be managed. Those three are depicted by the independent loops shown on Figure 1. All three cases have their unique points of the innovation management process that have their similarities. Those critical points are named “gates” and “review” points, where key milestones (or breakthroughs) should happen, or internal reviews are required about the process status. The key points mentioned are highly important for the efficient management or coordination of the innovation process. On the other hand, between those key points there are well-specified customer

requirement specific methods (such as co-creation, idea gathering or testing) which should be employed at certain stages of the different levels of innovation process loops. In practical adaptation of the model, one should decide which innovation loop is the most fitting for the actual case, then can follow the steps of the loop with confidence applying the methods required. (The methods are also specified in different parts of the teaching materials provided by the ICIInSMEs project modules.)

## **Role and place of the Quality Function Deployment methodology in the planning process**

The method known as QFD (Quality Function Deployment) was created in the 1960s. With this approach, the entire process of producing a product (from the initial consumer needs through the final product) becomes more transparent. When it comes to unstructured operations, the innovation path is difficult, full of dead ends, takes a long time, and can be very costly. Client expectations are altered throughout the changing processes, and in the meanwhile, the rival can find itself in a better position. In order to incorporate customer satisfaction into the service offering prior to production, Yoji Akao and Shigeru Mizuno utilized the tool for the first time in 1972 at the Kobe Shipyard in Japan when designing an oil tanker.

Till this day, wherever people work to meet the objectives and expectations of internal or external customers, QFD can provide useful support.

The goal of the QFD philosophy is:

- to meet the needs of consumers at the highest possible level,
- creating a bridge between customers and engineers,
- closing the gap between languages,
- enables product construction,
- planning production planning process,
- documentation tool, supporting post-analysis.

QFD can be used everywhere where objectives need to be achieved, while regulations should be followed, resources need to be utilized and processes need to be developed.

Key areas of utilization:

- development of products and services,
- further development and improvement of products and services,
- strategic and operational planning (ensuring transparency of interacting parameters and influencing factors, setting priorities),
- general analysis and designs, such as cooperation planning, rating measures etc.,
- process-oriented analysis, external and internal customer and supplier relations planning and implementation,
- planning the framework of criteria for business policy information, for example the development of company management guidelines,
- structuring tasks and assigning priorities by objectives,
- the use of QFD in all sectors and business areas.

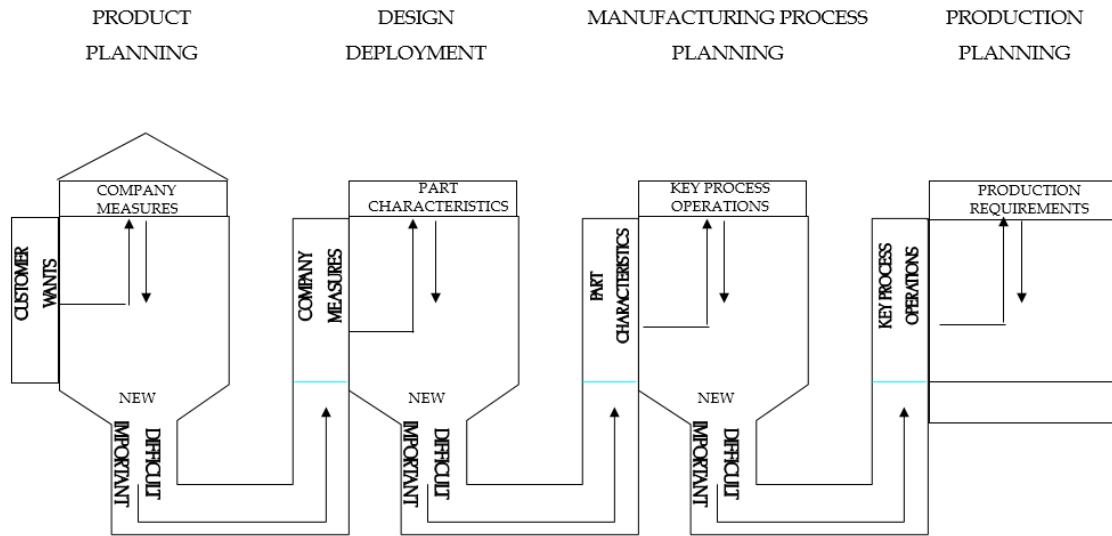


Figure 2 Phases of customer data implementation,  
Source: Cohen, L, 1995

On Figure 2, the subsequent phases of QFD implementation can be seen. Customer wants can be turned into product and production requirements while articulating clear company measures that can be interpreted well inside the company. Throughout the process difficult and important information is identified and prioritised.

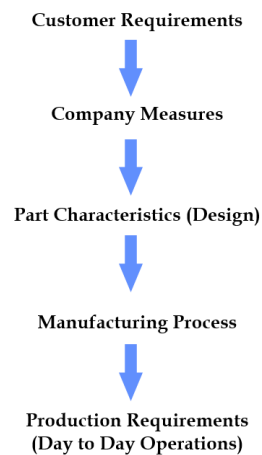


Figure 3 Basic steps of the QFD process  
Source: Master of Project Academy, 2022

## Designing QFD

Steps prior to designing the QFD:

- assessment of the customer's expectations,
- study of the customer's environment,

- examination of the products of competing manufacturers, etc.
- reviewing the results and other influencing factors.

QFD is a well-designed and well-articulated method where a matrix is used for depicting the different dimensions.

Parts of the matrix:

- List of customer needs during preliminary screening,
- Competitive analysis (how others satisfy these needs),
- Prioritization of customer needs according to their importance,
- The transformation of selected customer expectations into technical characteristics,
- Evaluation of technical characteristics according to customer needs,
- The triangle at the top of the matrix represents the correlation of the technical characteristics, all of them can be connected and examined here. A positive correlation means that the effects of the two technical characteristics reinforce each other, while a negative correlation means that the two technical characteristics work against each other, i.e. a compromise must be sought. Competitors' products help in this investigation, which shows what compromise they made and market acceptance shows how customers reacted to it. Steps required:
  - specifying the planned technical values,
  - ranking the technical characteristics according to market opinion.

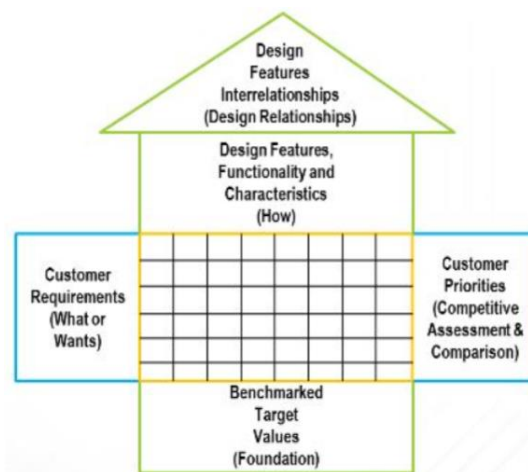


Figure 4 Basic elements of the QFD design  
Source: Master of Project Academy, 2022

### The elements of the “house”:

- The „We or What We Want”: customer requirements, needs and priorities forming the left wing of the house;
- The „Competitive Assessment”: compares the customer's priorities with the corresponding market offers for the most important competitive applications, which forms the right-wing annex of the house;

- The „How”: technical design features, functionality and features of the offer to meet the customer's needs. This forms the attic of the house;
- „Design Relationships”: Describes the relationships between the design features that make up the roof of the house;
- „The Base”: Uses benchmarked targets as objective measurements to evaluate the individual features that make up a home's basement.

## Steps for implementing the QFD method

In the followings we provide a systematic approach to the implementation of the methodology on a step-by-step basis. First looking at the main steps of the process, then describing a detailed method for creating the “house” in the proposed order.

The five main steps of implementing QFD are as follows:

1. Identifying customer needs,
2. Assigning technical specifications (such as the product specifications),
3. Laying down partial tasks (for example the component characteristics),
4. Specifying process attributes (for example technological processes and their characteristics),
5. Defining the quality control plan.

When following the steps above we need to keep an eye on the sequential framework of the information transformation levels of the execution process.

The main steps are easily understandable and following the sequence gives a quite comprehensive scheme. However, in practice, there are several lower-level steps that should be executed in a professional manner to gain the results required.

For the next step, we are introducing the required stages.

### Basic stages of the QFD designation process:

1. Definition of product or service;
2. Definition of customers and target group;
3. What are the customers' expectations?;
4. Weighting of customer expectations;
5. Market analysis;
6. Requirements regarding formal design/product characteristics;
7. Determination of essential interactions;
8. Measurable characteristics of the finished product (technical target values);
9. Calculation of "Technical Significance";

10. The direction of improvement and further development;
11. Correlation of plan features;
12. Technical competitor comparison;
13. Technical and organizational difficulties;
14. Presentation to the client and determination of the further procedure.

Devoting proper attention to the data research process, valuable information should be provided for QFD designation from market and technological factors. Knowledge of experts could be utilized from the engineering and marketing sides (and we can pay attention to the chapters also elaborated and published in the current teaching materials regarding to Digital Tools supporting Customer Centric Innovation!).

If the data is reliable, timely and coherent than we can execute the basic steps by creating the house of the specific innovation loop.

For a better understanding, let’s go through the basic steps of the designation in the order required based on the works of Eshan S. Jaiswal (Jaiswal, 2012) and Sriram Madhav (Madhav, 2022).

The main steps for designing the QFD are demonstrated on the next pages.

**Steps for designing the QFD:**

***1. Identifying the “voice of the customer”***

*What are the desires of the (supposed or existing) customers?*

*How can we describe the desires accurately in the language of the customer (by qualitative factors)?*

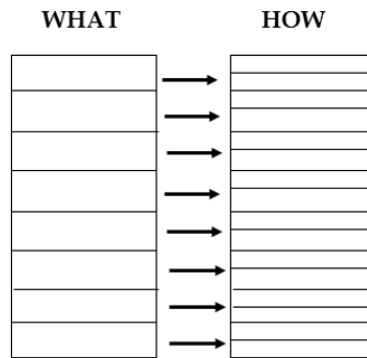
**WHAT**


***2. Translating the desires***

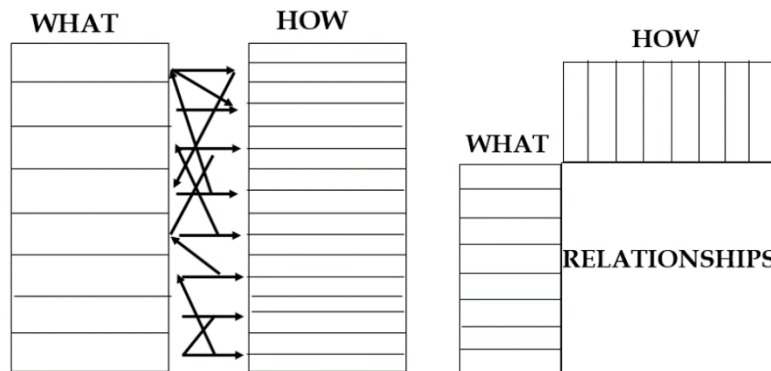
*2/a What kind of product features needed to satisfy the customer requirements?*

*(How the requirements will be satisfied with the product attributes?)*



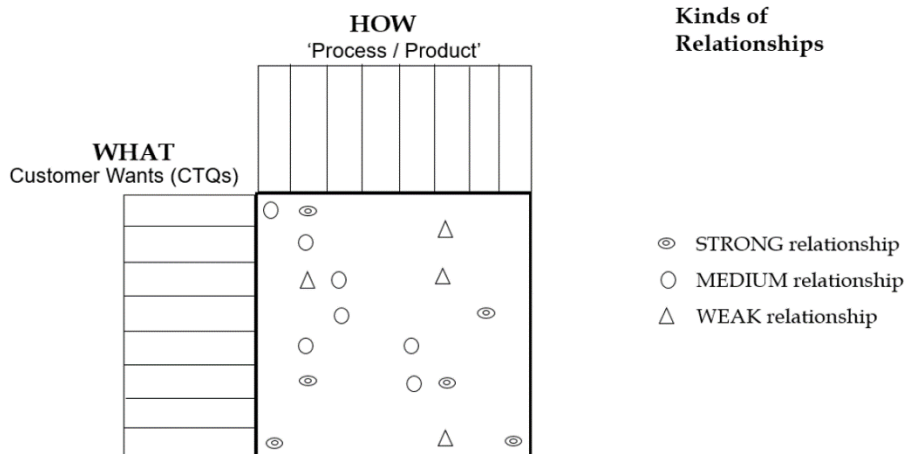


2/b What are the complex links between desires and attributes?



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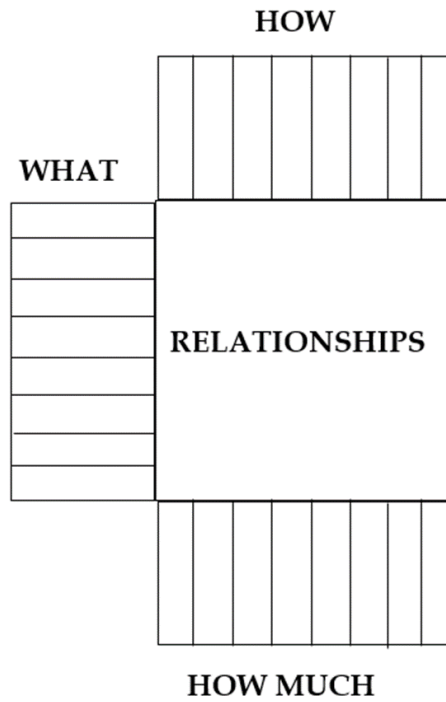
2/c Weighing the relationships



### 3. Introducing quantities

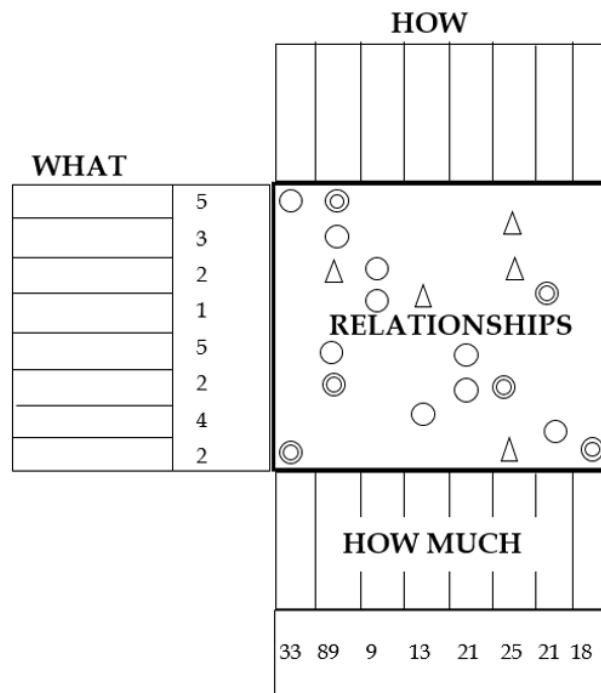
3/a Defining the quantities by asking:

What are the underlying quantitative factors for the required product design?  
(The desired product features require certain technological quantities and measures)



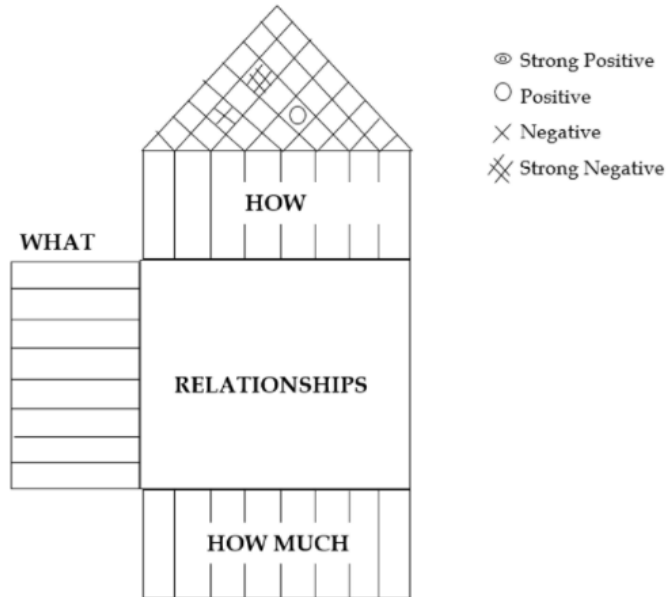
*Charts on the page edited by Sriram Madhav (Madhav, 2022)*

*3/b Weighing desires and quantities by asking:  
What are the more and less important desires and quantities?*



#### 4. Correlations between technical features

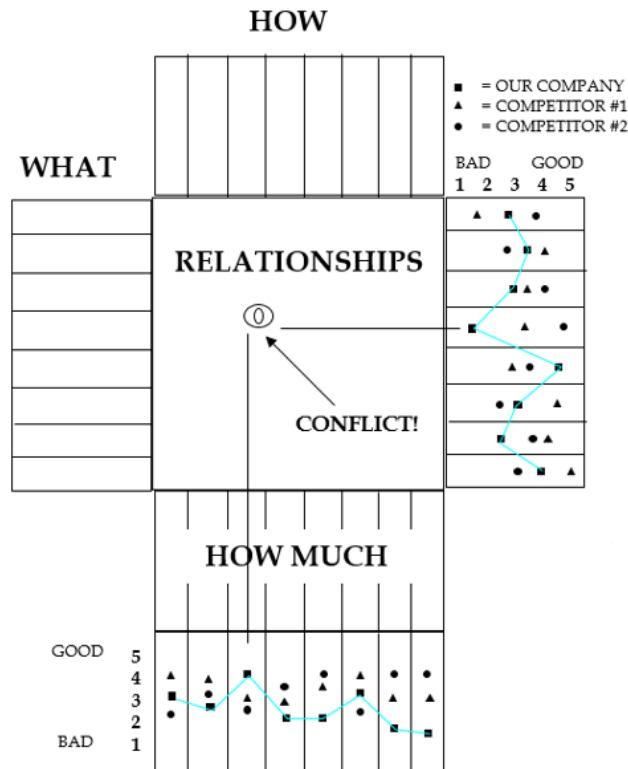
Where are the links between technical features?  
(Technical attributes are in correlation with each other by nature)



Charts on the page edited by Sriram Madhav (Madhav, 2022)

#### 5. Measuring competitiveness

How competitors performing in metrics derived from important customer needs?  
(Competitors' performance can vary from bad to good in given metrics)



*Chart edited by Sriram Madhav (Madhav, 2022)*

We went through the most important steps for designing a QFD matrix and gave elaborated steps how to build the famous houses in theory. Next, we are going to introduce a case study about a manufacturing company, which designed a matrix what is a very good example and also easily understandable for those who are relatively new to the method.

