

INNOVATION OF SMALL AND MEDIUM ENTERPRISES IN TIMES OF COVID-19

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Purpose: The study explores how the disruption caused by Covid-19 has influenced the innovativeness of small and medium enterprises (SMEs) in Poland. It aims to show the examples of innovative ideas introduced by SMEs in times of pandemic to overcome the obstacles that appeared due to fluctuations in the demand and supply because of Covid-19.

Design/methodology/approach: The study draws on a qualitative research design and uses case studies. We chose three small and two medium-sized Polish firms specializing in different business areas for analysis.

Findings: The analysed organizations due to Covid-19 introduced innovations mainly focused on IT solutions. All of the firms have begun to offer remote work. Moreover, they implemented a new work organization system and a new customer service system. In all cases, the new solutions will be maintained and developed after the end of the pandemic.

Research limitations/implications: The study uses five case studies.

Practical implications: The outcomes of the study can motivate entrepreneurs to implement innovations as the case studies may inspire them. Moreover, the successes of presented SMEs may convince entrepreneurs that introducing innovations is not difficult and that the effects of innovative changes are measurable and visible in a short time. Thus, they may be encouraged to take action to overcome obstacles in their surroundings.

Originality/value: The study develops the knowledge concerning the innovation process in companies in an uncertain, unstable and unpredictable environment.

Keywords: product innovation, process innovation, small and medium enterprises, SMEs, Covid-19.

Category of the paper: Research paper.

1. Introduction

Covid-19 has impacted businesses worldwide, causing some companies to be closed and others to grow (Foss, 2021). The changes in demand and supply and the new needs of customers and business partners that emerged in the pandemic left many companies on the edge of bankruptcy. The challenging market situation and threat to business goal achievement required firms to make quick decisions and manage efficiently (Gopalakrishnan and Kovoov-Misra, 2021). Thus, entrepreneurs were highly motivated to look for new opportunities for survival and growth. Many firms responded to the changes brought about by Covid-19 by using creativity in problem-solving to achieve market viability (Thukral, 2021). As a result, some innovated (Adam and Alarifi, 2021; Caballero-Morales, 2021) and developed business risk-taking behaviours (Cepel et al., 2020).

Studies are revealing that due to the pandemic, some companies have introduced new products or services (Liguori and Pittz, 2020; Sarkar and Clegg, 2021). Likewise, research shows that Covid-19 caused some firms to modify their market offer or change how they operated during the pandemic (Bloom et al., 2021). However, knowledge of firms' innovations implemented because of Covid-19 is limited, and still, there are many cognitive gaps in that field. This study enriches that knowledge by exploring how the disruption caused by Covid-19 has influenced the innovativeness of SMEs. It aims to show the examples of innovative ideas introduced by SMEs in times of pandemic to overcome the obstacles that appeared due to fluctuations in the demand and supply because of Covid-19. Moreover, it identifies the main drivers of SMEs' innovation in times of Covid-19, the principal challenges of managing these innovations, and their results. In particular, the study seeks to answer the following related research questions:

- Q1: How the disruption caused by Covid 19 has influenced the innovativeness of SMEs?
- Q2: What changes caused by Covid-19 were the main drivers of SMEs' innovation?
- Q2: What kind of innovation was introduced by the company to face challenges caused by Covid-19?
- Q3: What were the principal challenges of managing innovation in times of Covid-19?
- Q4: What were the main effects of innovations introduced in SMEs because of Covid-19?

Qualitative research was used to reach the goals adopted for the study and to answer the research questions. The data were gathered in Poland.

2. SMEs and their innovation behaviors in times of pandemic

The pandemic caused by Covid-19 has had an unprecedented impact on many industrial sectors (Wojnicka-Sycz et al., 2022). Due to numerous employee and customer illnesses and pandemic restrictions, many companies were forced to make significant organizational changes. Some even had to change key elements of their business models entirely (Guckenbiehl and Corral de Zubielqui, 2022). However, there were also such firms that have made only minor adjustments to the market conditions. Nevertheless, even these companies had to adapt to an entirely new perspective.

Covid-19 has caused all businesses could not familiarize themselves slightly with a new market situation; instead, they had to think about the solutions under extreme time pressure. Thus, due to the 'liquid' nature of the environment (Zamani et al., 2022), companies, regardless of their size and location, had no time to analyse the appearing challenges carefully.

