

# **Digital transformation and its importance in the development of small and medium enterprises in the manufacturing industry in different blocks of BM canvas since the beginning of the pandemic**

**By**

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## **Abstract**

**Purpose**–The purpose of this study is to conduct an analysis of the progression of digital transformation in small and medium-sized enterprises (SMEs) operating in the manufacturing sector from the beginning of the epidemic. The numerous components of the BM Canvas are used to conduct an evaluation of the digital transformation. The primary purpose of this study is to analyze the effect that the pandemic had on the progression of digital transformation and to determine whether or not it is still having an effect on it at the present time, whether it is having an influence on it today. **Research methodology** – The digital transformation is investigated in each section of the Business Model Canvas (BM Canvas), starting with the beginning of the epidemic and moving forward to the present condition. Individual data were acquired via a survey that was administered to a total of 18 SMEs. The focus of this investigation is on both large and medium-sized companies operating in the industrial sector. The poll is based on interviews that were semi-structured and conducted with management representatives from SMEs. After the data have been acquired, they are processed by looking at the average rate of digital transformation in each block, as well as the norm and the median. Once again, the emphasis was placed on recent advances and shifting trends in the digital transformation of businesses. The information was gathered for three different time periods: before the epidemic (in 2019), during the pandemic (in 2021), and right now (in July 2022). **Findings** – The report demonstrates how digital transformation has progressed over time in the various building elements of the BM Canvas for SMEs operating in the manufacturing sector from the beginning of the epidemic. Different BM Canvas blocks will have different trajectories of progression for digital transformation. Since July 2022, there has been a slowdown in the overall pace of digital transformation being implemented throughout the Channels block. The growth of the other blocks has been seen, and they will continue to expand. Nevertheless, the gains are not as significant as they were in 2021

**Keywords:** Business Model Canvas, digitalization, SMEs, COVID-19, digital transformation.

## **Introduction**

Not only has the worldwide COVID epidemic had an effect on people' physical and mental health, but it has also had an effect on the financial health of enterprises. As a result of Pandemic, there was a growth in digital transformation, "changes in customer behavior, and a lack of management and technology competence to solve these concerns (Klein & Todesco, 2021). (Gregurec et al., 2021) Small and medium-sized businesses (SMBs) are altering their business strategies to accommodate the changing environment. (Cha et al., 2015; Li et al., 2018) The digital transformation of small and medium-sized businesses (also known as SMEs)

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is now a hot subject of discussion among both academics and industry professionals. Technology not only provides competitive benefits, but also the ability to survive by improving upon current company structures (Akpan et al., 2021). This is evidenced by the use of cutting-edge technology to manage business operations during the involuntary closure of a community to prevent the spread of the COVID-19 pandemic.

The objective of this study is to investigate how small and medium-sized enterprise (SME) manufacturers have adapted to the rise of digital technology from the beginning of the epidemic in the different components that make up the BM Canvas. In addition to this, an analysis will be done to determine how diverse the different aspects of the digital revolution are. The Business Model Canvas was chosen as the appropriate theoretical foundation for this investigation in line with Osterwalder and Pigneur's (2010) recommendations. The research will contribute to the development of new understandings and insights on the pace of digital change for each component of the BM Canvas.

## **Review of literature**

The progression of digital technology is becoming an increasingly important subject for companies. According to Dethine et al.'s research from 2020, small and medium-sized businesses want to participate in a comprehensive digital planning approach globally. (Viswanathan & Telukdarie, 2021) The realm of technology innovation provides chances to optimize a variety of difficulties, including the management of small and medium-sized enterprises (SMEs) during pandemics. According to Chatterjee et al.'s research from 2021, small and medium-sized enterprise (SME) owners and operators that deploy digital technology systems are able to develop instantaneous contacts not just with their customers and suppliers but also with other stakeholders.