## **Example: refrigerator product planning**

The current example describes the QFD method in a specific sector, namely the refrigerator “industry”. Given the theory is applied correctly by the management team of the company, you can see on the designed QFD figure below the basic steps executed properly to build the ecosystem of houses.

The first house contains a list of the influence factors of the technical characteristics and the determination of their planned value based on the customer's needs. The technical characteristics are mostly measurable properties, with which one we can describe a given product. The product (refrigerator) specific factors are divided into groups according to major technical specifications, like operation, storage, dispenses, etc. The assessment of customer needs was done with the help of well-constructed questionnaires, using the interview technique. The information came directly from potential buyers and the dealer who has first-hand information about demands, complaints, and has insight into a larger customer base. Here they utilized the customer's own words, thereby also making sure that the designers do not paraphrase the needs too much using technical language. In order to preserve transparency, they grouped the needs and broke them down into different levels. Proper attention was paid to similar products on the market, in the opinion of customers, how well they satisfy the above expectations. The task of market research was also to provide an overview of the competitor's products and their market evaluation. The evaluation was done with a classification from 1 to 5 and expresses how well the individual products meet the individual customer requirements.

The second house starts based on the already gained information. Its task is to define the detailed characteristics of the subsystems and constituent elements. They properly defined the technical characteristics affecting the satisfaction of individual customer requirements in the language of designers and engineers (!). The three most important aspects were: compliance, task and appearance. In this case specifically temperature variation, temperature range or cooling speed and other key technological attributes embodied the underlying technical specifications. These kind of measurable (!) specifications should be set by a company to meet the characteristics of customer needs. The effect of the technical characteristics cannot be separated from each other.

To make it visible, links inbetween technical characteristics and links with customer needs defined by the company are depicted on the chart. Each customer requirement is influenced by one or more technical characteristics. Therefor customer needs and technical specifications are linked with a matrix-like layout, each row of which represents an expectation and each column represents a technical characteristic.

In the next step, the QFD activity already requires the involvement of the management. After filling in the relationship matrix, the team determined the unit of measure for each technical

characteristic, deciding if it was a measurable characteristic, and they prepared a comparison table, which includes the data of the competition and any similar product that they produced before. The table fits to the bottom of the relationship matrix so that each column has a technical characteristic and each row has a product on the market. It is easier to compare if this information is represented in a diagram.

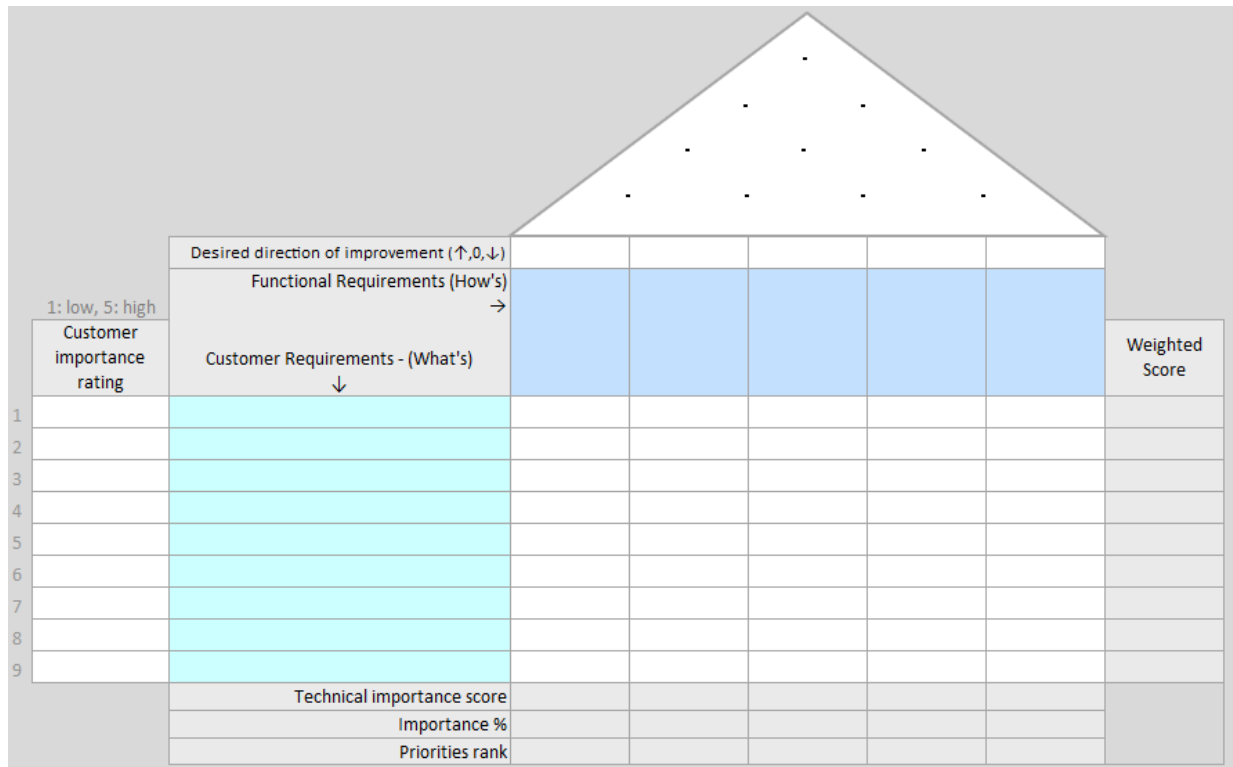
The third house is the development of the technological characteristics of the constituent elements based on the sub-tasks. Competitive evaluations and technical target values with difficulties were set by the team. The third house forms the basis of the quality control plan. As a final step, they determined the target value for the technical characteristics, based on weighted customer expectations, going through each one by one. Then they followed the designation of the characteristics that are closely related to the needs of the customers; goals that are easy to reach and that are important for sales. The application of the methodology was well-executed in this case. According to previous experiences, those features that were not marked as critical do not require a significant amount of attention later on.







*You can now draw the supposed QFD design for your company, using the matrix given in the example. We also embedded a simplified version below, allowing students to print out the form and practice. (Have a great time executing!)*



Customer importance rating 1: low, 5: high	Desired direction of improvement (↑,0,↓)					Weighted Score
	Functional Requirements (How's) →					
	Customer Requirements - (What's) ↓					
1						
2						
3						
4						
5						
6						
7						
8						
9						
	Technical importance score					
	Importance %					
	Priorities rank					

Figure 8 QFD matrix - practice sheet  
Source: KIT 2022

## Module 5: Modern teaching methods, Effective Teaching and Training Techniques

### Modern teaching methods

The continuous development of intellectual capital has become even more pronounced and necessary as a result of free competition in the market as a result of capitalism. It is only through the timely and appropriate development of intellectual capital that a company can maintain or improve its position in the market.

All this is independent of the size and quality of the companies. The easiest and most effective way of SME development is the eLearning procedure. This is a practical and available type of learning for every employee and its importance is much higher during this pandemic situation when

employees can't join the lessons in groups or most of the employees work from home. Nowadays online learning surfaces started to change their profile to serve the needs of SMEs.

The difference between the generations is a major challenge in education today, which is also reflected in the change in basic habits. While learning from books was taken for granted for barely a decade, the online world today largely offers quick access to information. Due to the technical and technological change on the one hand and the differences between the generations, on the other hand, education is constantly evolving. *According to Crockett (2016), "21st-century students need the following skills to be successful in life: problem-solving, creativity, analytical thinking, cooperation, communication, ethics, agency and accountability"*. The focus of development is on optimizing the curriculum, the teaching method, to ensure an effective learning process.

The paradigm shifts in education from traditional to modern teaching methods is a result of rapid technological change in the 21st century. Modern teaching methods have spread rapidly because of their efficiency. They are useful for students and easy to use for teachers. Technology plays an important role for both students and teachers. Students are involved in the learning process; they are at the centre of the teaching and thus they can design their learning path.

The perspective of teaching and learning is different, and students are not at the same level in terms of their characteristics, strengths, and abilities. The novelty lies in action-based teaching where the emphasis is more on collaboration, cooperation, and teamwork. The goal of modern technology is to make learning a joyful, easy process for students while meeting the demands of the marketplace. There is a lot of emphasis on practice. *According to Mehta (2021), "the characteristics of modern teaching methods are the following: 'learner-centred, task- or action-oriented, resource-based, interactive and integrative, collegial collaboration"*.

Students need to realize independent learning, information seeking and problem solving to excite them, which can be the basis for lifelong learning. Murugesan (2019) summarises the advantages of modern teaching methods as follows:

- They are participating in a media revolution that is profoundly affecting the way they think about and use information technologies.
- They are improving the way people learn in terms of learning fashions,
- improving their skills and abilities in applying their learning environment to real life situations,
- working in groups to learn cooperatively and collaboratively,
- to develop self-learning habits at their own pace and in their own time,
- they learn with the teacher and not from the teacher,
- to develop habits of inquiry-based learning,
- to use the right information in the right place at the right time to achieve the right goal,
- to investigate and explore qualitative data,
- share learning experiences and information with other students and teachers around the world.

In the following part we will briefly describe these methods.

**Problem-based learning** uses complex, real-world cases as subject matter and helps students develop problem-solving skills and learn concepts rather than just absorbing facts. Thus, it is not

about the traditional transmission of information and knowledge, but about solving an operational life situation using a practical example. Case study method can be a good example of it.

The **case study** provides a practical example of scenarios based on a real business situation. Teachers begin by having students read the case and summary together. Students then work in small groups to solve the case. Teachers set milestones that define what students should accomplish so they can better manage their time.

**Gamification** is the use of game elements and techniques (not in a game context) to engage people and solve problems (Deterding et al., 2011). Play is not just a self-serving, fun leisure activity, but a potentially value-adding tool that can transform all areas of life, make them effective and, not least, improve well-being and leisure mood (Fromann, 2017). This is exactly what is needed in 21st century education on a new foundation, namely easy learning when students can create interest, engage in collaboration, and learn through play.

**Presentation skills** are an essential part of modern teaching methodology, making it easier for students to navigate the future workplace. The main purpose of presentations is to develop professionalism. By using advanced technology, students can improve their skills.

**Project-based learning** is a teaching method in which students apply their knowledge and skills through an experience that provides them with opportunities to deepen contextual learning and develop important skills. It is more than just doing a project. This method connects students to the real world and prepares them to take on and overcome the challenges.

In the **flipped classroom**, the learning process is disconnected from the average. It is a learning method where students read and watch the content already at home and then absorb it at school. This has the advantage that students can acquire the information at their own pace.

**Cooperative learning** is an instructional strategy in which small teams of students are formed. They have different skills and abilities so that they can learn from each other. At the same time, their understanding and cooperative skills improve. It is easy to implement and not expensive.

**Design thinking** is a student-centred approach that can support creative thinking and problem solving in innovative ways. It is an iterative process and provides a solution-focused thinking that helps achieve empathy with the target audience.

**Thinking-based learning** teaches students how to think and make decisions. In class, students practice critical and creative thinking as they put theoretical knowledge into practice. The teacher's primary role is to show students how to find and analyze relevant information.

In **competency-based learning**, students' desired outcomes are the focus of the learning process. In this method, students are encouraged to learn in a specific way so that they can acquire the required competencies. It is a flexible way to provide a personalised learning path.

If we summarize the new methodology, we can state that the online environment, information technology, is an integral part of the development of new learning methods. When the three components of learning - cognitive, affective, and conative - and even metacognition are well balanced, these domains create a holistic learning experience that enables knowledge acquisition, self-directed learning, and lifelong learning skills. (Leary, 2012).

## Problem-based learning

Students need to realize independent learning, information seeking and problem-solving to excite them, which can be the basis for lifelong learning. We briefly describe below the main methods that can be utilized.

Problem-based learning uses complex, real-world cases as subject matter and helps students develop problem-solving skills and learn concepts rather than just absorbing facts. Thus, it is not about the traditional transmission of information and knowledge, but about solving an operational life situation using a practical example. The case study method can be a good example of it.

Problem-solving is presented differently in the various schools of psychology. Associated with Koehler's name is "insight-based learning," according to which we must allow students to solve the problem themselves. Problem-based learning has been brought to life in practice since it was applied at McMaster Medical College in Canada in the 1960s (Schwartz, P. et al., 2001). Theoretical knowledge is deepened when experienced by students in practice as it provides the opportunity to see causal relationships. Problem-based learning creates a special environment where the student becomes a small group or individual while acquiring new knowledge in a different way than traditional learning. After its initial successes, problem-based learning has expanded to other disciplines as it can be applied to any subject with a little creativity. Sherwood (2004) describes problem-based learning as a great opportunity for management education as this approach succeeds in bridging the gap between theory and practice. Problem-based learning is a comprehensive approach to teaching methodology based on the theory of cognitive learning (Moust et al., 2005). Cognitive psychology is concerned with the functioning of consciousness, the mental process, and its characteristics. Piaget talks about "internally motivated learning". In problem-based learning, I try to introduce case studies that arouse students' interest to the point that they want to solve the task. Bruner advocates "inquiry learning" in problem-based learning because students' existing knowledge, skills, and abilities are constantly improving as they process information. However, this requires that "students understand the structure of the curriculum." Students are much more open with each other than with their teachers. This allows all students to actively participate in group work.

*“Nilson (2010) lists the following learning outcomes related to problem-based learning. A well-designed problem-based learning project provides students with opportunities to develop skills related to: (1) working in teams, (2) managing projects and holding a leadership role, (3) oral and written communication, (4) self-awareness and evaluation of group processes, (5) working independently, (6) critical thinking and analysis, (7) explaining concepts, (8) self-directed learning, (9) applying course content to real-world examples, (10) research and information literacy, (11) problem solving across disciplines.” Weber (2007) summarizes the characteristics of problem-based learning, which are listed below. (1) “active learning and active student participation, (2) learning is a self-directed process, (3) students build their knowledge, (3) students are aware of what they have learned on their own to better understand or solve a particular problem, (4) students participate in structured processes in various roles, contributing to effective group learning and problem-solving, (5) this requires teamwork and communication skills.” Problem-based learning is a process that is used to identify problems with a scenario to increase the knowledge and understanding. Some of the principles are listed below. (1) “Independent and self-directed learning.*



*(2) Learning happens in a group and the teacher is a facilitator. (3) All groups must participate equally. (4) Students learn about motivation, teamwork, problem-solving and engagement with the task. (5) Materials such as Data, photographs, articles, can be used to solve the problem.” (Ali, 2019, p.73)*

Problem-based learning begins with a situational analysis of a real business problem, where students identify the problem based on their prior knowledge and gather suggestions to solve it. Learning is supported by instructors and a variety of primary and secondary sources of information. Students will then evaluate each option for feasibility. The instructor's role is to analyze the decision-making process, think critically and creatively, and help students identify roles and support them in solving the problem with their questions.

The application of problem-based learning is highly dependent on the preparation of the method as well as the level of detail in the curriculum design. The most important task of the teacher is to explain the purpose of problem-based learning and support the students' ideas and initiatives. Students get used to the new schedule from lesson to lesson and their brain starts to solve the tasks. More support from the teacher is needed in the initial phase, which is then gradually reduced so that the barriers for the students are broken down, the groups are free to make their decisions and they begin to enjoy the work process.

*Barrett et al. (2005), Barrett (2006, p.15) and Barrett (2017) suggest the following steps to begin the problem-based learning process.*

1. *“First, students are presented with the problem.*
2. *Students discuss the problem in a small group.*
  - *They clarify the details of the case.*
  - *They narrow down the problem.*
  - *They brainstorm ideas based on their existing knowledge.*
  - *They determine what they need to learn to solve the problem that they do not already know (curriculum).*
  - *They discuss the problem.*
  - *An action plan is created to solve the problem.*
3. *In addition to the lesson, students work out the content of the syllabus on their own. The source of information is libraries, databases, the Internet, and professionals.*
4. *We return to the problem-based learning presentation, share the information as a group, and work together to solve the problem.*
5. *Students present and discuss the solution to the problem.*
6. *Students review what they learned in solving the problem.*
7. *Evaluate each student's process and contribution to the task.”*

The roles in problem-based learning are fundamentally different from the usual roles. Students, rather than the instructor, are the focus, are involved in their learning, and take responsibility for their knowledge. This requires different behaviours and responsibilities on both sides.

In problem-based learning, an active learning environment should be created where students begin a kind of self-learning process. Once their interest is piqued, the data and research they gather as they grasp the problem will automatically broaden their horizons and shape their approach. Interdisciplinary thinking is often essential to solving a problem.

The success of problem-based learning relies heavily on the teacher acting as a mentor, facilitating the processes, and gently guiding the group's thinking process and work. Understandably and descriptively, they outline various problem-solving options with the students. The goal is for the



instructor to encourage student self-learning and self-development. The instructor is not involved in the discussion, but only an observer. Well-formulated questions should stimulate thought; advice should be given only as a last resort when it is already necessary. Rather, more detailed explanations should be given, not necessarily advice. If students understand the nature of problem-based learning, the teacher's activity can be reduced. *Colburn (2000) made the following suggestions for educators regarding problem-based learning: (1) “ask open-ended questions, (2) wait for students to answer the questions and give them time to process the questions, (3) repeat or rewrite the ideas but do not criticize, (4) do not tell students exactly how to do a particular activity. (5) Maintain discipline and deal with behaviour problems. Problem-based learning may not work effectively for all students and teachers”.* The teacher acts as a mentor in ongoing communication, support, and makes assessment.

In group work, each student is allowed to contribute to the common solution through his or her work. In discussions, students express their own opinions, shaping the attitudes and knowledge of others. Interaction promotes better communication and adaptability.

In problem-based learning the situation is reversed, it is not the teacher who passes on new knowledge to the students, but they become aware of what knowledge is still missing to solve the problem. The teacher helps the students to master the required curriculum. Of course, students have different abilities, so the level, source and material of teacher support are different. Therefore, in the course of learning, they jointly determine what goals should be achieved and how to get there. As a result, students accept collaboration throughout their studies that prepare them for their future careers. They equip themselves to deal with critical comments and learn to compromise, defend their own opinions or suppress them in a given situation. Students develop a set of values related to the quality of their task performance within their group so that they perceive the performance of both them and others. Within the group, students can try their hand at being a leader, information gatherers, researchers, problem-solvers, decision-makers, communicators and presenters, thus strengthening their existing and newly acquired skills.