Innovation is imperative for organizational survival and success (Steinerowska-Streb and Głód, 2020), particularly in turbulent market surroundings (Lee and Trimi, 2021). Thus, in the Covid-19 environment, many companies decided to introduce innovations to adjust to customers' new needs and the low regulations that have been changed because of the pandemic (Adam and Alarifi, 2021; Liguori and Pittz, 2020; Sarkar and Clegg, 2021). Small and medium-sized enterprises (SMEs) were among these companies (Adam and Alarifi, 2021; Alraja et al., 2022; Clauss et al., 2022). Some of them implemented innovations, despite their specific characteristics compared to large firms: capital shortages, lack of human resources, limited managerial capacity (procedures, techniques, and tools), limited capital resources, and no knowledge management (Klein and Todesco, 2021).

Some research demonstrates that Covid-19 encouraged SMEs to implement product and process innovations (Liguori and Pittz, 2020; Sarkar and Clegg, 2021). Moreover, little evidence shows that the pandemic has primarily become the driving force behind introducing IT solutions to SMEs, such as: creating a website and social media channels for marketing and sales or implementing communication solutions in the home office (Szarucki et al., 2021). These digital innovations have helped SMEs adapt to market changes in times of Covid-19 and overcome the difficulties of a pandemic. Importantly, in many cases, the digital solutions implemented because of Covid-19 began to function naturally in the daily business practice of SMEs even after the pandemic had subsided (Almeida et al., 2021).

Previous scant research on SMEs' innovation practices in response to the COVID-19 pandemic also found that revisiting their existing business model for some SMEs became necessary to minimize the negative consequences of the pandemic (Guckenbiehl and Corral de Zubielqui, 2022). Additionally, these studies reveal that the activities of SMEs in the new modes allowed them not only to survive but sometimes also to benefit (Brzeziński et al., 2021). However, the knowledge about SMEs' innovations remains incomplete and inconsistent,

and therefore there is a need to conduct research concerning innovations introduced in SMEs due to the pandemic.

3. Methodology

The study examines how the disruption caused by Covid 19 has influenced the innovation of small and medium enterprises (SMEs) in Poland. Hence, empirically, it explores a new yet not fully recognized field. It draws on a qualitative research design and uses case studies considering its exploratory nature. We selected this research method because case studies answer to the 'how' question and are considered the best for explaining processes in companies (De Massis et al., 2014).

The selection of enterprises for the sample was purposeful. Only those companies were chosen for the study that implemented at least one innovation in products/services and/or production/service processes during 2019-2021. Importantly, this innovation had to be made in response to changes in the market caused by Covid-19. Moreover, two criteria were used to select the company for the case study: 1) the size of the company (small or medium), and 2) the type of activity that the company conducts (trade – the retail or wholesale trade sector, manufacturing, service). The size of the enterprise was distinguished based on the employment criterion. The thresholds used to determine the enterprise size have been taken from the European Union recommendations for defining micro, small and medium-sized enterprises (European Commission, 2003).

Five companies functioning in the Polish market participated in the study. The number of case studies thus ranged from four to ten, which is recommended in this type of research for methodological and pragmatic reasons (Czakoń, 2006). Three SMEs participating in the study were small-sized firms, and two were medium-sized firms. Among the small companies, there was one trading company, one service company, and one involved in trading, manufacturing, and services simultaneously. Among the medium-sized firms, one specialized in trade, manufacturing, and services; the other was a service provider.

The information about chosen companies was gathered from two sources. First, the data about each company were taken from their websites. Then, the interviews with the top managers representing chosen companies were conducted. The interviews were made in 2021 and at the beginning of 2022 and lasted between 45 and 60 minutes. The interview recordings were transcribed and then analyzed using QDA Miner 5.0 software.

4. Results

4.1. Case 1: Small service company X

X is a family company operating market for ten years. It is a small firm with 40 employees and deals with freight forwarding and transport between European Union countries, especially Poland, Spain, England, Germany, Italy, and France. However, it also cooperates with Bulgarian, Ukrainian, and Romanian partners.

The company regularly innovates. One of the company's leading innovations in recent years has been the introduction of geolocation. Its manager says: "Without innovation, we would not exist because the industry is growing very fast, and there is much competition."