In a research article that was published in 1957, Bellmann and his colleagues were the first to present the idea of a Business Model (BM). After then, a great number of research articles and scholarly papers on the topic of business models were written (Osterwalder et al., 2005; Teece, 2010). The works of Linder and Cantrell (2000), Osterwalder (2004), and Chesbrough (2006), amongst others, have been recognized as being among the most impactful. According to Foss and Saebi (2017), the study of business models has seen significant expansion, reaching 7391 papers that are indexed in Scopus between the years 1980 and 2015. Despite the fact that Sandberg (2002) and Verstraete and Jouison-Lafitte (2011) remark that the idea of a corporate strategy tackles broad, basic, and well-known challenges of a strategic nature, there is still controversy about what these models of business are and their value. It was necessary to have the concept of a business model in order to recognize e-business as well as the commercialization of technology and innovation (Amit & Zott, 2001; Chesbrough & Rosenbloom, 2002; Johnson, 2010; Zott et al., 2011). In his analysis of unethical business practices on the internet, Porter (2001) came to the conclusion that the opacity of business models "invites faulty thinking and deception." According to Osterwalder and Pigneur (2010), a Business Model (BM) is a graphical depiction of how a firm accomplishes its strategic goals, while outlining nine major components, also known as building blocks, for its design. Additionally, a BM includes a description of the relationship between these components.

According to Yrjola et al.'s research from 2020, existing sectors are now experiencing a fast transition as a consequence of the adoption of digital business models. Because of the impact that digital transformation has had, business models need to be rethought and reimaged. According to Parida et al. 2019 and Bouwman et al. 2019, small and medium-sized

enterprises (SMEs) do not have enough time to experiment with their business models and start adopting new strategies. According to Mostaghel et al.'s research from 2022, the pace of technological progress during the COVID-19 pandemic saw a considerable spike. (Priyono et al., 2020) Businesses are making efforts to combat the effects of the worldwide pandemic by initiating the process of transforming their business models via the use of digital technology.

As stated by Verhoef et al. (2017), digital transformation is an all-encompassing approach that involves changes made throughout a whole company and calls for the development of new Business Models. The pandemic is causing a tremendous acceleration in the pace of digital transitions that enterprises are undergoing. Although some businesses have jumped ahead of the pack in the digital transformation race, others are falling farther and further behind due to the difficulty of the change (Abbu et al., 2022). More important to the process of digital transformation than digital technology themselves are people. Changes in the organization are required, with the backing of leadership, and are caused by serious challenges to the culture of the firm. (Gudergan et al., 2019; Abbu et al., 2020; Mugge et al., 2020) The leaders of businesses need to develop trust in order to prepare for the digital revolution.

## **Methods and design of research**

The purpose of this paper is to examine the development of the digital evolution of small and medium-sized enterprises (SMEs) in the production industry in the various construction components of BM Canvas. The status is monitored prior to the onset of the global epidemic (2019), during the pandemic (2021), and currently (July 2022). This study is a continuation of research conducted in 2021 that investigated the impact of the digital age on the BM Canvas of SME manufacturers. The outcomes demonstrate that the development of digital change varies from block to block, but exhibits an upward trend. The researchers consequently examine if the upward trajectory persists. The evaluation relies on study carried out on eighteen manufacturing-related SME samples. This investigation is accompanied by interviews with executives from each company. Eighteen manufacturing industry SME executives participated in semi-structured interviews. First, they were prompted to provide an approximate evaluation of the extent of digital transformation across the total organization, and then they assessed each block separately. Following this, it was discussed in which domains of digital change had had the greatest influence.

The emphasis is on the examination of advances and shifts of digital transformation in the global epidemic period, especially on how all of the components respond to electronic transformation and whether changes react correspondingly throughout building blocks or at a significantly different level. Monitored are the mean amount of digital transformation in every structure block, the mode and median, as well as the increase since the outbreak began. The survey itself included management representatives from 18 selected organizations.

Small and medium-sized enterprises in the manufacturing sector. The extent of the digital shift was evaluated by the chosen companies' own executive members. Each participant decided his company's level of digital transformation and then decided the level of digital change in every section of the BM Canvas. The researchers then compiled and combined the data before determining the mode and median. Additionally, they calculated the intervals between periods. The findings from the poll provide an initial basis for analyzing the development and modifications of the BM Canvas in the context of the digital shift for these organizations. Since the onset of the pandemic, the authors analyze the development of digital change in every structure element.

## Research findings/results

The current section provides the findings of a study that concentrates on the development of digital change since the onset of the COVID-19 pandemic in the different components of the BM Canvas among SME manufacturers. Regarding digital transformation, each component of the BM Canvas is analyzed independently. Individual levels of digital transformation are evaluated across three time periods: the time before the pandemic (2019), the time when it began (2021), and the present (July 2022). As comparable factors, the average, mode, and median are employed. The findings provide a summary of the modifications to the various components of the BM Canvas for SMEs.