*Savin-Baden (2000) describes the benefits of problem-based learning as follows: (1) “adaptation and participation in change, (2) ingenuity in new and future situations, (3) creative and critical thinking, (4) holistic problem orientation, (5) recognizing and acknowledging differences/ similarities between perspectives, (6) cooperation in groups, (7) the possibility of recognizing learning gaps and strengths, (8) strengthening self-directed learning, (9) developing effective communication skills, (10) management of different data sources”.*

*Of course, there are also difficulties in using problem-based learning, which is described by Akinoglu and Özkardes Tandoğa (2007), as follows: (1) “A challenge to change teaching style. (2) Students need more time to solve problematic situations. (3) Some groups may finish the work earlier or later. (4) Problem-based learning requires a good curriculum and research reports. (5) It is difficult to implement problem-based learning in all classes, especially for students who do not fully understand the value and scope of social content problems”.*

In the case of frontal teaching, when the teacher introduces the new curriculum, there is little interaction between students, during which they are not involved in the curriculum, so attention is easily diverted. However, according to K. Nagy (2011, p. 14), the reduction of the teacher's pedagogical role leads to an increase in interaction, collaborative activity and student work, i.e. the reduction of the teacher's instructions and interventions has a positive effect on the children's independent work. Problem-based learning is a good way to increase interaction between students in the classroom, which is an excellent tool to analyze the real situation of business life with the

help of case studies. It is worthwhile to complement the processing of case studies with cooperative learning situations and gamification elements.

In summary, problem-based learning is an active way for students to learn basic problem-solving skills and gain new knowledge through interaction with each other, a key skill needed in almost every work environment (Phungsuk et al., 2017). *"In high-tech societies, workplace interaction plays an increasingly important role. Teamwork has come to the fore"* (Kagan, 2009). During problem-based learning, students gain experience that will benefit them in the workplace after graduation.

## Case study method

The case study provides a practical example of scenarios based on a real business situation. Teachers begin by having students read the case and summary together. Students then work in small groups to solve the case. Teachers set milestones that define what students should accomplish so they can better manage their time.

The case study method is a form of problem-based learning. *"Cases are narratives, situations, selected data samples, or statements that represent unresolved and provocative issues, situations, or questions"* (Indiana University Teaching Handbook, 2005).

Bruner (1991) explains the case method:

- *"It is effective: it employs active learning, involves self-knowledge, and the teacher acts as a facilitator.*
- *It promotes critical thinking skills: it uses the teacher's questioning skills and employs discussion and debate.*
- *Practises an administrative point of view: it requires students to develop a framework for decision making.*
- *Models a learning environment: it allows for the exchange and flow of ideas from one person to another and builds trust, respect, and risk-taking.*
- *Models the process of inductive experiential learning: it is valuable for promoting lifelong learning. It also promotes more effective contextual learning and long-term retention.*
- *It mimics the real world: Decisions are sometimes based not on absolute values such as right or wrong, but relative values and uncertainty."*

The most important thing in designing a case study is that it is based on a real business situation and creates a desire for knowledge. It is important to build on the skills acquired in the acquisition of previous subjects. The aim is for students to actively seek out opportunities to formulate their proposals on a particular topic. Group work aims to strengthen collaboration, shared thinking, discussion and implementation between students.

Steps of case study method:

1. Choose an appropriate case that is the best fit for the topic.
2. Develop effective questions.
3. Set ground rules with students.
4. Get students prepared.
5. Share the solutions
6. Evaluate, comment

In eliminating the problem, students gain fundamental knowledge and experience that they can use in other areas. The lecturer needs to see not only his field but also the related fields. Therefore, the case study method requires an interdisciplinary mindset.

There is no perfect solution to the current problem. The point is to creatively include multiple alternatives. This allows students to experiment freely and explore more arguments. Students must enjoy the learning process.

The initial problem of lesson planning takes a lot of time at first, but with practice it becomes routine. The teacher should stay in the background but have a clear overview of the lesson content, understand the problem, stay attentive with directed questions, and assist.

Groups of students should draw up a correct timetable (Gantt chart) of the tasks they want to complete week by week to get the job done properly. It is also worthwhile to include the division of tasks within the group in the schedule. The instructor will help with collaboration.

It is useful for instructors to regularly share their experiences in using the case study and discuss difficult situations. By discussing best practices, the methodology can be constantly improved.

In the case study method, the evaluation is also different from usual. It is difficult to assess subjective factors such as problem-solving skills, synthesis skills, critical and creative thinking, independent action, and group collaboration. In traditional teaching, memorized knowledge is taken into account, while here the emphasis is on the process. In summary, the following assessment methods can be used for the case study method: oral reports, process diaries, self-assessment, student assessment, instructor assessment, instructor observations, notes on individuals, tracking online interactions. It is advisable to consider multiple dimensions and address them in parallel during the assessment. The more factors we consider, the completer and more detailed the picture we get of the group and the individual. Feedback is warranted after each subtask. It can be part of the lesson for each group of students to give their opinions on each other's assignments.

The instructor should accurately record the performance, strengths, and weaknesses of the various groups and each student and suggest ways to optimize the purpose of the learning activity. In this way, students must improve their work.

*“Depending on the goals of the course, the instructor may encourage students to be systematic in their analysis. For example:*

- *What is the problem?*
- *What is the goal of the analysis?*
- *What is the context of the problem?*
- *What important facts should be considered?*
- *What alternatives are available to decision-makers?*
- *What would you recommend - and why?” (BU, 2021)*

In group work, there will naturally be more active and more passive members among the students. The role of the instructor is to assist the less active members with questions and instructions. In time, students will recognise their role in the group, identify with it, and find it challenging. The instructor should get the students to test their talents in other roles through various instructions to overcome weaknesses. Healthy competition between groups will also help you progress.

Student group work is characterized by interdependence because, to achieve a common goal, a good grade, there is constant communication within the group, which makes learning a social activity. In my opinion, students are involved in the acquisition of knowledge so that they can even learn the curriculum in class.

*“Most “full-fledged” cases have these common elements:*

- *A decision-maker grappling with an issue or problem that needs to be resolved.*
- *A description of the context of the problem (a law, an industry, a family).*
- *Supporting data, which can range from data tables to links to URLs, cited statements or testimony, supporting documents, images, video, or audio” (BU, 2021).*

Using the case study, students are confronted with real business problems, so they must constantly adapt to changing conditions. This requires different skills and abilities than traditional learning. Of course, in any group, there will be people who are good to communicate and working with, and those who are more difficult. This will also be the case in their future jobs. The case study comes alive. Students automatically set in motion a self-learning process as they can identify and address their weaknesses in dealing with the situation.

Traditional teaching seems easier and more common, especially when there is a lot of subject matter to teach and preparation takes a lot of time. Both the instructor and the students have to step out of their comfort zone in some situations and clear the way for the inexperienced. But after a few times, this path also becomes familiar.

This method also requires the lecturer to have different skills than traditional teaching, namely communication, counselling and mentoring skills that are just needed in a particular situation. And when the new method is combined with gamification, mastery of computer programs is also crucial. The following competencies can be developed using the case study method.

- Social competence: working cooperatively in a group, solving problems together,
- Cognitive competence: developing shared thinking, developing a systems approach,
- Communicative competence: developing communication skills and competencies through group discussion and adaptation.
- Personal competence: recognizing individual strengths through teamwork.

*“A major advantage of teaching with case studies is that students are actively involved in figuring out the principles by abstracting from the examples. This develops their skills in (1) problem solving, (2) analytical tools, quantitative and/ or qualitative, depending on the case, (3) decision making in complex situations, (4) dealing with ambiguities” (BU, 2021).* Bonney (2015) has shown that the case study teaching method improves student performance and perceptions of learning gains.

## Gamification

Gamification is the use of game elements and techniques (not in a game context) to engage people and solve problems (Deterding et al., 2011). Play is not just a self-serving, fun leisure activity, but a potentially value-adding tool that can transform all areas of life, make them effective and, not least, improve well-being and leisure mood (Fromann, 2017). This is exactly what is needed in 21st-century education on a new foundation, namely easy learning when students can create interest, engage in collaboration, and learn through play.

The use of gamification in education is still a new, innovative element that enriches everyday teaching. The purpose of gamification is to motivate the learner and achieve self-directed learning. However, the online environment, information technology, is an essential component in the development of new learning methods.

Therefore, the use of gamification is a great opportunity in traditional education, where we often deal with unmotivated students, making it difficult for educators to engage them in learning

activities (Marcos et al., 2014). Gamification is the use of game elements and techniques (not in a game context) to engage people and solve problems (Deterding et al., 2011).

"Gaming is not just a self-serving, fun leisure activity, but a potentially value-adding tool that can transform all areas of life, make them effective, and, not least, improve well-being and leisure mood" (Fromann, 2017, p. 15). This is exactly what is needed in 21st-century education on a new basis, namely easy learning when students can create interest, collaborate and learn through play. In the field of education, Prievara (2015) found that gamification can improve collaboration between students and between teachers and students. *According to Rab (2013), "the right approach to gamification in education can be based on changing attitudes"*. Fitz-Walter et al (2012) have shown that this method is extremely effective in engaging students in extracurricular activities.

The growing gap between generations, due in part to the information technology revolution, presents a significant challenge, especially for educators and educational institutions (Fromann and Damsa, 2016, p. 77). Generations Y and Z use the Internet for several hours a day, an activity focused on communication and information gathering processes. ICT (information and communication technology) is a part of students' lives, which means a way for them to have fun and relax. The use of technology expands opportunities, accelerates learning in a problem-based learning environment, and can also be an effective constructivist pedagogical approach to encourage the use of various ICT tools in the classroom (Czékman et al., 2017, p. 71).

According to Rigóczki's (2016) interpretation, the game mechanisms or operating principles are as follows: The game is self-contained, voluntary, promises success, liberating feeling (flow), the game has a guaranteed time, transparent - the results are predictable, the rules are clear, the player sees how things stand - or the game takes place in a social space where players can communicate with each other, help each other. A distinction is made between the elements that serve the process of the game and those that are responsible for its reinforcement, i.e. motivation. Elements that characterize the process of the game: the story and characters, presentation (the game can be followed visually), the division into elements, stages accompanied by a scoring system, feedback, quests (independent episodes that are more or less independent of the basic story), performance indicators (points, leaderboards, etc.) and levels.

*Kapp et al. (2014) "distinguishes between two directions of game-based learning: content-based game, where the curriculum itself becomes a game (e.g., with a frame story), and structural game, where game elements and mechanisms are assigned to the curriculum"*

*Nicholson (2015, pp.4.) defined the components of the gamification system with the acronym RECIPE. The RECIPE for meaningful gamification is the following. "To operationalize these concepts, six elements inspired by game design will now be explored more in-depth:*

- *Play – facilitating the freedom to explore and fail within boundaries*
- *Exposition – creating stories for participants that are integrated with the real-world setting and allowing them to create their own*
- *Choice – developing systems that put the power in the hands of the participants Information – using game design and game display concepts to allow participants to learn more about the real-world context*
- *Engagement – encouraging participants to discover and learn from others interested in the real-world setting.*
- *Reflection – assisting participants in finding other interests and past experiences that can deepen engagement and learning."*



The structure of gamification consists of elements of computer and video games through which participants can be well motivated and thus kept in the game (Barabási, 2018 according to Czibor and Ferkov, 2012 and Éberfi, Engelhardt and Kutor, 2017):

- Points, scoring systems: they are available for completing a task and providing feedback to game participants. They add up throughout the game, so they are constantly growing. However, thanks to the immediate feedback, the player also has the opportunity to correct his mistakes.
- Levels: by reaching a certain number of points, the player advances in the game, his character develops, which also provides feedback on performance.
- Leaderboards: they are used for comparison so that the participant of the game can track his position compared to other players.
- Badges: on the one hand they can express rank, on the other hand, they symbolize continuous progress. In some cases, they can also trigger levels.
- Onboarding: the impression the player gets in the first few minutes is crucial for the rest, so it is important to make the start interesting and fun for them. To achieve this, it is not advisable to load a lot of information.
- Challenges and Quests: show the player what they have to do in the game, but also flash the bigger goal in front of them. Short-term and moderately difficult challenges tend to have the most motivational power.
- Virtual Goods / Wealth and Gifts: obtained by solving tasks. These can vary: they can stand out from the rest of the player, or they can be given away or given to teammates later.
- Customization: in the game, you can choose avatars, select the background, edit the user profile. All this is possible to make the player feel comfortable and loyal to the game.
- Feedback: is displayed in cycles so the player knows what position they are in.

Gamified teaching is often used to encourage active student participation and promote a creative way of thinking. Playful learning is more interesting, exciting and more importantly, it helps you avoid the feeling of failure in class. The psychological basis of learning through play is to create a connection between feelings of success. In conjunction with a successful learning experience, we trick our brains into becoming addicted to learning.

It is also important to include technology because phones and the internet are now part of our everyday lives, that is why we should not ban their use in education. Completely changing the system of rewards and punishments, collaborating with other students to achieve certain goals, eliminating competition between kids - these are all means of gamification that lead to deeper, more hands-on lessons that get students excited about learning.

Using different gamification elements and game programs, such as Kahoot, is also a good motivational tool. It is worthwhile to use gamification at the end of the training, where participants can repeat what they have learned with a game test. Members of Generations Y and Z like hands-on thinking and game-based learning. This is a good incentive for the training participants to pay attention to what is being said.

We use gamification in the form of an online quiz so that we ask for new knowledge at the end of the lesson. The feedback from the students is positive, they like to learn in a fun way. In education,



Prievara (2015) found that gamification can improve collaboration between students and teachers and students.

The application of gamification in education offers a new way to motivate students. The method can be used to identify individual learning paths where the student becomes part of their learning. Learning is an active process that happens much faster when the learner is involved and takes responsibility for their work.

The benefits of gamified learning are:

- Students feel that they are responsible for their learning.
- A more relaxed atmosphere in terms of failure, as learners, can simply try again
- More fun in the classroom
- Learning becomes visible through progress indicators
- Learners can discover an intrinsic motivation for learning
- Learners can explore different identities through different avatars or characters
- Learners often feel more comfortable in-game environments and are therefore more proactive and open to making mistakes
- Higher levels of student engagement and concentration
- The opportunity to think outside the box. Tasks are no longer just about completing a worksheet - what are the wider implications of a game.

## Project-based learning

The project method emerged in the United States in the early twentieth century as a critique of the traditional school. In traditional schooling, the application of knowledge is disconnected from knowledge itself; it is not clear what the knowledge learned in each subject can be used for. The conception of the project method was based on the principles of John Dewey (1859-1952), who emphasized the following connections, among others.

- Learning should be based on personal experience.
- Instruction should take into account the developmental needs and interests of the learner.
- The learner must be actively involved in shaping his or her learning process.
- The learner should be educated to participate actively in the affairs of the community and to become a citizen who feels responsible for the community.

*„Project-based learning (PBL) is a model that organizes learning around projects” (Thomas, 2000). “The core idea of Project Based Learning is that real-world problems capture students’ interest and provoke serious thinking as the students acquire and apply new knowledge in a problem-solving context. The teacher plays the role of facilitator, working with students to frame worthwhile questions, structuring meaningful tasks, coaching both knowledge development and social skills, and carefully assessing what students have learned from the experience” (David, 2008)*

*“In project-based learning, students work in groups to solve challenging problems that are authentic, curriculum-based, and often interdisciplinary. Learners decide how to approach a problem and what activities to pursue. They gather information from a variety of sources and synthesize, analyze, and derive knowledge from it. Their learning is inherently valuable because it's connected to something real and involves adult skills such as collaboration and reflection. In the end, students demonstrate their newly acquired knowledge and are judged by how much they've learned and how well they communicate it. Throughout this process, the teacher's role is to guide and advise, rather*

than to direct and manage, student work.” (Solomon, 2003) Steps for applying the project-based learning technique:

### Step 1: Preliminary planning

It may be developed by the teacher or with one or more colleagues who have experience with the PBL method. The plan should be well thought out but flexible enough to be changed at any time.

- **Choice of topic:** Choose a topic that the students like. So it is worth involving them in the choice of topic as well. Usually there is a compromise solution, where the main topic is given by the lecturer, but the concrete implementation, subtopics, etc. are worked out together with the students. To do this, it is necessary to clarify in advance exactly what the goal of the project is: how to stick to the original idea of the lecturer and how to give free rein to the ideas of the students. The process of collective topic selection can be well supported by the technique of brainstorming. Choosing an original, distinctive project topic - while the children discuss and discard other ideas - is in itself an inspiring, creative task.
- **Objective:** Define what we want to achieve with the PBL method in the classroom and what kind of knowledge we want to impart. For example, organize a party for the students to attend and define in advance what learning objectives we want to achieve - e.g. history, literature, communication, drama - and design the process so that they really have a chance to achieve these objectives. A project will only work if this goal is known to the participants and they take it seriously and really want to achieve it, even at a high level.

### Step 2: Planning and organizational tasks

- **Assess what is needed:** Do I need money to carry out the project? If so, how much and from what source? What resources will be needed? Where can I obtain them? How much space will be needed for the project? How should the space be designed? What information will be needed? (What else do you need to look for)? Who else is / should be involved in the project? (e.g. definition of stakeholders)
- **Organize working groups, assign tasks:** Pay attention to group dynamics, i.e. make sure there are people in the group you can expect to work together without much conflict. When setting tasks, keep in mind the goals of the project (e.g., what skills the project should develop). Try to give members of the group tasks that they are good at so that they have a sense of achievement, but also tasks that will challenge them and give them the opportunity to develop.
- **Create a task plan and a schedule:** For more complex tasks, it is worth tabulating firstly the deadlines and secondly when and who is responsible for what. The table should also include the aspects already mentioned, such as the necessary tools. It is advisable to involve the participants in the planning as well, as this is likely to make them feel more comfortable with the tasks and participate more responsibly in the joint work. With a well thought-out task and schedule, it is possible to avoid participants being "ready to work" and having no tasks, and to reduce the likelihood of chaotic situations due to lack of time.

### Step 3: Create a project protocol

In any learning process, it is extremely important that participants are intentionally involved. In the case of a project, this means that participants always keep in mind both the end goal of the project and the learning objectives as they work. This awareness process is served by the project diary, in which we continuously record the experience, i.e. ultimately what the participants have learned.

