

# Further training program “Realisation of customer-centred Innovations”

## Modul 14 Digitalization

### Teaching Material 7 Digitalization

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## 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.

## Framework conditions

The level of analysis considered in this report is small and medium-sized enterprises (SMEs) in the 13 associated project partner countries. According to the official EU definition, SMEs can be identified based on staff headcount and turnover or balance sheet total (European Commission, 2021). Table 3 below provides an overview of the characteristics used to determine the size of an enterprise.

**Table 3. SME definition**

Company category	Staff headcount	Turnover	Balance sheet total
Micro enterprise	< 10	Less or equal 2 million Euro	Less or equal € 2 million
Small enterprise	< 50	Less or equal 10 million Euro	Less or equal 10 million Euro
Medium-sized enterprise	< 250	Less or equal 50 million €	Less or equal 43 million €

Source: European Commission, 2021

## **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.

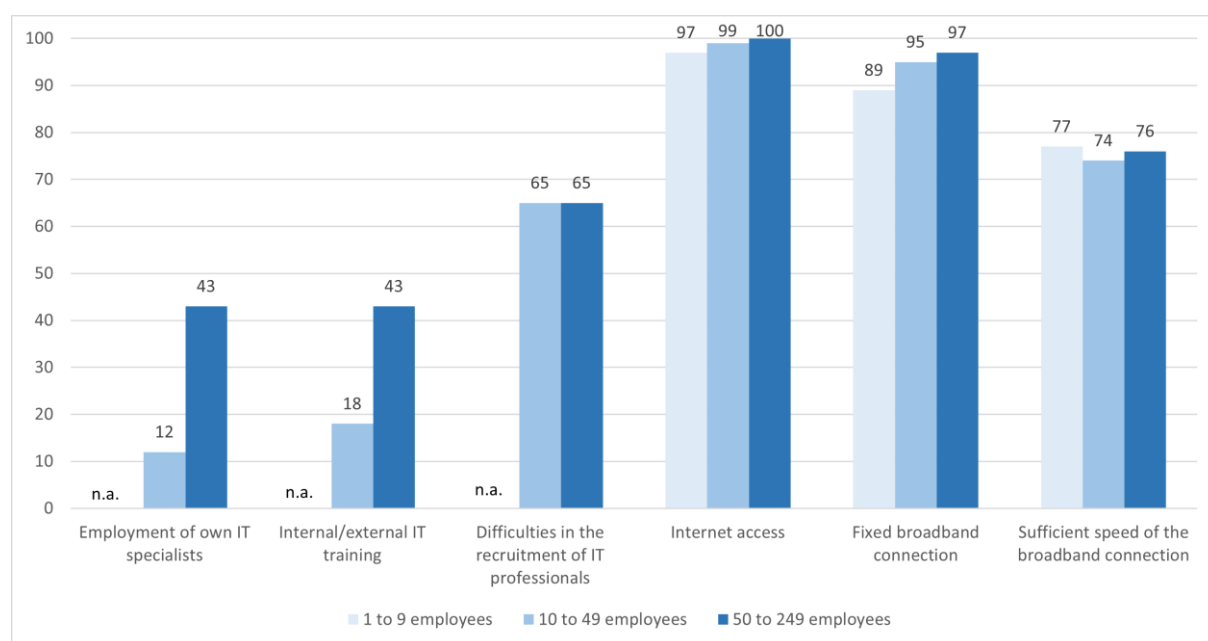
### **Framework conditions for the implementation of digital customer-based innovation: Case studies – Germany**

When looking at the digital infrastructure in Germany, it can be noted that almost all SMEs in Germany have access to the internet. Only among microenterprises have 3 percent of SMEs and 1 percent of those with 10 to 49 employees stated that they do not have internet access. This means that the biggest external barrier to the realization of customer innovation via digital tools has been passed (see figure 1). A similar result can be seen for the availability of a fixed broadband connection. Here, too, the proportion of micro enterprises is lowest at 89 percent, followed by the medium size category at 95 percent. 97 percent of SMEs with 50 to 249 employees have a fixed broadband connection. However, SMEs' assessments of the quality of the digital infrastructure point to potential for improvement. For example, the available speed of the broadband connection for the activities of microenterprises is most satisfactory (77 percent rate the speed as sufficient).