Covid-19 contributed to the replacement of stationary work with remote work and the reorganization of the whole company: "We figured it [remote working] might make sense, well we tried it, it worked for us in some ways. Then, when more and more people saw that it was effective, they wanted it, and we started to use it [...]. We did it very gradually [...]."

The biggest problem that after introducing the remote work appeared was employee control. The company solved this problem by introducing innovative software to monitor the work of employed people: "[...] we bought such a program Axence, [...] which controls employees – we can see what and when the employee is doing, we can control employees and peep, appropriate printouts, etc., from which sites... We can also block sites because, for example, they were tempted by some other sites there [...]."

The introduction of remote working has increased efficiency: "it [remote working] is very effective. Employees work at different times of the day [...]. Sales are round-the-clock, even on Saturday, and not just from 8 a.m. to 4 p.m. as before (which was very inconvenient to at least check). Customers send in their transport needs, and employees find the carrier and sell orders on Saturday. I even saw that on Sunday, an employee also sold such an order".

Additionally, remote working has reduced in the company's costs: "[...] we also reduced many costs because we recently moved into a new office. The office we occupied was huge, and with this innovation of remote working, we just reduced that space and costs. Much cash stayed in the company".

Although the pandemic significantly impacted the company's profits, over time, the company has stopped feeling the effects and intends to maintain the solutions introduced during Covid-19.

4.2. Case 2: Small trade company Y

Company Y has been trading the articles from the wood industry for 15 years. Mainly these are articles for further processing, such as wooden beams. However, the company also offers floor panels, moldings, various door frames, and doorframes. In addition, the company

intermediates in selling wooden products. On customer request, it creates some elements for furniture.

The pandemic has increased the company's running costs and has affected restrictions on turnover and the movement of goods. According to the company's co-owner, the stationary shop's turnover is still less than before the pandemic. However, the company owners are proud that no one has been fired because of the drop in turnover. Due to the pandemic, the company's website has been improved, and customer service and warehouse operations have been modified. Many activities in this area started to be handled online thanks to implementing new customized software for the company. One of the most important effects of the new IT system is the ability for customers to place and process orders electronically: "A customer service system was developed according to our order [...]. Previously, we had only used ready-made solutions, which did not quite fit the specifics of our company. It [The new system] was made so that transmission is coded. We have VPNs, and company representatives can connect, e.g., from a car or a client's company. Moreover, the transmission is safe, but also visible".

Another innovation caused by the pandemic was the introduction of remote office work, which was implemented in those areas where possible. The responsibilities of employees in certain positions were also changed, and some organizational changes were made. Consequently, personal contact between the employees was reduced: "Now we have one system where you can record what an employee has to do during the day. It also registers the contacts with the customer. Moreover, it shows all the logistical chains concerning the goods coming to us and going out from us. We also have stock levels in the system automatically filled in. It led us to adapt to the changes caused by the pandemic because it gives access to this from home". "Thanks to all these changes, we could work all the time. Now agents can stay away from the company for weeks and react flexibly to orders and demand".

Thanks to the new solutions, productivity has increased considerably, and order processing time has been shortened. Furthermore, the introduced changes have contributed to greater coordination of the activities of individual units of the company and improved control of employees. They also positively influenced the satisfaction of employees and customers. Although the changes were time-consuming, the company manager says that the introduction of innovations was effective, and the company intends to develop further in this area.

4.3. Case 3: small service, trade, and manufacturing company Z

Company Z has been in business for 28 years. Initially, it specialized in organizing concerts. Today, the company's offer has expanded to include other types of events, such as cabarets or conferences. Before the pandemic, these were exclusively stationary events, and since March 2019, the company has started organizing online events. When all the events and concerts were cancelled, the company created its webinar system within a week. It started using it to organize events: "We were already able to sell conferences after just one week. [...] within maybe ten days, we were up and running for that".

The most significant advantage of the system created by company Z is that there is no need to install the software on computers to attend an event. When it was recognized by various market players such as universities, the sales of this system began.

Thanks to introducing an innovative software system, the company expanded its scope of activity, doubled its workforce, gained popularity, and built an image of a modern company: "Suddenly we could not keep up with answering the phone – all the conferences, training sessions".