The project diary can be an individual diary, kept by each person, or it can be a collective diary of the whole project, in which the collective experiences are recorded. In the latter case, of course, someone must be assigned to keep a diary. For large projects, the most practical solution is for each smaller working group to keep its own collective diary.

Use the possibilities offered by your computer and the Internet for effective logging. The great advantage of a project diary kept on the Internet, possibly using a blog engine, is that the diary can be viewed and even commented on by everyone involved in the project, using the commenting features of blogs. (Publicity can of course be restricted, and it is advisable to set the preferences so that the project diary is only visible to project participants.) Another advantage of such reflective blogs is that the contributions of individual project participants or working groups can appear on a common interface, provided that the technical requirements are met. keep the same diary for more than one person. Last but not least, the teacher can keep an eye on the blog and comment on it.

### Step 4: Conclusion and evaluation

The conclusion includes the presentation of the project results and the evaluation of the whole work process. The participants should be actively involved in the evaluation of the project, as in the whole process. The evaluation should follow a system with four criteria.

1. The work should be evaluated in terms of the process: how effective the joint work was.
2. The work should be evaluated in terms of learning: What learning took place during the implementation of the project?
3. Finally, the work should be evaluated in terms of the development of social relations: whether the team was able to work together, whether there were conflicts and whether they were able to manage them.
4. Evaluate the work in terms of the objectives set: Did the project meet the goals set, and if any of the goals were not met, what could be the reason?

The more specific and personal the evaluation, the better. On the other hand, participation in the project cannot be assessed in a traditional way and that the role of self and peer assessment is strengthened. Regardless of which assessment is carried out, the criteria must be communicated to the participants in advance.

In addition to the final act of assessment, it is also necessary to continuously monitor and evaluate the partial results during the work process, especially for more complex, longer-term projects. The written recording and logging of the steps and partial results of the implementation is very helpful in the evaluation.

### Advantages of the method

*“Assuming that all students cannot learn in the same way, educators need to develop and implement alternative teaching methods (Muthukrisma et al., 1993). Thus, Project-Based Learning isn’t limited in terms of knowledge*

*and information, but rather with their teacher’s help, it provides students with the opportunity to transform themselves during the learning process (Aggelakos, 2003). Nowadays, learning to read is no longer enough. Knowing how to solve problems, working collaboratively and thinking innovatively are considered to be 21st-century essential skills. Therefore, Project-Based Learning is generally accepted as an effective method for teaching processes, such as problem-solving and decision making (Thomas, 2000). Besides, experts should help in developing a character’s emotional, social elements apart from cognitive (Katz, 2000). Other positive outcomes by using Project Based Learning are the reduction of students’ anxiety (Boaler, 2002), and the enhancement of students’ learning quality compared with conventional teaching methods (Thomas, 2000).” (Efstratia, 2014)*

### **Disadvantages of the method**

*“On the other hand, Project-Based Learning is marginalized by the educators themselves, since they lack both training and experience in implementing this approach. Furthermore, deficient finance and technology are challenges that teachers have to overcome, while evaluation can be also ineffective when students use technology. Venturing into an alternative method opposed to sterile memorization discourages teachers since they are supposed to manage additional activities and demands, such as helping collaborative student investigations (Arbontaki and Filippou, 2003 cited in Katsarou and Dedouli, 2008).” (Efstratia, 2014)*

### **The success of the method**

*“It is undoubtedly true that a Project-Based Learning method is successful when seven essential elements are fulfilled. First and foremost, teachers should engage students’ interest and “need to know” and at the same time stimulate them by making a capturing driving question (Larmer and Mergendoller, 2010). Moreover, students are in charge of deciding whether they will use resources, how they will cooperate and communicate to achieve the goal of their challenging project (Frey, 1991). Besides, critical thinking is enhanced, and students can easily conduct their inquiry as well as innovate by exploiting sometimes the advantages of technology (Larmer and Mergendoller, 2010). An example is when a whole class of iPad launch their research, while at the same time they are connected to the teacher’s presentation to discuss a project. This technological improvement allows students to interact and simultaneously submit questions and answers (Webster, 2012). Finally, feedback and revision are also important before a student’s presentation in front of a real audience (Frey, 1986).” (Efstratia, 2014)*

***After all, before deciding on a learning method, you must first get to know your staff, as their strengths and limitations are the most crucial factors to consider during the selection process! You must pick the right type, particularly if you want your employees to be productive! If you want your SME to grow, you must constantly improve!***

## **Module 6: Digital tools for teaching and learning**

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### **Digital tools for teaching and learning**

Lastly, we would like to present numerous different digital teaching methods, that can be found in practice. All of them can be very useful if applied to the right circumstances and the corresponding problems. These techniques and resources serve as supplementary tools for the methods we

discussed earlier. Some of them are generally known, some might mean novelty for the reader. Let’s take a look at the list of the most commonly used tools based on Hart (2021).

Tool	Discription
Word	<p>Microsoft Word is a popular and versatile word processing tool used for creating all kinds of documents.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://microsoft.com/word">microsoft.com/word</a></li> <li>▪ Cost: Commercial. Free Trial</li> <li>▪ Availability: Download. Online at Office365</li> </ul>
Google Classroom	<p>Google Classroom is a free blended learning platform for schools that aims to simplify creating, distributing, and grading assignments. The primary purpose of Google Classroom is to streamline the process of sharing files between teachers and students.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://classroom.google.com">classroom.google.com</a></li> <li>▪ Cost: Free.</li> <li>▪ Availability: Online</li> </ul>
Gmail	<p>Gmail is a free web-based email service from Google. Also part of G Suite.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://gmail.com">gmail.com</a></li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Microsoft Teams	<p>Microsoft Teams is the team workspace in Office 365.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://teams.microsoft.com">teams.microsoft.com</a></li> <li>▪ Cost: Office365 requires a subscription</li> <li>▪ Availability: Online</li> </ul>
Quizizz	<p>Find and create quizzes. It works on any device with any browser. Live.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://quizizz.com">quizizz.com</a></li> <li>▪ Cost: Free.</li> <li>▪ Availability: Online</li> </ul>
Canva	

Tool	Discription
	<p>Canva is a graphic design platform that allows users to create social media graphics, presentations, posters and other visual content.</p> <ul style="list-style-type: none"> <li>▪ Website: canva.com</li> <li>▪ Cost: Free and Premium plans</li> <li>▪ Availability: Online and iPad app</li> </ul>
Genially	<p>Genially is a single platform for all types of interactive content</p> <ul style="list-style-type: none"> <li>▪ Website: genially.ly</li> <li>▪ Cost: Free and premium versions</li> <li>▪ Availability: Online</li> </ul>
Adobe Spark	<p>Adobe Spark is an integrated suite of media creation applications It comprises three separate design apps: Spark Page, Spark Post, and Spark Video.</p> <ul style="list-style-type: none"> <li>▪ Website: spark.adobe.com</li> <li>▪ Cost: Free.</li> <li>▪ Availability: Online. Download app</li> </ul>
Moodle	<p>Moodle is an open-source learning platform for K12, higher education and workplace training.</p> <ul style="list-style-type: none"> <li>▪ Website: moodle.org</li> <li>▪ Cost: Free. Open-source</li> <li>▪ Availability: Download</li> </ul>
EdPuzzle	<p>Edpuzzle lets you take any video off the web, edit it, add notes and questions for students and create virtual classrooms where you can monitor student work.</p> <ul style="list-style-type: none"> <li>▪ Website: edpuzzle.com</li> <li>▪ Cost: Free.</li> <li>▪ Availability: Online</li> </ul>
Kahoot	<p>Kahoot is a game-based learning platform for business and education.</p> <ul style="list-style-type: none"> <li>▪ Website: getkahoot.com</li> <li>▪ Cost: Free and premium plans</li> </ul>



Tool	Discription
	<ul style="list-style-type: none"> <li>▪ Availability: Online</li> </ul>
Mentimeter	<p>Mentimeter is a tool that lets you engage and interact with your audience in real-time.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://www.mentimeter.com">mentimeter.com</a></li> <li>▪ Cost: Free and Premium versions</li> <li>▪ Availability: Online</li> </ul>
WhatsApp	<p>Not just a personal messaging app, it's broadcasting, and group functionalities make it a valuable communication tool</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://www.whatsapp.com">whatsapp.com</a></li> <li>▪ Cost: Free</li> <li>▪ Availability: Download app</li> </ul>
Telegram	<p>Telegram is a cloud-based mobile and desktop messaging app with a focus on security and speed.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://www.telegram.org">telegram.org</a></li> <li>▪ Cost: Free</li> <li>▪ Availability: Download</li> </ul>
Google Docs & Drive	<p>Google Docs is used to create documents, Google Sheets for spreadsheets, and Google Slides for slide sets – individually or collaboratively. Google Drive is the cloud storage service, where you can also up host other files.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://www.google.com/docs">google.com/docs</a></li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Wikipedia	<p>Wikipedia is a key resource for quickly finding out about a topic, and then for delving into primary resources for deeper information.</p> <ul style="list-style-type: none"> <li>▪ Website: <a href="https://www.wikipedia.org">wikipedia.org</a></li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Google Forms	<p>With Google Forms, you can create and analyze surveys online.</p>

Tool	Discription
	<ul style="list-style-type: none"> <li>▪ Website: google.com/forms/</li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Google Translate	<p>Google Translate is a free online service for instantly translating text and web pages.</p> <ul style="list-style-type: none"> <li>▪ Website: google.com/translate</li> <li>▪ Cost: Free.</li> <li>▪ Availability: Online</li> </ul>
Mural	<p>A digital workspace for visual collaboration</p> <ul style="list-style-type: none"> <li>▪ Website: www.mural.co</li> <li>▪ Cost: Paid plans</li> <li>▪ Availability: Online</li> </ul>
Padlet	<p>Padlet is an online noticeboard, which means it can be used for personal note-keeping as well as collaborative brainstorming.</p> <ul style="list-style-type: none"> <li>▪ Website: padlet.com</li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
PowerPoint	<p>PowerPoint is Microsoft’s versatile presentation tool</p> <ul style="list-style-type: none"> <li>▪ Website: microsoft.com/powerpoint</li> <li>▪ Cost: Commercial. Free trial</li> <li>▪ Availability: Download. Online at Office365</li> </ul>
Camtasia	<p>Techsmith’s Camtasia is a tool to record, edit and enhance on-screen activity in the form of screencasts.</p> <ul style="list-style-type: none"> <li>▪ Website: techsmith.com/camtasia.html</li> <li>▪ Cost: Commercial. Free trial</li> <li>▪ Availability: Download</li> </ul>
Google Search	<p>This powerful web search engine is often described as the only e-learning tool you’ll ever need!</p> <ul style="list-style-type: none"> <li>▪ Website: google.com</li> </ul>

Tool	Discription
	<ul style="list-style-type: none"> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Facebook	<p>Primarily used by individuals for personal networking, it is also used in education for study groups.</p> <ul style="list-style-type: none"> <li>▪ Website: facebook.com</li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Excel	<p>Excel is a versatile spreadsheeting tool from Microsoft for personal, corporate and education use</p> <ul style="list-style-type: none"> <li>▪ Website: microsoft.com/excel</li> <li>▪ Cost: Commercial. Free Trial</li> <li>▪ Availability: Download. Online at Office365</li> </ul>
YouTube	<p>This video platform is both a key learning resource as well as a place for anyone to share their video content.</p> <ul style="list-style-type: none"> <li>▪ Website: youtube.com</li> <li>▪ Cost: Free</li> <li>▪ Availability: Online</li> </ul>
Zoom	<p>Zoom unifies cloud video conferencing, simple online meetings, and cross-platform group chat into one easy-to-use platform.</p> <ul style="list-style-type: none"> <li>▪ Website: zoom.us</li> <li>▪ Cost: Free and Premium versions</li> <li>▪ Availability: Online</li> </ul>
Google Meet	<p>Previous known as Google Hangouts Meet, it is now known as Google Meet. It is a place to hold impromptu video meetings as well as scheduled virtual training classes around the world</p> <ul style="list-style-type: none"> <li>▪ Websites: meet.google.com</li> <li>▪ Cost: Free.</li> <li>▪ Availability: Online</li> </ul>

Tool	Discription
Google Chrome	<p>Flipgrid is a video discussion platform in education around the world. Owned by Microsoft</p> <ul style="list-style-type: none"> <li>▪ Website: flipgrid.com</li> <li>▪ Cost: Free and Premium plans</li> <li>▪ Availability: Online</li> </ul>
Google Chrome	<p>Chrome is a web browser that can be used across multiple platforms. There are now many plugins and extensions available to extend its functionality.</p> <ul style="list-style-type: none"> <li>▪ Website: google.com/chrome</li> <li>▪ Cost: Free</li> <li>▪ Availability: Download</li> </ul>

## Module 7: Project task on topic Customer-centric innovation

### Project task on topic Customer Centric Innovation

#### Task 1: Group formation

Ask the participants to form groups of 3. Group formation can be spontaneous or guided, the idea is to form groups of 3 people who will work together for the rest of the project task.

#### Task 2: Choosing an industry

Assign 1 industry to each group. This will be the industry in which the consumer-centred product development process will be carried out by the groups. Suggested industries:

Information and communication technology

Households and kitchens

Foods and drinks

Sport and games

Transport

Clothes and accessories

#### Task 3: Collecting ideas, generating ideas

This task consists of three parts. The first is to present 5 to 5 innovations related to the previously defined industries to inspire. In the second part, the groups are asked to suggest ways to involve consumers in the process of idea generation and brainstorming. In the third part, each group will be asked to brainstorm 5-5 product ideas in their industry. For each idea they have to provide a name and a short description/explanation.

#### **Task 4: Filter the ideas, select the "winning" idea**

This task also consists of three parts. First, the teams are asked to make suggestions on how to involve customers in the idea selection process. The second step is for each team to present the 5-5 product/service ideas they have "generated", accompanied by a short (5 slide) presentation. The third part of this exercise is that the other groups, who are now "surrogates" for potential customers, vote on each product idea and whichever idea receives the most votes will continue with the more detailed development of that idea.

#### **Task 5: Develop the concept in detail**

In this task, the groups develop their chosen product idea in detail. They describe the main features and functions of the product/service. Part of the task is to identify these decision points where customer involvement is necessary/possible. The detailed concept is also presented by each group in a short (5 slides) presentation.

#### **Task 6: Outline marketing plan for the product/service**

Following the development of the product concept, the teams will draw up an outline marketing plan, covering the target group for the product/service, product policy choices, price strategy and tactics, channel policy choices and the planned steps in marketing communication. In the development of each point of the marketing plan, possible ways of involving consumers should be indicated. The outline marketing plan will also be presented to the groups, each with a short (5 slides) presentation.

#### **Task 7: Brand name, logo, slogan**

In a really creative exercise, the groups propose a brand name, logo and slogan for the product in question. Integrity and consistency are very important in this exercise, as the brand name, logo and slogan should all reinforce the personality traits of the brand, so it is a good idea to start the design with this, i.e. by defining the brand personality. The question is, how can these be designed to involve prospective customers and potential customers? The presentation of the finished creations concludes the seventh part of the exercise.

#### **Task 8: Test the product**

Before a product or service can be widely introduced to the market, it is very important to carry out appropriate tests. In this process, consumer involvement is essential. The teams are responsible for planning the testing of the product they are developing. How and by what methods would they test the product they have envisioned during a large-scale market launch? The sub-task concludes with the usual short presentations.

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Work Package 6, Activity 5

# Trial of the Train the Trainer programme

## III. Implementation report

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Prepared by:

University of Miskolc



**MISKOLCI**  
EGYETEM  
UNIVERSITY OF MISKOLC

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## Introduction

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First, we give a short explanation regarding the activity’s role within the overall project concept and the vocational training scheme in general. After this we describe the key elements of the training content, share basic organizing information about the activity and provide hints about the special elements the implementation encountered. We also demonstrate an overview of the professional content. Finally, by involving participants feedback we make our evaluation and suggestions related to this successfully implemented activity which took place in June 2022 in Hamburg, Germany.

## Program fit

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The project has 8 well-integrated complementary work packages.

Work package 6 contained **5** main activities:

Activity 1: Development of a concept and curriculum design, teaching materials etc. for a multiple-day train-the-trainer programme for teachers and consultants;

Activity 2: Inclusion of the contents and comparison with the SME-specific further training programme;

**Activity 3: Trial of the Train the Trainer program;**

Activity 4: Quality assurance as well as evaluation of the trial and preparation of an evaluation report;

Activity 5: Review and output finalization (based on the results of the evaluation).

According to the scheme, within the framework of the Train the Trainer programme, the concept and curricula of the SME-specific training programme had been developed and discussed in detail preliminary (intensively trained coaching is integrated into it). As the main teaching activity, the implementation activity discussed in this report was a key element for the overall goals of the project and was also executed successfully and with good feedback.

## Concept of the training content

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The training is categorized as a typical train-the-trainer program, where future trainers responsible for educating the management of SMEs are capacitated with the skills required for assisting SMEs in their respective areas. With the help of educated trainers SMEs will be utilizing their capacity for customer innovation to increase their productivity, competitiveness and readiness to employing



higher-skilled workers. Enhancing this, the tools and processes for digital customer innovation were discussed in a highly professional manner involving University experts.

## **Significance and classification in the national training system**

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Most importantly, the training fits into the overall adult-education training scheme in respected countries. However, it cannot be classified into a direct EQF level, given that it was designed for trainers from various backgrounds and levels of expertise.

The training material and the innovative teaching methods guaranteed value and new knowledge for students, given the fact that they mostly had not studied the corresponding University courses in their previous life. In case, from these high-level teaching curricula, the most relevant and practise-oriented were picked out, revised and redesigned for practical usability, also made suit for SME development purposes. The uniqueness of the knowledge transfer was based on a new approach when the University revised the conventional theoretical and practical methods (like QFD, HOQ) and translated them into the language and circumstances of small businesses. In other cases, where it was possible, models used originated from small business management methodologies, modifying them to meet the specific goals of the program. Also, the new teaching materials developed specifically for the training should have met the different needs of international students (trainers) in a tight training schedule. According to the official anonymous feedback, the program successfully met all the criteria mentioned above.

The implementation was carried out in Hamburg, on the dates of **1-3 June 2022**.

## **Admission and organisation of the training**

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The standard is for participants to take the knowledge to their respective organizations and serve as multipliers. To support this process, proper addressing and admission of participants (future trainers) were important, so carried out carefully. The invitation process was based on personal, pier-to-pier considerations, given the fact applicants should have had exact geographical location, organizational role, skills and expertise, small business connections and professional development needs or goals.