Furthermore, the examination of the framework conditions also shows that less than half of the SMEs employ their own IT specialists. There are clear differences between the company size categories. While 43 percent of large SMEs state that they employ IT specialists, this is the case for

only 12 percent of SMEs with 10 to 49 employees. The shortage of skilled workers often discussed in the literature is confirmed by SMEs irrespective of employment size classes. 65 percent of SMEs stated that they had experienced difficulties in hiring IT specialists in 2020. While 43 percent of large SMEs were able to compensate for this skills shortage through internal and/or external IT training, only 18 percent of SMEs with 10 to 49 employees had this opportunity to bring the required expertise into the company. Different continuing education formats can serve as a sustainable way to acquire basic knowledge.

Figure 1 Framework conditions for digital customer-based innovation in Germany, 2020, in %



Source: Federal Statistical Office (2021) ICT indicators for companies: Germany, years, employment size classes

## **Applied info-communication tools and technologies supporting business processes in SMEs**

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As part of the project "Digital methods, toolbox and trainings for increasing customer innovation in SMEs" (ICIinSMEs), research and surveys were conducted in the project countries. These led to the following results with regard to info-communication tools and technologies supporting business processes in SMEs.

Using digital technologies and tools, respondents were able to mark multiple options at the same time. Nine of the ninety-five respondents did not indicate any options for using the listed tools and technologies. Sixty-three respondents indicated Internet use and fifty-nine marked the corporate website. Internet use is a general category, but it includes some other options (e.g., corporate website, cloud-based solutions). There were respondents who marked the latter while not using the Internet. This indicates that full, accurate information on the listed options has not yet been developed. The following technologies and tools are present in a relatively large number of responding organizations (20-28%): cloud-based solutions, digital platforms, project management tools, mobile banking, customer relationship management systems (Figure 6).



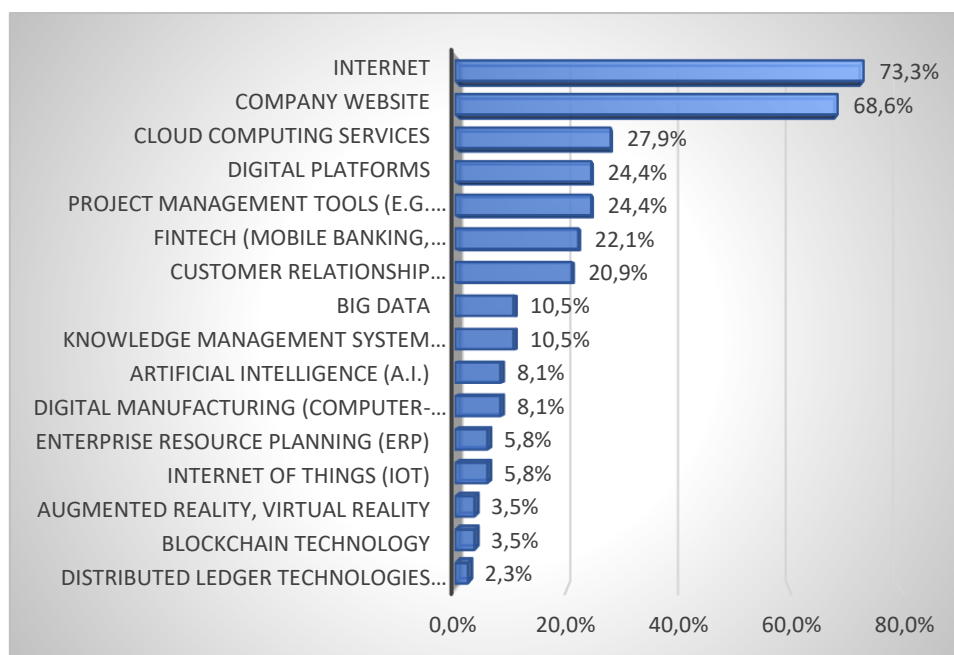


Figure 1 Applied info-communication tools and technologies supporting business processes

Correlations between the number of employees and the tool and technology used were examined. The proportions are similar to those for the whole population. Of the fifty-three organizations with less than ten employees, thirty-eight indicated Internet use and thirty-one indicated the corporate website. IoT and virtual solutions did not appear in either case. For organizations with ten to fifty employees, twelve out of fifteen respondents and nine indicated Internet use as the corporate website. IoT, blockchain technology, and shared accounting are not at all typical of these organizations. For organizations with between fifty-one and two hundred and fifty employees (eight), they use 100% of the Internet and the corporate website. Organizations that employ more than two hundred and fifty people (ten), these two tools appear in eight cases.

Big data, knowledge management systems, artificial intelligence (digital manufacturing), enterprise resource planning, the Internet of things, augmented reality, virtual reality, blockchain technology, and distributed ledger technologies have appeared in two to nine cases for all responding organizations, which means small proportions overall, but draws attention to the fact that there are also some relatively new and/or specialized solutions. demand in most sectors and company sizes.