Observing the present company's activities, one can notice that the firm responds quickly to all customer needs and suggestions: "if a customer has above-standard expectations, we can quickly introduce them into the offer so that he has them." Considering that it can be expected that the innovations made by the company because of Covid-19 will be further improved.

The business owner is fully aware that the company has managed to turn a market threat into an opportunity. He states: "If it were not for Covid, we probably would not have introduced any such innovation because we would not need it".

4.4. Case 4: medium-sized trade, manufacturing and service company U

U is an international company functioning for over 15 years in the environmental protection sector. It provides environmental consulting services, collects and processes industrial waste, and sells semi-finished products derived from processed waste. It currently operates in Poland, France, Hungary, and Saudi Arabia. The company regularly introduces innovations. At the beginning of 2019, such an innovation was a modern technological line that made it possible to obtain an intermediate product from plastics, which the company sells. Another innovation was a system for utilizing rainwater.

The pandemic initially affected the company's turnover and profits. It also caused the company to postpone the opening of further divisions. To increase turnover and profits, the company decided to change the way of providing services to customers. Before Covid-19, customers were served by company representatives, which took place at the customer's office. After an initial meeting, an offer was prepared for them. After the pandemic began, a new IT system was introduced to reduce direct contact between the transaction parties. Thanks to that new solution, the customer can locate all the information needed by the company on the website. This system also enables the company to continue working with the customer on an ongoing basis and make new offers based on the customer's data. The director describes this innovation as follows: "in connection with this pandemic, we had to change this IT system to one more pro-client [...]. We wanted to tighten contact with clients differently than face to face. So we created a kind of subsystem connected to our green route, which we call it. In larger companies, the customer has a connection to our system – they enter, for example, the collection dates that suit them, data on how full the containers are".

The effects of this solution have proved to be beneficial for both the company and the customers. It has improved the flow of information between the parties of the transaction, making the whole cooperation easier and speeding up waste collection: "We have an overview of this, and it is easier for us to work with the customer. The customer is also delighted because he has to pay less attention to it".

The change in cooperation with customers has also forced the company to take a different view of the market and further development. Therefore, the company has created new jobs to analyze market changes. In addition, the number of sales staff has been reduced. The main problem experienced by the company in connection with the change in customer communication concerned the difficulty of integrating the IT systems used.

4.5. Case 5: medium-sized service provider W

W is a medium-sized company operating for ten years in the telecommunications industry specializing in organizing out surfing, offering its services, and trying to win customers. Its services focus on setting up call center services and its comprehensive maintenance. Currently, the company operates in the Polish market.

During the pandemic, the company's turnover decreased. In addition, the company began to experience problems with customer acquisition. Innovations introduced by the company due to the pandemic concerned two areas. One was the introduction of new evaluation forms for customers, which were created according to customer guidelines. IT specialists merged this form with the company's software, and reports are based on it. The second new solution introduced by the company during the pandemic was the implementation of remote working. Employees began running the company's programs from home. In contrast, previously, everyone performed their duties exclusively at the company's headquarters: "We all worked Monday to Friday normally in the office, from 8 am to 4 pm".

The company's problems with introducing remote working were mainly related to employee control, which was solved by introducing the new software. However, remote working caused a reduction in costs: "costs could be reduced because the company did not need to have an office space, or at least not the same size as before. Renting a nice office is a huge cost, especially in the center".

Although the company had grown and had no plans to downsize its office, the solutions introduced in the pandemic encouraged it to give up much of its office space and maintain remote working.

5. Findings and discussion

The results of the study show that SMEs participating in the study modified their market offer or changed their way of operating in response to the market changes caused by the pandemic (Table 1).