### **Admission process**

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Facilitating the acquirement of adequate participants, the project leader made sufficient efforts to involve colleagues with the required skills and connections to the entrepreneurial society.

The participants were selected based on:

1. Previous skills and experiences (professional and/or entrepreneurial)
2. Organizational role
3. Connections with small businesses and their owners
4. Geographical location

The average number of participants was eight (see attachment).

Participants were enrolled working in educative and non-profit organizations specialized in SME training or education.

## **Organization and personal tasks**

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The training was carried out basically by the experts of the University of Miskolc supplemented with guest lecturers specialized in the required professional fields. The main forum for knowledge transfer was classic classroom teaching and problem-solving. Participants were also tasked with homework to do and their ideas were encouraged and experiences embraced. Participants were distributed blank sheets for practising methodologies in groups and individually. The sharing of personal opinions and experiences was highly welcome when there was room to do so.

The training was carried out in Hamburg, the hometown of the Project Leader. It was an ideal location for partners to participate in person (based on geographical distances) and also for outside experts invited (mostly locals). Covid-19-related considerations were also taken into account for the decision.

## **Lecturers and study courses**

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Given the fact the University of Miskolc was responsible for the discussed work package, the teaching materials were also prepared by them in Miskolc preliminary. This also entails that lecturers from the University were taken charge of the teaching activity primarily, however, according to the final program schedule, outside experts with predefined special knowledge and experience were also invited. Those decisions were made mutually by the host institution (Project Leader) and the responsible organization (UM). The schedule, the identity of lecturers and the exact professional content of the training had been formed during several online meetings prior to the training activity took place, manifested in a commonly agreed detailed schedule.

## Participant profile and organisation of the training

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According to the evaluation data, the training was exceptionally well-organized by professional colleagues of the Lead Partner, with significant experience in program organising and management. Participants came from training and nonprofit organizations that focused on SME education or training. The background organizations were invited based on how they could qualify for becoming a good facilitator for further knowledge transfers towards SMEs. Participants had different educational backgrounds, but they all had valuable experiences regarding small business support. Participants were mainly part of the middle-aged generation, being in their thirties and forties. Female participants were overrepresented. The training was organized in different conference rooms of a particular, well-known hotel in Hamburg. The location was more than satisfying for teaching and idea-exchange activities. The program was based strictly on the teaching materials prepared by the University of Miskolc.

## Execution of the training

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The discussed training program was based on the concept that the training curriculum should be explained in a way for trainers that prepares them for their future role advising small and medium entrepreneurs. The training is a three-day well-established train-the-trainer program for SME advisors who need to further develop their respective knowledge and skills. Pedagogical methods are also included enabling future trainers to qualify and advise leaders and employees of SMEs about the acquisition, processing and implementation of customer innovations. Trainers were being introduced to how to transfer innovation-related knowledge. The methods acquired incorporated a toolbox of instruments and specific methods designed for SMEs. Participants were provided with sound advice on implementation also.

The program was structured in the following order:

1. Innovation in general
2. Customer-centric innovation
3. Customer-centric innovation in SMEs - Experiences of a survey and best practices
4. Quality Function Deployment (QFD) and House of Quality (HOQ)
5. Interactive case study solution
6. Modern teaching methods, Effective Teaching and Training Techniques
7. Digital tools for teaching and learning
8. Project task on customer-centric innovation

9. Discussions with participants in working groups
10. Evaluation and feedbacks

Classic style examination was not included in the program; however, participants were encouraged to solve examples and practise cases while sharing their opinions was encouraged with the help of directed and cooperative case study solving. Participants were awarded a unique certificate.

According to the feedback from lecturers, participants were quite docile. This can be attributed to the successful admission process and/or the properly planned and prepared training program and materials. Participants were first and foremost satisfied with the novelty and concept fit of the training. An optimal diversity of lecturers and the complementarity of topics also received positive feedback from participants. However, they also acknowledged that the real case application and practising of methods could have been extended, given the fact those novel theoretical methods require experience when applied to real business procedures (there is no room for experiments in business). On the other hand, those kinds of activities were not possible to incorporate into this particular program due to their time and resource-intensive attributes, however, other activities build on the idea under the project framework. The arguments mentioned also showed the eagerness of participants to apply their acquired knowledge, which is a very positive sign for the broader-scale impact of WP6 activities.

## **Main Findings and conclusions**

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The training is described as a conventional train-the-trainer program, where prospective trainers are equipped with the skills necessary to support SMEs in a versatile and flexible manner. SMEs will be using their potential for customer innovation with the professional support of knowledgeable trainers to boost productivity, competitiveness, and readiness to employ higher-skilled people.

The evaluation statistics show that the Lead Partner's professional colleagues, who have extensive experience in managing and organizing programs, structured the training quite professionally. At the same time, the study program was based strictly on the teaching materials prepared by the University of Miskolc. According to the feedback from lecturers, participants were quite docile. This can be attributed to the successful admission process and/or the properly planned and prepared training program and materials. Participants were first and foremost satisfied with the novelty and concept fit of the training. An optimal diversity of lecturers and the complementarity of topics also received positive feedback from participants. However, they also acknowledged that

the application and real case practising of methods could have been extended. (Those kinds of activities were not possible to incorporate into this particular program due to its time and resource-intensive attributes, but other activities build on the idea under the project framework.) The arguments mentioned also showed the eagerness of participants to apply their acquired knowledge, which is a very positive sign for the broader-scale impact of WP6 activities.

In summary, the training was deemed highly useful by participants and rationally feasible by lecturers. The trainers developed the skills necessary to impart special knowledge to business owners that they couldn't obtain elsewhere on their own. They were introduced to new tools and techniques they were able to practise on the spot. Furthermore, the trainers' professional ability to help the business owners with their post-training research and learning processes made them capable of supporting overall lifetime learning objectives. Positive comments were also made on the compatibility of themes and the diversity of instructors.

With the new materials and methods practised, the trainers became capable of transferring unique knowledge to entrepreneurs, they cannot access elsewhere in the needed form. Supplementing this, the teaching methods learned turned the trainers capable to assist the entrepreneurs professionally with their post-training research and learning processes keeping them up to date and supporting overall lifelong learning goals. The collaborative work of PP8 and the Lead Partner supported participants with their learning process in the specific field of customer-oriented innovations for small businesses. Presentations and overall documentations serve as a support element.

## Attachments

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### 1. List of teaching materials and presentations

1. Concept of the Train the Trainer Program
2. Program and Content
3. Methods and digital Tools
4. Digitalization Skills for SMEs
5. Introduction to Further Training Programs
6. Coaching during the training program - KAIN method
7. Quality Function Deployment
8. Modern Teaching Methods

## 2. Certificate template



# Certificate of Attendance

It is hereby certified that

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has participated in the Train-the-Trainer program “Customer-Centric Innovations” developed in the Erasmus+ project “Digital methods, toolbox and trainings for increasing customer innovation in SMEs” (IClinSMEs). The three-day training took place on June 01-03, 2022, in Hamburg, Germany.

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Dr. Max Hogeforster

Chairman of the Hanse-Parlament



Co-funded by the Erasmus+ Programme of the European Union



## **Work Package 6: Train-the-Trainer Program B “Customer-Centric Innovations”**

### **Activity 4: Quality assurance as well as evaluation of the trial and preparation of an evaluation report**

#### **IV. Evaluation Concept**

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**Prepared by: Dr Monika Zajkowska**

**Hanseatic Institute for Support of SMEs**



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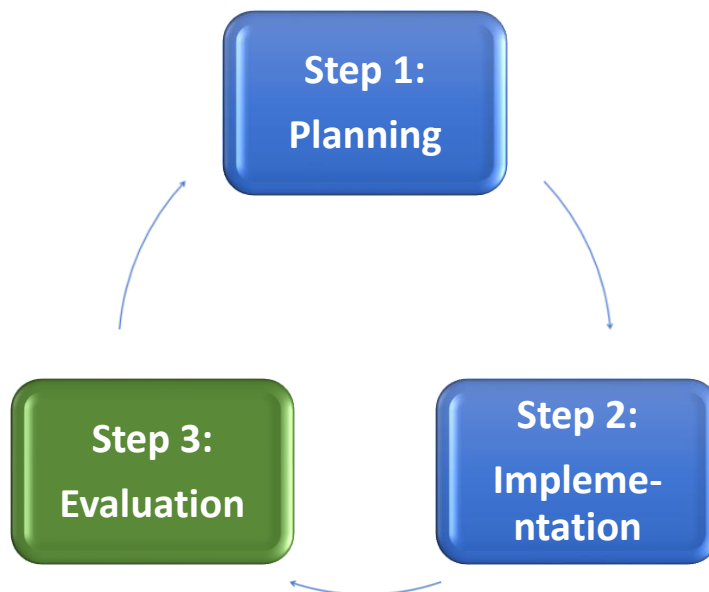
## 1. Definition of training evaluation

Training is the foundation of a modern organization. Properly selected and carried out, individual team members and the entire organization increase the effectiveness of operations step by step. Nevertheless, a lot depends on the quality of the training itself, so:

- skilful selection of the subject matter to the needs of employees,
- effective teaching methods used to conduct them,
- a well-thought-out training plan tailored to the employee's career path,
- reasonable organization of training in terms of logistics and technology.

And how to assess whether the implemented training solutions are effective? This is what their evaluation is for. It consists in verifying whether the training policy in the company is effective - and therefore whether it allows to achieve the company's development goals.

The evaluation is the final step of the training management cycle (diagram 1). A training management cycle can be divided into three major steps: Step 1: Planning; Step 2: Implementation; and Step 3: Evaluation. The results of the training evaluation are reflected in the next phase of training planning to improve future training programs.



**Diagram 1. Training Management Cycle**

Evaluation of training is one of the main components of a training programme. It will not only provide the trainer with useful information in order to further improve the training course, but also creates an impression of completeness.

An evaluation is the systematic and objective assessment of an ongoing or completed project, program or policy, its design, implementation and results. The aim is to determine the relevance and fulfillment of objectives, development efficiency, effectiveness, impact and sustainability.<sup>1</sup> The program evaluation is the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future programming.<sup>2</sup>

Evaluation of courses including gained results and found problems is essential to be able to develop further the existing training programs as well as to consider the experiences gathered from these programs when building new curricula. The evaluation process has been designed hand in hand with the courses themselves. This concept presents an overview of evaluation process and questionnaire.

## 2. Types of evaluation

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There are many different types of evaluations depending on the object being evaluated and the purpose of the evaluation. Perhaps the most important basic distinction in evaluation types is that between *formative* and *summative* evaluation. Formative evaluations strengthen or improve the object being evaluated -- they help form it by examining the delivery of the program or technology, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, inputs, and so on. Summative evaluations, in contrast, examine the effects or outcomes of some object -- they summarize it by describing what happens subsequent to delivery of the program or technology; assessing whether the object can be said to have caused the outcome; determining the overall impact of the causal factor beyond only the immediate target outcomes; and, estimating the relative costs associated with the object.

***Formative evaluation*** includes several evaluation types:

- *needs assessment* determines who needs the program, how great the need is, and what might work to meet the need
- *evaluability assessment* determines whether an evaluation is feasible and how stakeholders can help shape its usefulness

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<sup>1</sup> *Glossary of Key Terms in Evaluation and Results Based Management*

<sup>2</sup> Patton, M.Q. (1997). *Utilization-focused Evaluation: The New Century Text (3rd ed.)*. Thousand Oaks, CA: Sage.

- *structured conceptualization* helps stakeholders define the program or technology, the target population, and the possible outcomes
- *implementation evaluation* monitors the fidelity of the program or technology delivery
- *process evaluation* investigates the process of delivering the program or technology, including alternative delivery procedures

**Summative evaluation** can also be subdivided:

- *outcome evaluations investigate whether the program or technology caused demonstrable effects on specifically defined target outcomes*
- *impact evaluation is broader and assesses the overall or net effects -- intended or unintended -- of the program or technology as a whole*
- *cost-effectiveness and cost-benefit analysis address questions of efficiency by standardizing outcomes in terms of their dollar costs and values secondary analysis reexamines existing data to address new questions or use methods not previously employed*
- *meta-analysis integrates the outcome estimates from multiple studies to arrive at an overall or summary judgement on an evaluation question*

### 3. Steps of training evaluation

The processes of training evaluation can be divided into five steps: identify purposes of evaluation; select evaluation methods; design evaluation tools, collect data; and analyze and report results.

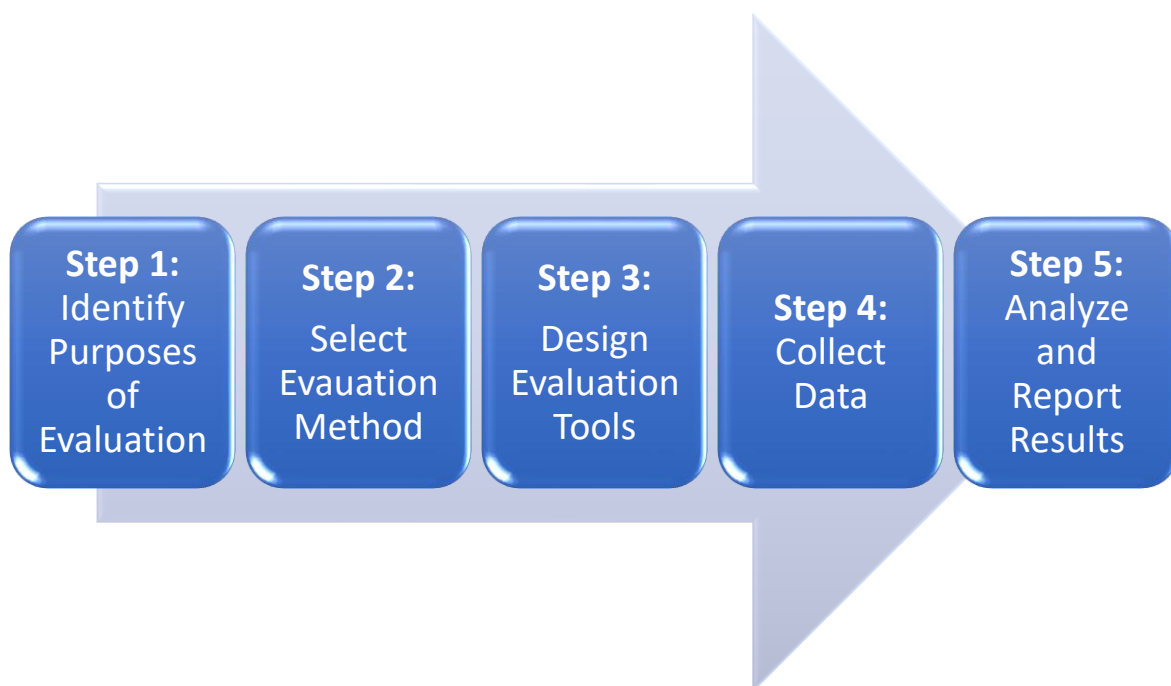


Diagram 2. Steps of training evaluation

**Step 1: Identify the Purposes of Evaluation**

- Before developing evaluation systems, the purposes of evaluation must be determined.
- Why do we want to evaluate training programs?

**Step 2: Select Evaluation Method**

- Kirkpatrick’s four levels of evaluating training programs
- Reaction, learning, behavior, and result

**Step 3: Design Evaluation Tools**

- Questionnaire
- Pre/Post Test
- Impact Survey

**Step 4: Collect Data**

- Who, when, how to collect data?

**Step 5: Analyze and Report Results**

- Evaluation data analysis
- Reporting

## Step 1: Identify Purposes of Evaluation

Before developing evaluation systems, the purposes of evaluation must be determined. These will affect the types of data and the data collection methods.

***Purposes identified by the GDLA Task Force***

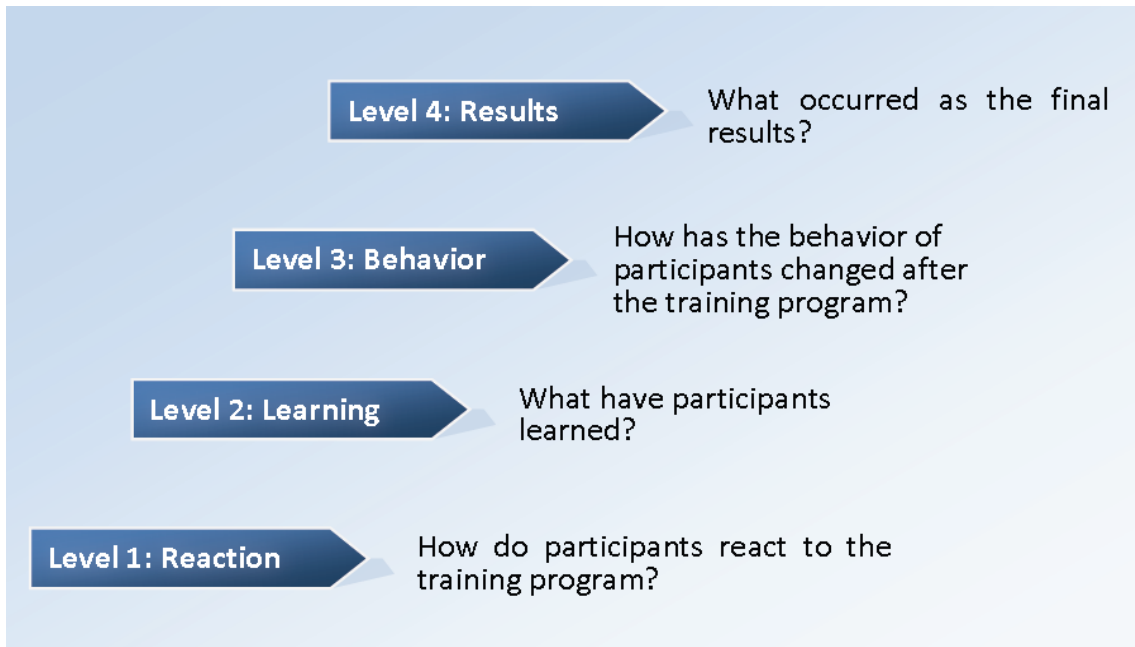
The GDLA Task Force has identified the following as the purposes of evaluating training programs planned and implemented by the Task Force for public officials in charge of local administration:

- To determine whether the objectives of the training were achieved.
- To see how the knowledge and skills learned in the training are put into practice.
- To assess the results and impacts of the training programs.
- To assess the effectiveness of the training programs.
- To assess whether the training programs were properly implemented.
- To identify the strengths and weaknesses of the training programs.
- To assess whether the training programs were suitable in terms of the training contents, timing, participants and other aspects.
- To find problems of the training programs and solutions for improvement.