Table 1 Info-communication tools and technologies used by countries

	Denmark	Germany	Hungary	Poland
Internet	61.5%	72.0%	89.5%	84.6%
Company website	84.6%	96.0%	31.6%	38.5%
Cloud computing services	23.1%	44.0%	21.1%	0.0%

Digital platforms	69.2%	24.0%	15.8%	7.7%
Project management tools (e.g., Slack, Microsoft 365)	38.5%	40.0%	10.5%	0.0%
Fintech (mobile banking, crowdfunding and online payments)	23.1%	32.0%	10.5%	15.4%
Customer relationship management (CRM)	38.5%	24.0%	0.0%	7.7%
Big data	15.4%	12.0%	5.3%	0.0%
Knowledge management system (KMS)	7.7%	24.0%	0.0%	0.0%
Artificial intelligence (A.I.)	0.0%	8.0%	5.3%	7.7%
Digital manufacturing (computer-controlled manufacturing processes, 3D printing, robot technology)	7.7%	12.0%	0.0%	0.0%
Enterprise resource planning (ERP)	0.0%	12.0%	0.0%	0.0%
Internet of things (IoT)	7.7%	12.0%	0.0%	0.0%
Augmented reality, virtual reality	7.7%	4.0%	0.0%	0.0%
Blockchain technology	15.4%	0.0%	0.0%	0.0%
Distributed ledger technologies (DLTs)	0.0%	0.0%	5.3%	0.0%

We analysed the country data for the four most respondents regarding the technologies used (Table 1). The colours used in the table were designed according to the following frequencies: 0%; 0-6%; 6.1-11%; 11.2-25%; 25.1-35%; 35.1-45%; 45.1-65%; 65.1-85%; 85.1-100%. The use of the Internet is the most typical in Hungarian and Polish organizations, and the corporate website in German and Danish organizations. Low-frequency devices and technologies (e.g., IoT, digital production, virtual reality) are more present in German and Danish organizations, their frequency is typically 0% in Hungarian and Polish organizations.

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

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As part of the project "Digital methods, toolbox and trainings for increasing customer innovation in SMEs" (ICIinSMEs), research and surveys were conducted in the project countries. These led to the following results with regard to 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 7).

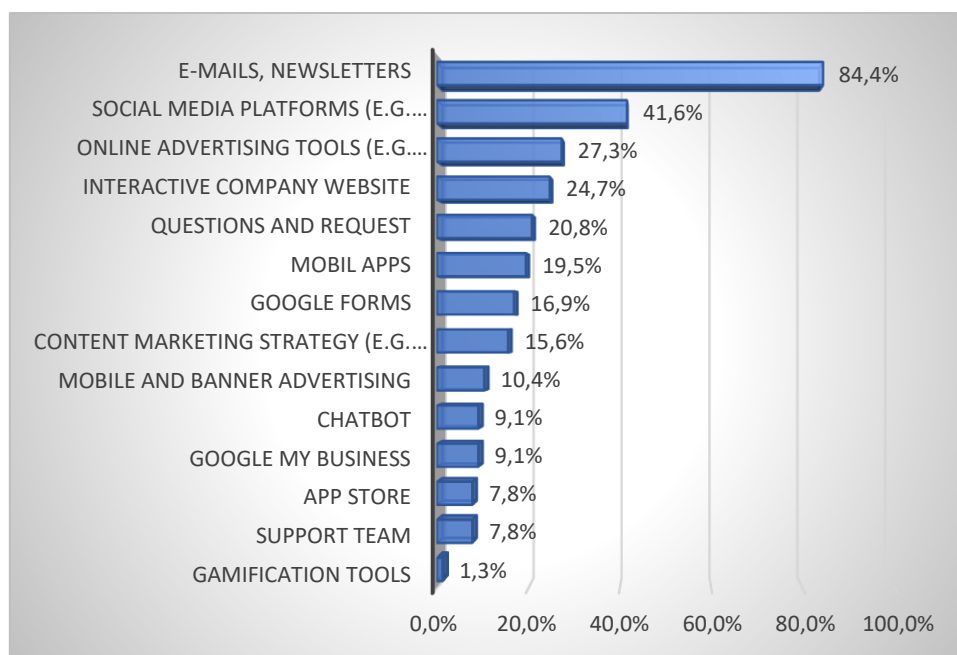


Figure 2 Means of communication used

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 2 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.