Table 1.
The main findings from case studies

Characteristics of the company	The impact of the pandemic on the company's business operations	Type of innovation introduced as a result of Covid-19	Effects of innovation in the short term
Small service company	Drop-in turnover The need to limit direct contact between employees The need to limit direct contact with customers	Remote work New IT system of work employees' monitoring based on a software Change of remuneration systems to a commission system	Increase in the effectiveness Increase in sales Cost reduction
Small trade company	The pandemic has increased the company's running costs and affected restrictions on trade and the flow of goods.	Creation of a website Implementation of new software with 3D technology New remote customer service system Remote work system	Increase in work efficiency Shorten the lead time of orders Increase in customer satisfaction Maintaining market share
Small trade and service company	Loss of orders Inability to provide services in the current formula	Creating of webinar system	Change in business model Extension of the offer to sales Development of a product for other organizations (e.g. universities) Quicker response to the customer needs
Medium trade, production and service company	The need to limit direct contact with customers	A new IT system for customer service and calculation of offers. Creation of jobs (worksites) aiming at the analysis of market trends.	Increase in customer satisfaction Improvement of the flow of information Cost reduction
Medium service company	Activity in an innovative market; the need to acquire new customers A decrease in turnover	Introduction of a customer assessment form Integration of IT systems Remote work	Cost reduction Maintaining market share

Source: Own elaboration.

The analysis of the results reveals that innovations introduced by SMEs in times of Covid-19 were primarily focused on digitalization. Companies have mainly implemented the new software to reduce direct contact between employees or between employees and customers. Generally, the implementation of IT solutions has led to a reorganization of production

processes, modifications in companies' logistic systems, and the introduction of remote work. These changes have often resulted in reduced office space and company operating costs. Moreover, some SMEs changed incentive systems, and new methods of controlling employees were introduced.

Digital innovations were also implemented in SMEs to improve the communication between companies and customers and enable clients to place orders online. The improvements made for that aim to companies' websites have usually contributed to higher turnover for businesses and increased customer satisfaction.

However, it is important to note that SMEs participating in the study also implemented organizational and management changes. One of the five SMEs made even significant changes to its business model. With this transition, the company has expanded its business profile and increased its size considerably. Nevertheless, without the business model's modification, the company's further existence would not have been possible.

The main innovation management challenge during Covid-19 was for SMEs the need to quickly implement new solutions and take prompt corrective management actions. This approach enabled SMEs to adapt smoothly to the new reality and maintain business continuity.

Summing up the study's findings, it can be concluded that Covid-19 affected SMEs' innovation. Such results of the study are in line with previous studies on innovation practices of SMEs during the pandemic (Adam and Alarifi, 2021; Guckenbiehl and Corral de Zubielqui, 2022; Liguori and Pittz, 2020; Sarkar and Clegg, 2021).

6. Conclusions/Implications/Limitations

The analysis of the case studies reveals that the disruption caused by Covid 19 influenced the implementation of innovative solutions in SMEs. Limited face-to-face contact opportunities between employees and customers became a major driver for SMEs to introduce product modifications and process innovations. These include remote working, remote employee control, new or modernized IT logistic systems, and creating websites that fully allow customers to explore the firms' offerings and place orders online. Thanks to these innovations, SMEs could present their company's offer alternatively or contact customers differently than in the past. They also enabled SMEs to organize the safe work of employees. Consequently, process innovations have allowed SMEs to keep their processes running smoothly and reduce operating costs. Additionally, in many cases, the implemented changes led to an increase in the satisfaction of both customers and employees. Importantly, all the mentioned effects were visible even in a short time.

By showing examples of innovation introduced by SMEs in times of pandemic, the study develops the knowledge concerning the innovation process in companies in an uncertain, unstable, and unpredictable environment and contributes to the literature on entrepreneurship. An essential added value of the study is that its outcomes can motivate entrepreneurs to implement innovations as the case studies may inspire them. Furthermore, the successes of presented SMEs may convince entrepreneurs that introducing innovations is not difficult and that the effects of innovative changes are measurable and visible in a short time. Thus, they may be encouraged to take action to overcome obstacles in their surroundings.

The results of this study should be interpreted keeping in mind that it has some limitations. Firstly, the study presented in the article is limited to the presentation of a few selected case studies. Therefore, the results of the study cannot be generalized. Secondly, all case studies concern small and medium-sized enterprises and do not include micro-enterprises. Finally, the study was conducted only in Poland. In other economies that were restricted by other constraints during the pandemic, SMEs may have innovated differently during Covid-19.

Future research should develop the knowledge about the innovation of micro-enterprises in times of Covid-19. These studies should not be limited to qualitative research but should also be quantitative. In the future, the long-term results of the innovations introduced by SMEs during the pandemic could also be determined. Additionally, separate analyses can be conducted to implement product and process innovations.

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