## Step 2: Select Evaluation Method



One of the most commonly used methods for evaluating training programs is the four levels of evaluation by D. L. Kirkpatrick. According to his concept, capacity development is realized by the four sequential steps: Reaction; Learning; Behavior; and Results.



**Figure 1. Four levels of evaluation by D. L. Kirkpatrick**

### Level 1: Reaction

Evaluation on this level measures how participants react to the training program. It is important to get a positive reaction. Although a positive reaction may not ensure learning, if participants do not react favorably, they probably will not be motivated to learn.

### Level 2: Learning

Evaluation on this level measures the extent to which participants change attitudes, improve knowledge, and/or increase skills as a result of attending the training program. One or more of these changes must take place if a change in behavior is to happen.

### Level 3: Behavior

Evaluation on this level measures the extent to which change in participants’ behavior has occurred because of attending the training program. In order for change to take place, four conditions are necessary:

- The person must have a desire to change.
- The person must know what to do and how to do it.
- The person must work in the right climate.
- The person must be rewarded for changing.

#### Level 4: Results

Evaluation on this level measures the final results that occurred because the participants attended the training program. Examples of the final results include increased production, improved quality and decreased costs. It is important to recognize that these results are the reason for having some training programs.

When evaluating course, the goals and real results should be compared. This is not always possible or fair and just. The evaluation should be targeted only to such measurable issues on which the designer, teacher, facilitator or student himself has an impact. Evaluating the impacts of training programs against the presented main goals would require large societal researches including the recording of the initial situation before starting the programs and the long-term follow-up research in which the conducted interventions and actions (In this case new forms of training and education) and their impacts on change of variables is followed. The final conclusions can be drawn just after some years or after decades. In this project this is not possible and the whole evaluation process must be rethought and simplified.

The most important variables, on point of view of achieving the goals set, are the motivation of student, the support he gets, the relevance of issues in curricula, the quality material and training and the ability of facilities to support training and learning. Although most of the variables presented above are so called soft variables, which can’t be measured directly by targeting the measurement tool to some point or phase in the process, they can be assessed indirectly by assessing the feelings and comments of participants and other stakeholders.

### Step 3: Design Evaluation Tools

Various evaluation tools can be selected depending on the purposes and methods of evaluation.

- **Questionnaires**
- **Surveys**
- **Tests**
- **Interviews**
- **Focus group discussions**
- **Observations**
- **Performance records**

**For the Train-the-Trainer training evaluation the questionnaire will be used.**

The questionnaire is probably the most common form of evaluating training programs. Questionnaires to evaluate the reactions of training participants.

The first step of questionnaire design is to determine the information we would like to know.

The following are some information we wanted to ask participants.

Contents: Was the content appropriate?

Materials: Were the materials useful?

Teaching method: Was the teaching method appropriate?

Trainer/Facilitator: Was the trainer/facilitator effective?

Motivation to learn: Were you motivated to learn the contents?

Program relevance: Was the program relevant to your needs?

Level of understanding: Did you understand the contents?

Time: Was the time and length of program appropriate?

Length: Was the program length appropriate?

Facilities: Were the training facilities appropriate?

Overall evaluation: What is your overall rating of the program?

Planned improvements: How will you apply what you have learned?

The second step in questionnaire design is to select the types of questions. Questions that might be asked in a questionnaire can be classified into two major categories: open-ended and close-ended.

**In the questionnaire of Train the Trainer training both categories of questions will be used.**

The third step in questionnaire design was to develop the questions based on the types of questions planned and the types of information needed.

The fourth step in questionnaire design was to test the questions. They were tested on a group of people at approximately the same job level as the participants.

The following were some of the points to be checked when pre-testing the questionnaire.

Does he/she understand all the questions?

Does he/she have any difficulty in answering the questions?

Do all close-ended questions have an answer applicable to each respondent?

Are the skip patterns followed correctly?

Does any part of the questionnaire suggest bias on your part?

Does the questionnaire create a positive impression to motivate people to respond?

Based on the result of pretest in Step 4, the questionnaire forms were finalized.

#### Step 4: Collect Data

To improve the effectiveness of questionnaire data collection were recommended following:

- *Keep responses anonymous*
- *Distribute questionnaire forms in advance*
- *Explain the purpose of the questionnaire and how the information will be used*
- *Allow enough time for completing the questionnaire*

#### Step 5: Analyze and Report Results

An evaluation of the Train-the-Trainer is essential to identify problems and the quality of the training in order to be able to develop further the existing training programs as well as to consider

the experiences gathered from these programs when building new curricula. The evaluation process of each course has been designed hand in hand with the course itself.

Before summarizing and analyzing the questionnaire, the data need to be entered into a computer. Many statistical software programs are available for such data. There are many ways to analyze data, but the analysis should be as simple as possible and limited to what is necessary to draw the required conclusions from the data.

The next step is to consider what forms of communication will be most effective to present evaluation findings to the primary users. The following questions may be used as guidance to choose appropriate forms of communication.

- To what extent and in what specific ways is the information *relevant* to the user’s real and compelling problems?
- To what extent is the information *practical* from the user’s perspective?
- To what extent is the information *useful* and immediately applicable in the user’s situation?
- What information will the user consider *credible* and what reporting practices will support that credibility?

After knowing what kind of information will be relevant and useful to the primary users, the last step in evaluation process is to develop an evaluation report.

#### **4. The concept of Train-the-Trainer “CUSTOMER-CENTRIC INNOVATIONS” evaluation**

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##### 4.1. The aim of the Train-the-Trainer

The “Customer-Centric Innovations” Train-the-trainer (TTT) workshop was developed by PP8 MU Miskolci Egyetem (MU), Hungary and takes place in Hamburg, Germany on 1-3 Juni 2022 as part of the Erasmus+ project “ICIinSMEs”.

The output is a three- to four-day train the trainer programme for teachers and consultants of SMEs, who receive knowledge, skills, pedagogy, etc. in order to:

a) to qualify employees of SMEs with regard to the acquisition, processing and implementation of customer innovations, including all areas, possibilities and instruments and so on (independent of the use of digital technologies), see IO4.

b) to transfer a toolbox of instruments, methods etc. to SMEs and to provide sound advice on implementation.

The train the trainer programme is based on IO1 "Best Practice customer-centred innovation & digitisation" and draws in particular on the results of an A2 toolbox with so far already known as well as new instruments, methods and procedures for the acquisition, processing and realisation of customer innovations in SMEs (see IO1, A2).

Within the framework of the Train the Trainer programme, the concept, curricula etc. of the SME specific training programme "Realisation of Customer Centricity Innovation" are discussed in detail and intensively trained the coaching integrated into it (see IO4).

Activity A1 Based on the results of Output O1 "Best Practice customer-centric innovation & digitisation", development of a concept and curriculum design, Teaching materials etc. for a three- to four-day train the trainer programme for teachers and consultants, enabling them to qualify and advise SMEs on Acquisition, processing and realisation of customer innovations, including all areas, possibilities, instruments etc. (independent of the use of digital technologies).

The Train the Trainer program does not include a final examination, the participants receive a qualified certificate of participation.

The Train the Trainer program includes the following elements:

- a) Presentation, consulting and mediation aspects of the content of the SME specific training programme "Realisation of customer-centred innovations (see IO4)
- b) Presentation, advice and mediation aspects of the tools, methods etc. of the toolbox (see IO1, A2)
- c) Presentation, consulting and training of the coaching process
- d) Pedagogical issues

The training programme consists of a combination of presentations, consultations and discussions in plenary, work in small groups and role-plays.

Leadership PP8 MU with cooperation of PP5 HI and participation of all other partners

The training programme consists of a combination of presentations, consultations and discussions in plenary, work in small groups and role-plays.



The conclusions of the evaluation research will contribute to improve the quality, and especially the effectiveness of training, show the limitations of the training model and indicate the direction for further activities.

#### 4.2. Evaluation concept

The objective of the evaluation is to determine whether the goals of the program will be achieved in the implementations evaluated, and how the program has impact on student’s career and opportunities.

The evaluation process will be as follows:

1. The participants of the Train-the-Trainer will receive an online Semi-structured questionnaire at the end of the training (Appendix A).
2. Time for the survey (approx. 10 minutes) will be allocated in the end of the course.
3. The facilitator of the training informs the participants about the evaluation and its importance for further development actions. The purpose of the questionnaire and how the data will be used should be explained clearly to the participants. This will help to improve the response rate and encourage the participants to make comments that can be useful to improve future programs.
4. The questionnaires are being filled in online and submitted automatically and anonymously to the evaluator of the training.
5. The evaluator analyses all feedback surveys and summarizes them in a written analysis. Based on that, recommendations for the adjustment and future use of the curriculum result.

The evaluation approach will be based on a combination of qualitative and quantitative methods. The Microsoft Excel package will be used to transcribe the feedbacks and interviews. Open questions will be categorized, and qualitative analysis of the groups will be done.

The final evaluation report will discuss the following issues:

- Did the curriculum reach the targets?
- How well was the knowledge creation and sharing realized?
- Did the participants assimilate knowledge and tools?
- Was the venue and equipment appropriate for the training course?
- What kind of further development will be needed, if any?

#### **Schedule of the evaluations**

The schedule of the evaluation should be matched to the phases of the curriculum. There is no sense to evaluate the course before the students have a true and fair view of the course, its phases and contents. A closer schedule of each evaluation will be agreed later.

## Appendix A: Questionnaire for Participants of the Train-the-Trainer “Customer-Centric Innovations” Course

ICIinSMEs Train-the-Trainer “Customer-Centric Innovations” feedback survey
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Dear Train-the-Trainer participant,

Thank you for taking time to fill out this feedback form on the “Customer-Centric Innovations” Train-the-trainer (TTT) workshop, that was developed by PP8 MU Miskolci Egyetem (MU), Hungary in Hamburg, Germany on 1-3 Juni 2022 as part of the Erasmus+ project “IClinSMEs”, This survey is anonymous and will take approx. 5-10 minutes.

Please circle the scale that applies to your opinion on the following aspects of the education you participated.

General Assessment					
The overall training organization was good.	1	2	3	4	5
The facilitation (location, room etc.) was suitable for training.	1	2	3	4	5
The duration and the schedule for the training were appropriate.	1	2	3	4	5
The training met my expectations.	1	2	3	4	5
The overall atmosphere of the training was encouraging.	1	2	3	4	5
The training as useful or my work	1	2	3	4	5
I would recommend the training.	1	2	3	4	5

Comments:						
<b>Lessons and Topics</b>						
Topic 1	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 2	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 3	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 4	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 5	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 6	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5

Topic 7	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 8	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 9	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
<b>Free speech</b>						
What was good?						
What could have been done better? (E.g. was some topic missing or unnecessary)						
Would you recommend the course to someone you know? If not, why not?						
Was anything missing that you might need in your future profession / occupation / job?						
Was the proportion of topics and issues inside each topic suitable or should something be increased / decreased?						
Other comments						

**Thank you for your answers!**

## **Work Package 6: Train-the-Trainer Program B “Customer-Centric Innovations”**

### **Activity 4: Quality assurance as well as evaluation of the trial and preparation of an evaluation report**

#### **V. Evaluation Report**

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**Prepared by: Dr Monika Zajkowska**

**Hanseatic Institute for Support of SMEs**



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## Introduction to the Train-the-Trainer “customer-centric innovations”

Project goal - IClinSMEs

The project pursues on a broad regional basis the objective of enabling and supporting SMEs to exploit their customer innovation potential and thus to strengthen the productivity and competitiveness of SMEs, to secure existing jobs and to create new ones. A focus is put on the digital customer innovation tools and methodologies and hence, the digital skills qualifications of SME workers and managers. The following main activities will be carried out to achieve the objectives.

Purpose in hamburg – Train-the-Trainer

This Training program is developed within the framework of the EU Program *Erasmus + Key Action 2: Cooperation for innovation and the exchange of Good Practices* funded project **"Digital methods, toolbox and training for increasing customer innovation in SMEs"**. (IClinSMEs, Project NO 2020-1-DE02-KA202-007397).

The project aims to strengthen the innovation capacity of SMEs in Eastern Europe. In the frame of the project, two training programs for SMEs are developed, one focusing on the application of digital skills and technologies and the other on customer-centric innovation. Through the development of two specific training and coaching programs, SMEs gain digital skills and are enabled to continuously realise comprehensive customer-centric innovations.

These programs are organised by chambers and their training and technology centres, which have direct access to SMEs. To teach for and consultants qualify and advise SMEs at a high-quality level in the application of digital technologies and the acquisition, processing and realisation of customer innovations, two trains the trainer programs for teachers and consultants are developed to help trainers master the curriculum using modern teaching methods. The goal of these programs is a comprehensive qualification for teachers and consultants for SMEs.

Concept And Curriculum of The Train-The-Trainer Program B “Customer-Centric-Innovations”

As a starting point for this curriculum, it is worth describing what we exactly mean by Customer-centric innovation.

“Customer-centric innovation describes a change from innovating for customers to innovating with customers. Therefore, the customer takes an active role in innovation processes and becomes the primary source of ideas to initiate innovation activities. By integrating the customer-centric innovation philosophy, companies open their research and development activities, meaning that the innovation process happens with input from inside and outside of the company. Customers are involved in all stages of the innovation process.” (Desouza et al. 2020; Steinhoff & Breuer, 2014; Zajkowska, 2017)

The curriculum of the Train the Trainer Program B focusing on Customer-Centric Innovation is based on the results and experiences of the project, supplemented with modern teaching methods and case solutions. The project results are as follows:

An empirical study was conducted among SMEs which, on the one hand, underpinned the legitimacy of the planned training courses and, on the other hand, incorporated the experience gained by them into the curriculum of the training courses. The first part of the empirical research consisted of a questionnaire survey in which the awareness and diffusion of customer-centric innovations in SMEs, as well as the use of digital solutions that support their implementation, were measured. In addition to the questionnaire survey best practices were collected and investigated, on how SMEs generate, process and realise customer-centric innovation approaches and which digital technologies they can use doing so. A toolbox with instruments, methods and procedures for the realisation of customer innovations in SMEs was also developed. The teaching material of the training programme for SMEs “Realisation of customer-centred innovations” is also built in the TTTP-B. Best practices from training institutions serve with a useful contribution to the concept and material design.

**The Train the Trainer program includes the following elements:**

- Presentation, consulting and mediation aspects of the content of the SME specific training programme "Realisation of customer-centred innovations
- Presentation, advice and mediation aspects of the tools, methods of the toolbox
- Presentation, consulting and training of the coaching process
- Pedagogical issues

**Teaching methods**

The training programme consists of a combination of presentations, consultations and discussions in plenary, work in small groups and role-plays, case studies, and examples.

**Teaching materials**

PPT presentations, case studies, examples, best practices, question guides, checklists

Objectives, Target Groups and Duration of The Training

Programme And Content of The Train-The-Trainer

The Train-the-Trainer training took place on Juni 1-3, 2022 in Hamburg, Germany and was organized by IBC Partner No. 8 Miskolci Egyetem (MU), Hungary.

The training Agenda was as follows:

Module I: Welcome and ice breaker activity

- Greetings
- Objectives and execution of the training - Introduction to Train-the-Trainer Program
- Self-presentation of the participants
- Determination of the participants' previous knowledge

Module II: Innovation in general

Module III: Customer-centric innovation

- What is customer-centric innovation?
- Benefits and barriers for companies
- How to involve customers in product innovation?
- Methods and digital tools supporting customer-centric innovation.
- Tools for customer-feedback collection

Module IV: Customer-centric innovation in SMEs - Experiences of a survey and best practices.

- Customer-centric Innovation in SMEs - Results of an Empirical Research
- Best Practices in the use of digital technologies supporting customer innovations by SMEs
- Best Practices in the Transfer of Digital Skills and Technologies used in Customer-centric Innovations to SMEs - Experiences of Best Practices from Training Institutions

Module V: Quality Function Deployment (QFD) and House of Quality (HOQ)

Module VI: Interactive case study solution

Module VII: Modern teaching methods, Effective Teaching and Training Techniques

Module VIII: Digital tools for teaching and learning

Module IX.: Project task on topic Customer-centric innovation

Module X: Presentation of participants or groups

Schedule

**Program for the Train-the-Trainer Program B on “Customer-Centric Innovations” 3 days training**

<b>1st Day –Innovation and Customer-centric innovation</b>	
09:00 – 09:30	Module 1 - Welcome and ice breaker activity, Introduction to Train-the-Trainer Program, self-presentation of the participants
09:30 – 10:30	Module 2 – Innovation in general
<b>10:30 – 11:00</b>	<b>Coffee break</b>
11:00 – 12:30	Module 3 – What is Customer-centric innovation? Benefits and barriers.
<b>12:30 – 13:30</b>	<b>Lunch</b>
13:30 – 15:00	Module 3 – How to involve customers in product innovation? Methods and digital tools supporting customer-centric innovation. Tools for customer-feedback collection
<b>15:00 – 15:30</b>	<b>Coffee break</b>

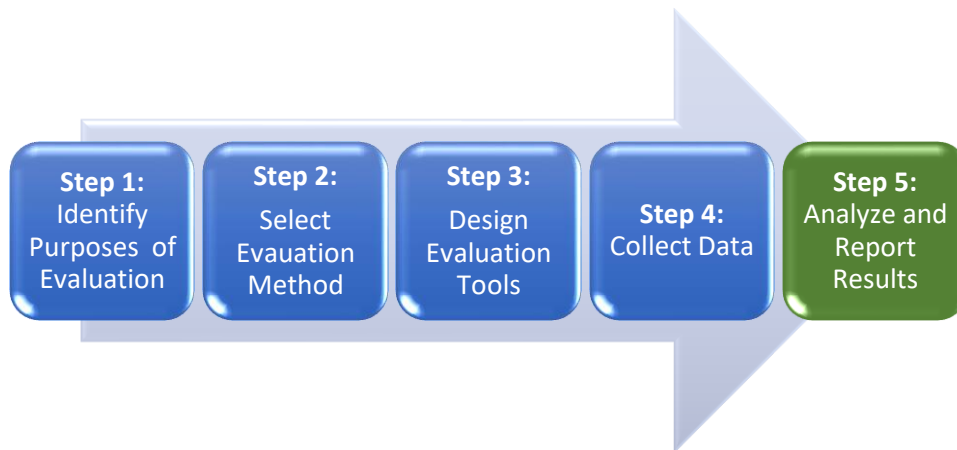
15:30 – 17:00	Module 4 – Customer-centric innovation in SMEs - Experiences of a survey and best practices.
	<b>Dinner and exchange of experience (optional)</b>

<b>2nd Day – Modern teaching methodology</b>	
09:00 – 09:30	Welcome day 2
09:30 – 10:30	Module 5 – Quality Function Deployment (QFD) and House of Quality (HOQ)
<b>10:30 – 11:00</b>	<b>Coffee break</b>
11:00 – 12:30	Module 6 – Interactive case study solution
<b>12:30 – 13:30</b>	<b>Lunch</b>
13:30 – 15:00	Module 7 – Modern Teaching Methods
<b>15:00 – 15:30</b>	<b>Coffee break</b>
15:30 – 17:00	Module 8 – Digital tools for teaching and learning
	<b>Dinner and exchange of experience (optional)</b>

<b>3rd Day – Project task</b>	
09:00 – 09:30	Welcome day 3
09:30 – 10:30	Module 9 – Introduction to the Project task on topic Customer-centric innovation
<b>10:30 – 11:00</b>	<b>Coffee break</b>
11:00 – 12:30	Module 9 – Independent work, or working in groups
<b>12:30 – 13:30</b>	<b>Lunch</b>
13:30 – 15:00	Module 10 – Presentation of participants or groups
<b>15:00 – 15:30</b>	<b>Coffee break</b>
15:30 – 17:00	Summary and conclusion of the Train-the-Trainer

### Steps of training evaluation

The processes of training evaluation can be divided into five steps: identify purposes of evaluation; select evaluation methods; design evaluation tools, collect data; and analyze and report results. This report concentrates on the step 5: Analyze and report results.



**Diagram 2. Steps of training evaluation**

***Step 1: Identify the Purposes of Evaluation***

- Before developing evaluation systems, the purposes of evaluation must be determined.
- Why do we want to evaluate training programs?

***Step 2: Select Evaluation Method***

- Kirkpatrick’s four levels of evaluating training programs
- Reaction, learning, behavior, and result

***Step 3: Design Evaluation Tools***

- Questionnaire
- Pre/Post Test
- Impact Survey

***Step 4: Collect Data***

- Who, when, how to collect data?

***Step 5: Analyze and Report Results***

- Evaluation data analysis
- Reporting

**Step 1: Identify Purposes of Evaluation**

Before developing evaluation systems, the purposes of evaluation must be determined. These will affect the types of data and the data collection methods.

***Purposes identified by the GDLA Task Force***

The GDLA Task Force has identified the following as the purposes of evaluating training programs planned and implemented by the Task Force for public officials in charge of local administration:

- To determine whether the objectives of the training were achieved.

- To see how the knowledge and skills learned in the training are put into practice.
- To assess the results and impacts of the training programs.
- To assess the effectiveness of the training programs.
- To assess whether the training programs were properly implemented.
- To identify the strengths and weaknesses of the training programs.
- To assess whether the training programs were suitable in terms of the training contents, timing, participants and other aspects.
- To find problems of the training programs and solutions for improvement.

### Step 2: Select Evaluation Method

One of the most commonly used methods for evaluating training programs is the four levels of evaluation by D. L. Kirkpatrick. According to his concept, capacity development is realized by the four sequential steps: Reaction; Learning; Behavior; and Results.

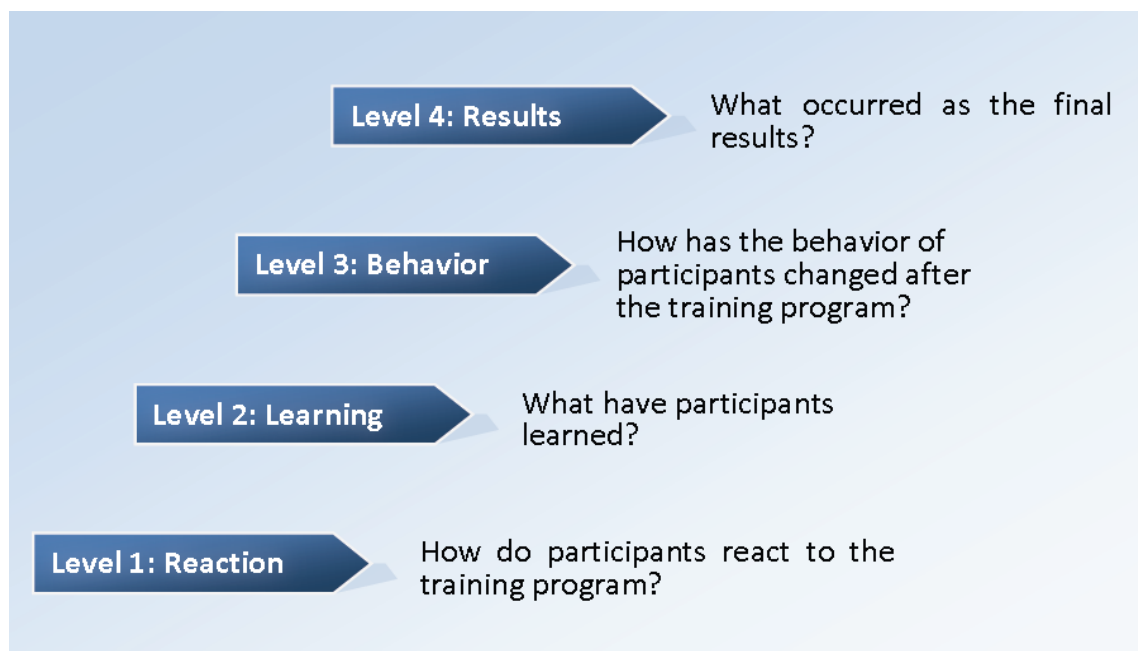


Figure 1. Four levels of evaluation by D. L. Kirkpatrick

### Level 1: Reaction

Evaluation on this level measures how participants react to the training program. It is important to get a positive reaction. Although a positive reaction may not ensure learning, if participants do not react favorably, they probably will not be motivated to learn.



## Level 2: Learning

Evaluation on this level measures the extent to which participants change attitudes, improve knowledge, and/or increase skills as a result of attending the training program. One or more of these changes must take place if a change in behavior is to happen.

## Level 3: Behavior

Evaluation on this level measures the extent to which change in participants’ behavior has occurred because of attending the training program. In order for change to take place, four conditions are necessary:

- The person must have a desire to change.
- The person must know what to do and how to do it.
- The person must work in the right climate.
- The person must be rewarded for changing.

## Level 4: Results

Evaluation on this level measures the final results that occurred because the participants attended the training program. Examples of the final results include increased production, improved quality and decreased costs. It is important to recognize that these results are the reason for having some training programs.

When evaluating course, the goals and real results should be compared. This is not always possible or fair and just. The evaluation should be targeted only to such measurable issues on which the designer, teacher, facilitator or student himself has an impact. Evaluating the impacts of training programs against the presented main goals would require large societal researches including the recording of the initial situation before starting the programs and the long-term follow-up research in which the conducted interventions and actions (In this case new forms of training and education) and their impacts on change of variables is followed. The final conclusions can be

drawn just after some years or after decades. In this project this is not possible and the whole evaluation process must be rethought and simplified.

The most important variables, on point of view of achieving the goals set, are the motivation of student, the support he gets, the relevance of issues in curricula, the quality material and training and the ability of facilities to support training and learning. Although most of the variables presented above are so called soft variables, which can't be measured directly by targeting the measurement tool to some point or phase in the process, they can be assessed indirectly by assessing the feelings and comments of participants and other stakeholders.

### Step 3: Design Evaluation Tools

Various evaluation tools can be selected depending on the purposes and methods of evaluation.

- **Questionnaires**
- **Surveys**
- **Tests**
- **Interviews**
- **Focus group discussions**
- **Observations**
- **Performance records**

**For the Train-the-Trainer training evaluation the questionnaire will be used.**

**The questionnaire** is probably the most common form of evaluating training programs. Questionnaires to evaluate the reactions of training participants.

The first step of questionnaire design is to determine the information we would like to know.

The following are some information we wanted to ask participants.

Contents: Was the content appropriate?

Materials: Were the materials useful?

Teaching method: Was the teaching method appropriate?

Trainer/Facilitator: Was the trainer/facilitator effective?

Motivation to learn: Were you motivated to learn the contents?

Program relevance: Was the program relevant to your needs?

Level of understanding: Did you understand the contents?

Time: Was the time and length of program appropriate?

Length: Was the program length appropriate?

Facilities: Were the training facilities appropriate?

Overall evaluation: What is your overall rating of the program?

Planned improvements: How will you apply what you have learned?

The second step in questionnaire design is to select the types of questions. Questions that might be asked in a questionnaire can be classified into two major categories: open-ended and close-ended.

**In the questionnaire of Train the Trainer training both categories of questions will be used.**

The third step in questionnaire design was to develop the questions based on the types of questions planned and the types of information needed.

The fourth step in questionnaire design was to test the questions. They were tested on a group of people at approximately the same job level as the participants.

The following were some of the points to be checked when pre-testing the questionnaire.

Does he/she understand all the questions?

Does he/she have any difficulty in answering the questions?

Do all close-ended questions have an answer applicable to each respondent?

Are the skip patterns followed correctly?

Does any part of the questionnaire suggest bias on your part?

Does the questionnaire create a positive impression to motivate people to respond?

Based on the result of pretest in Step 4, the questionnaire forms were finalized.

Step 4: Collect Data

To improve the effectiveness of questionnaire data collection were recommended following:

- *Keep responses anonymous*
- *Distribute questionnaire forms in advance*
- *Explain the purpose of the questionnaire and how the information will be used*
- *Allow enough time for completing the questionnaire*

## Step 5: Analyze and Report Results

An evaluation of the Train-the-Trainer is essential to identify problems and the quality of the training in order to be able to develop further the existing training programs as well as to consider the experiences gathered from these programs when building new curricula. The evaluation process of each course has been designed hand in hand with the course itself.

Before summarizing and analyzing the questionnaire, the data need to be entered into a computer. Many statistical software programs are available for such data. There are many ways to analyze data, but the analysis should be as simple as possible and limited to what is necessary to draw the required conclusions from the data.

The next step is to consider what forms of communication will be most effective to present evaluation findings to the primary users. The following questions may be used as guidance to choose appropriate forms of communication.

- To what extent and in what specific ways is the information *relevant* to the user’s real and compelling problems?
- To what extent is the information *practical* from the user’s perspective?
- To what extent is the information *useful* and immediately applicable in the user’s situation?
- What information will the user consider *credible* and what reporting practices will support that credibility?

After knowing what kind of information will be relevant and useful to the primary users, the last step in evaluation process is to develop an evaluation report.

## **Methodology of evaluation**

---

The aim of the evaluation

The evaluation has the following goals:

- 1.It has to provide objectified knowledge about the progress (quantity and quality) of processes.
- 2.It serves the control of such processes and helps capturing the strong and the weakpoints. Therefore, it is an instrument of quality assurance.
- 3.It serves the legitimization. In other words, a successful evaluation is evidence of competence of the person responsible for the process being evaluated.
- 4.Transparency, in order to make a dialogue possible.

In order to achieve these goals, the evaluation was performed in a process-related and summative manner: process-related (also formative, development-related) in order to evaluate the quality of the project progress and if necessary, to make changes. The summative evaluation or evaluation of

results serves the evaluation of the specified objectives within the framework of the project, final evaluation of impact and efficiency of the project lecturers management, of cooperation and transfer.

The **general aim of the study** is to evaluate the effectiveness of training „Train-the-Trainer Customer-centric Innovations“ realized within the Project “Digital methods, toolbox and trainings for increasing customer innovation in SMEs” (IClinSMEs) carried out in Hamburg, Germany. The conclusions of the evaluation research will contribute to improve the quality and especially the effectiveness of training, show the limitations of the training model and indicate the direction for further activities.

The results of a three-day train the trainer programme for teachers and consultants of SMEs who want to acquire knowledge, skills, pedagogy etc. to:

- a) to train employees of SMEs to successfully use digital technologies in the acquisition, processing and implementation of customer innovations (Output O2).
- b) to transfer digital technologies to SMEs and provide sound advice on implementation.

The Train the Trainer programme is based on Output O1 "Best Practice customer-centred innovation & digitisation" and includes in particular the results of A1 Best Practices of using digital technologies (IO1, A1) and A3 Digital technologies for the realisation of customer innovations (IO1, A3).

In addition, the Train the Trainer programme provides detailed information on the concept, curriculum, etc. of the SME specific training programme "Digital Competences" and intensively trains the integrated coaching (IO2 further education programme digital competences).

The Train the Trainer program includes the following elements:

- a) Presentation, consulting and mediation aspects of the content of the SME specific training programme "Digital Skills" (see IO2)
- b) presentation, advice and mediation aspects of the various digital technologies, namely
  - Best practices in the use of digital technologies (see IO1, A1)
  - Digital technologies for the realization of customer innovations (see IO1, A3)
- c) Presentation, consulting and training of the coaching process
- d) Pedagogical issues

The training programme consists of a combination of presentations, consultations and discussions in plenary, work in small groups and role-plays.

The conclusions of the evaluation research will contribute to improve the quality, and especially the effectiveness of training, show the limitations of the training model and indicate the direction for further activities.

#### Evaluation process

The evaluation process will be as follows:

6. The participants of the Train-the-Trainer will receive an online Semi-structured questionnaire at the end of the training (Appendix A).
7. Time for the survey (approx. 10 minutes) will be allocated in the end of the course.
8. The facilitator of the training informs the participants about the evaluation and its importance for further development actions. The purpose of the questionnaire and how the data will be used should be explained clearly to the participants. This will help to improve the response rate and encourage the participants to make comments that can be useful to improve future programs.
9. The questionnaires are being filled in online and submitted automatically and anonymously to the evaluator of the training.
10. The evaluator analyses all feedback surveys and summarizes them in a written analysis. Based on that, recommendations for the adjustment and future use of the curriculum result.

Research methods is written questionnaire as quantitative method.

Written surveys comprised closed-end and open-ended questions. The respondents had to answer to questions in five-point agreement scale including options: Absolutely disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Absolutely agree.

The evaluation approach will be based on a combination of qualitative and quantitative methods.

The Microsoft Excel package will be used to transcribe the feedbacks and interviews. Open questions will be categorized, and qualitative analysis of the groups will be done.

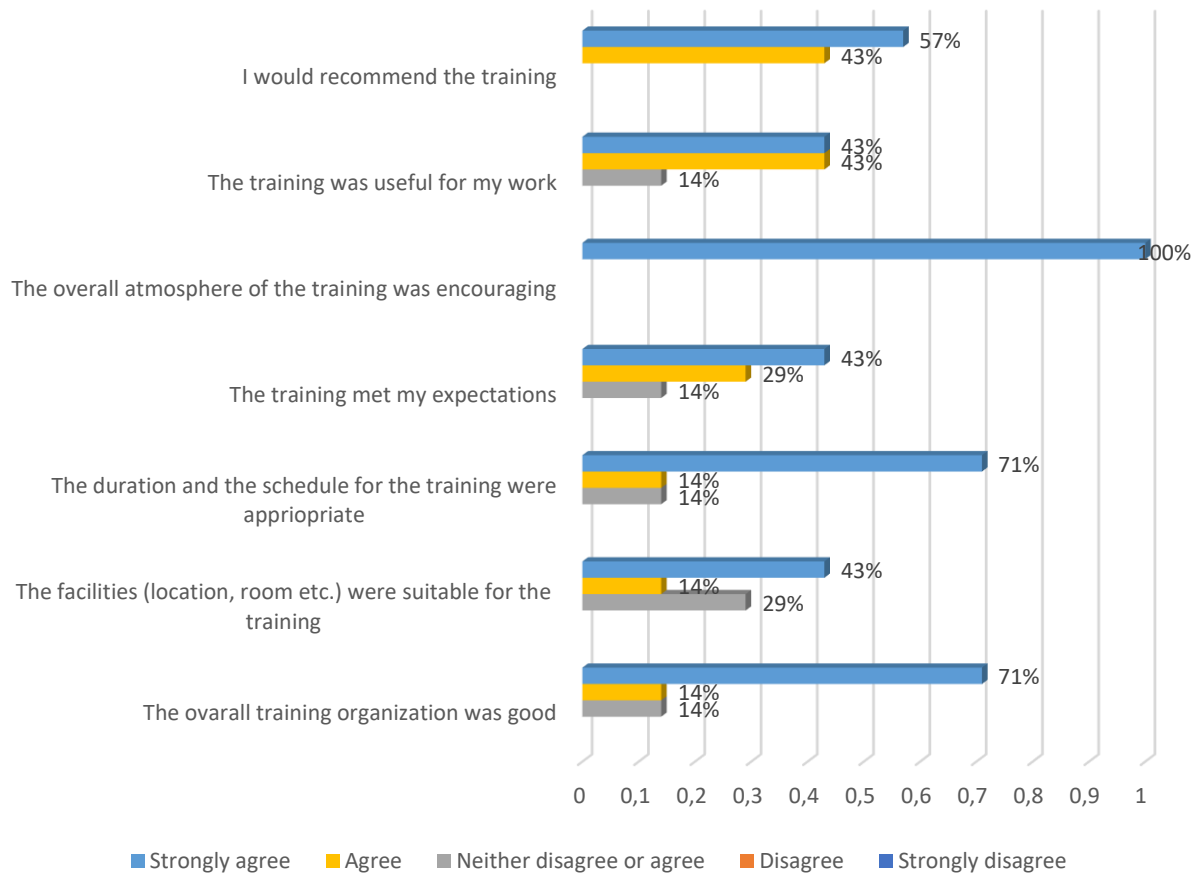
## Results and Recommendation

### General Assessment

Respondents were asked a number of questions to evaluate train-the-trainer in generally. The overall training organization was evaluated very high.

Figure 1. General Assessment





Source: own study

71% of participants assessed that the training absolutely met their expectations. One participant indicated the answer "agree", one participant had no opinion on this. Total results in this part of questionnaire indicate that TTT training met expectations of participants on average level 4.57. The answers to the question about the facilities of the training were varied. 43% of participants assessed the training as "strongly agree" and 14% "agree" that the facilities (location, room etc.) were suitable for the training. 29% of respondents did not have an opinion on this subject. of the participants, the duration and the schedule for the training were appropriate. 14% agreed with that statement and 14% of respondents did not have an opinion on this subject.

Respondents were asked a question to determine their expectations to the training. 43% of respondents strongly agreed with the statement that the training met their expectations (strongly agree). 29% stated that they agreed with the statement (agree), while 14% did not have an opinion on this subject. The overall atmosphere of the training was rated very highly and unanimously. 100% of participants indicated that the overall atmosphere of the training was encouraging.

Next, the participants of the training were asked if they would recommend this training. 57% of respondents indicated that they would strongly recommend training to the others. 43% of participants would recommend this training to others in smaller extent (agree). Last question in this part of questionnaire concerned usefulness of the training in the work. Responses in this

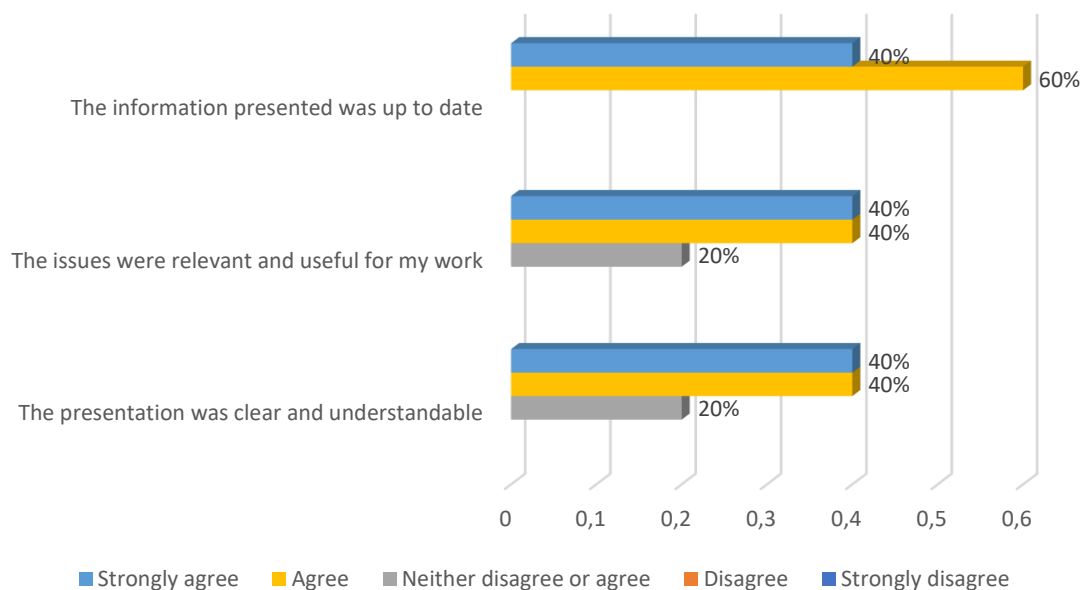
section were split: 43% of participants strongly agree with that statement and 43% only agree that the training was useful for their work. Results in this part of questionnaire indicate that TTT training was useful for participants in middle level 4.43.

Based on the results obtained, it can be concluded that the training did not fully meet the expectations of the participants (29% agree and 14% neither disagree nor agree), but the vast majority (43% strongly disagree and 43% agree) found the training useful in their professional work. This justifies the need to implement such training in the area of professional work performed by training participants.

Recommendations: better identification of the professional profiles of training participants in order to increase the usefulness of the training for their professional work and getting to know expectations better.

### Content and Topics

#### What is Customer-centric Innovation?

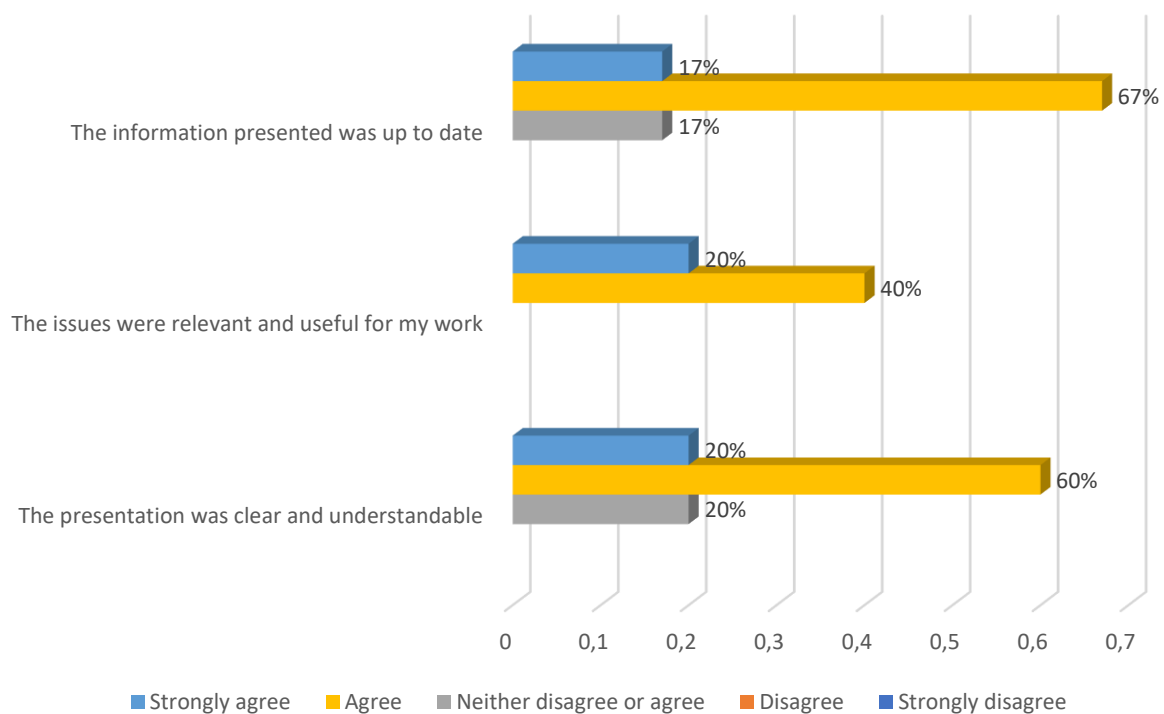


Source: own study

Another area of training evaluation was content and topics of the training. The training program was divided into individual thematic areas and was assessed during the evaluation. The first topic of the training was to define the concept of "Customer-centric Innovations". Participants assessed the presentation of the topic in three areas: clarity and understanding of the presentation, the suitability of the issues for their professional work and the topicality of the issues.

Most of the respondents (40% strongly agree and 40% agree) agree that the presentation was clear and understandable. 20% of participants do not have an opinion on this subject, which may mean that some content was not understandable and clear to the participants. The same group of respondents indicated answers in the next area of analysis. Most of the respondents (40% strongly agree and 40% agree) agree with the statement that the issue were relevant and useful for their work. 20% of participants do not have an opinion on this, which indicates that the content of the training may not be useful for some of the participants. All participants agreed that the information presented was up to date (40% strongly agree, 60% agree).

### How to involve customers in product innovation?



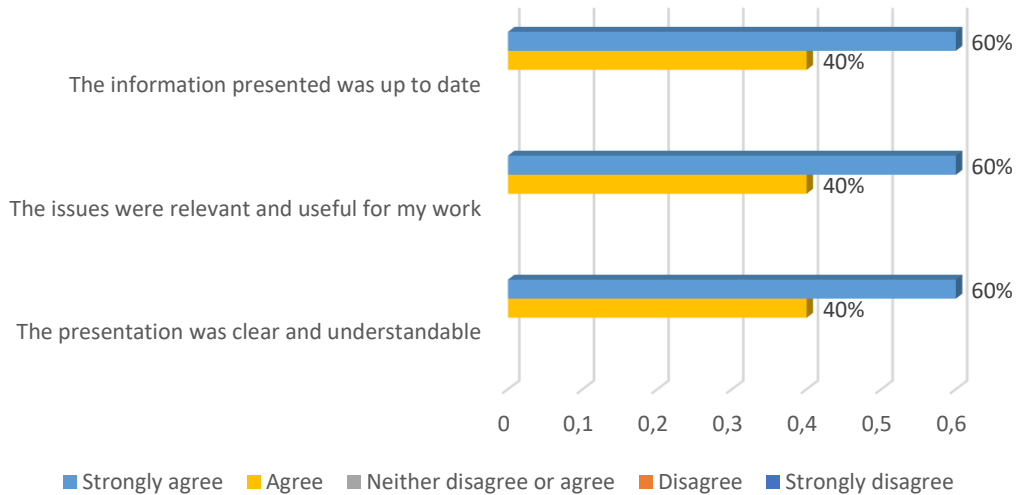
Source: own study

The next topic of the training was the topic “How to involve customers in product innovation?” Participants assessed the presentation of the topic in three areas: clarity and understanding of the presentation, the suitability of the issues for their professional work and the topicality of the issues.

Most of the respondents (20% strongly agree and 60% agree) agree that the presentation was clear and understandable. 20% of participants do not have an opinion on this subject, which may mean that some content was not understandable and clear to the participants. The participants were then asked if the issue were relevant and useful for their work. Most of the respondents (20% strongly agree and 40% agree) agree with the statement that the issue was relevant and useful for their work. 20% of participants do not have an opinion on this, which indicates that the content of the training

may not be useful for some of the participants. All participants agreed that the information presented was up to date (40% strongly agree, 60% agree).

### Introduction to Further training program B

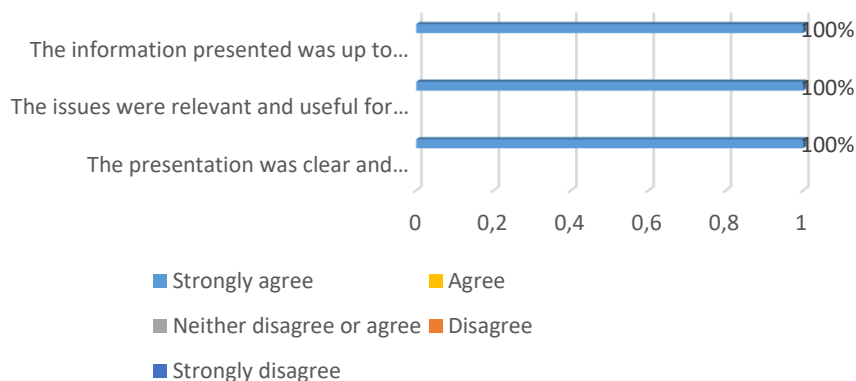


Source: own study

The next topic of the training was the topic “Introduction to Further training program B”. Participants assessed the presentation of the topic in three areas: clarity and understanding of the presentation, the suitability of the issues for their professional work and the topicality of the issues.

Most of the respondents (60% strongly agree and 40% agree) agree that the presentation was clear and understandable. The participants were then asked if the issue were relevant and useful for their work. Most of the respondents (60% strongly agree and 40% agree) agree with the statement that the issue were relevant and useful for their work. All participants agreed that the information presented was up to date (60% strongly agree, 40% agree).

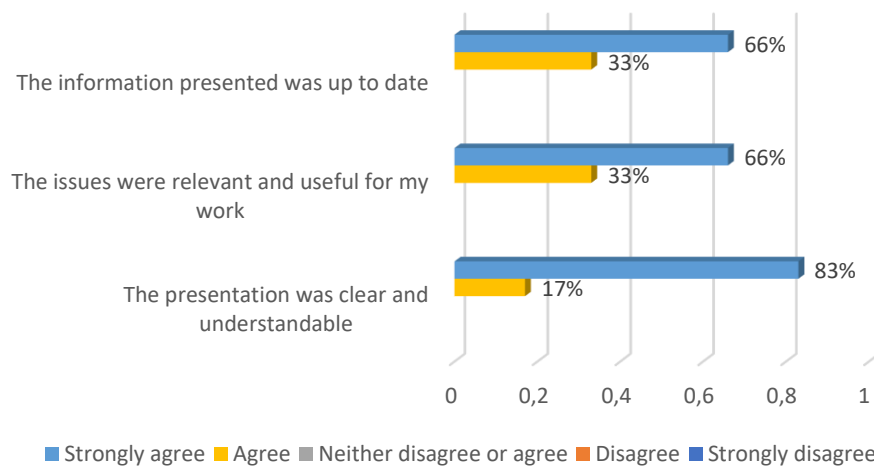
### Guest lecture "From Open Source Innovation to Lead User Innovation and Desing Thinking"



Source: own study

The next topic of the training was the Guest lecture “From Open-Source Innovation to Lead User Innovation and Design Thinking”. Participants assessed the presentation of the topic in three areas: clarity and understanding of the presentation, the suitability of the issues for their professional work and the topicality of the issues. The assessment of the training participants was of the highest level in all respects (100% strongly agree). A high rating on this topic indicates that participants are open to the participation of interesting guests or lecturers who enrich the training program as a whole.

### Coaching during the training program - KAIN method

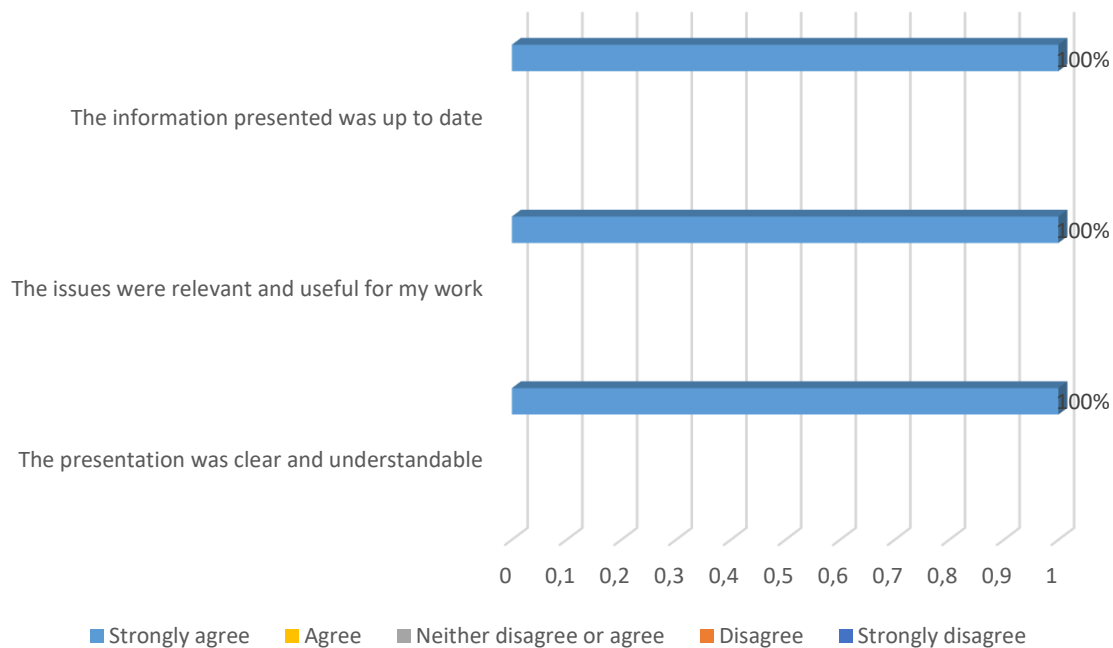


Source: own study

The next topic of the training was the topic “Coaching during the training program – KAIN method”. Participants assessed the presentation of the topic in three areas: clarity and understanding of the presentation, the suitability of the issues for their professional work and the topicality of the issues.

Most of the respondents (83% strongly agree and 17% agree) agree that the presentation was clear and understandable. The participants were then asked if the issue were relevant and useful for their work. Most of the respondents (66% strongly agree and 33% agree) agree with the statement that the issue were relevant and useful for their work. All participants agreed that the information presented was up to date (66% strongly agree, 33% agree).

### Workshop on applied Customer-centered Innovations



Source: own study

The next topic of the training was the Guest lecture “Workshop on applied Customer-centered Innovations”. Participants assessed the presentation of the topic in three areas: clarity and understanding of the presentation, the suitability of the issues for their professional work and the topicality of the issues. The assessment of the training participants was of the highest level in all respects (100% strongly agree). A high rating on this topic indicates that participants are open to the participation of interesting guests or lecturers who enrich the training program as a whole.

Recommendations: inviting outside guests to present part of the training, before the main topic of the training, an introduction should be added with basic definitions of concepts that will be discussed in the main part of the training, more detailed identification of the participants' needs and adapting the training content to their needs.

In response to the last open question, there was one remark: “More time for free speak with the other participants. I would have enjoyed that the dinner was planned on day 2”. This means, that in the future Train-the-Trainer should be considered in the organization of training more time for free speak with other participants.



## Appendix A: Questionnaire for Participants of the Train-the-Trainer “Customer-Centric Innovations” Course

ICIinSMEs Train-the-Trainer “Customer-Centric Innovations” feedback survey

Dear Train-the-Trainer participant,

Thank you for taking time to fill out this feedback form on the “Customer-Centric Innovations” Train-the-trainer (TTT) workshop, that was developed by PP8 MU Miskolci Egyetem (MU), Hungary in Hamburg, Germany on 1-3 Juni 2022 as part of the Erasmus+ project “ICIinSMEs”, This survey is anonymous and will take approx. 5-10 minutes.

Please circle the scale that applies to your opinion on the following aspects of the education you participated.

General Assessment					
The overall training organization was good.	1	2	3	4	5
The facilitation (location, room etc.) was suitable for training.	1	2	3	4	5
The duration and the schedule for the training were appropriate.	1	2	3	4	5
The training met my expectations.	1	2	3	4	5
The overall atmosphere of the training was encouraging.	1	2	3	4	5
The training as useful or my work	1	2	3	4	5
I would recommend the training.	1	2	3	4	5
Comments:					
<b>Lessons and Topics</b>					

Topic 1	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 2	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 3	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 4	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 5	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 6	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 7	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5

Topic 8	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
Topic 9	The presentation was clear and understandable	1	2	3	4	5
	The issues were relevant and topical	1	2	3	4	5
	The information presented were up-to-date	1	2	3	4	5
<b>Free speech</b>						
What was good?						
What could have been done better? (E.g. was some topic missing or unnecessary)						
Would you recommend the course to someone you know? If not, why not?						
Was anything missing that you might need in your future profession / occupation / job?						
Was the proportion of topics and issues inside each topic suitable or should something be increased / decreased?						
Other comments						

**Thank you for your answers!**