## Customer segment

Since the beginning of the pandemic, the pace of digitization within the consumer group is still rising. This was stated by 61.1% of small and medium-sized enterprises. 38.9% of SMBs report that they have stopped modernizing this sector or that their digital evolution has stalled. Prior to the pandemic of 2019, the average rate of technological change was 31.7%. During the pandemic of 2021, the prevalence was 56.61 percent, while companies reported a median digital shift rate of 67.5 percent. This represents an increase of 35.86% during the pandemic period. The method has a present level of 90%; prior to the pandemic, its values were 30%, 50%, and 60%; and in 2021, they were 60% and 80%. The median has increased by 41% since the beginning of the pandemic, and is now 71%. Table 1 beneath gives an overview of the chosen digital consumer segment indicators.

**Table 1.** Provides a summary of the setting, the mean, and typical digitization rates for the consumer block (source: authors, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021-2019)</b>	<b>Now (2022)</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019-2022)</b>
Mode	30%,50%,60%	60%,80%	X	90%	X	X
Median	30%	60%	30%	71%	11%	41%
The average rate of digital transformation	31.7%	56.61%	24.91%	67.56%	10.95%	35.86%

The creation and finalization of an online customer record was the most frequently cited effect of the digital shift in this subdivision. During the pandemic, such databases began to emerge; now, businesses have created them. These tools help manufacturers monitor their consumers and interact with them more effectively. Businesses are additionally linking these platforms to their communication platforms and e-commerce sites.

## Value proposition

In addition, the Value Proposition block revealed an increase in digital transformation. Here, 61.1% of companies reported a change in the rate of digitization. There has been no or limited shift in the pace of digitization, according to 38.9% of companies. The current average rate of digital transformation is 63.28 percent, a rise of 15.89 percent since the start of the epidemic (2019). In 2021, the average rate of digital transformation was 53.89 percent, a 9.39 percent increase from 2020. The modus is currently at 80%; in 2021, there were two levels of

50% and 60%; prior to the pandemic of 2019, it was at 40%. The mean has also increased by 20% since the beginning of the pandemic. Prior to a global epidemic, the percentage was 44%; in 2021, it rose to 55%; and it is currently at 64%. Table 2 gives an overview of the chosen Digital Value proposition metrics.

**Table 2.** Provides the range, the mean, and typical digitization rates within the significance proposition block (authors' creation, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021-2019)</b>	<b>Now (2022)</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019-2022)</b>
Mode	40%	50%,60%	X	80%	X	X
Median	44%	55%	11%	64%	9%	20%
The average rate of digital trans formation	47.39%	53.89%	6.5%	63.28%	9.39%	15.89%

The value proposition has been updated to reflect modern times. Companies cite a shift in product pricing and customization as a significant change. Additionally, online product catalogues have been developed for consumers to peruse. Some businesses assert that digital transformation in this region is not yet at the level they desire. Consequently, additional developments in the extent of digitization of the Value Proposition are anticipated.

## Channels

The networks have collected extremely intriguing statistics. This block has been digitally changed for 72.2% of MSPs in the past year, while 27.8% of MSPs say they have not. Since 2019, when the pandemic began, the rate of digital transformation for the Channels block has increased to 66,61 %. This represents a cumulative growth of 29.78%. Interestingly, if we examine the period 2021–2022, the rate of digital transformation here has decreased by 5.11 percent. In 2021, the rate of digital transformation was 71.72 percent, a 34.89 percent increase from 2019.

(prior to the outbreak of the pandemic). Businesses attribute the present decrease in the pace of digitization to their return to in-person sales after relaxing limitations. The median also decreased, falling by 7% from 2021 to 2022, to 68%. Prior to the pandemic, it was 40%, but since the pandemic began, it has increased to 28%. The current modus is 65%, which also indicates a decline in ratio values. Table 3 offers an overview of a selection of relevant indicators.

**Table 3.** Provides a summary of the setting, the mean, and normal digital change speeds for the Channels section (source: authors, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021-2019)</b>	<b>Now (2022 )</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019- 2022)</b>
Mode	15%	75%,80%, 90%	X	65%	X	X
Median	40%	75%	35%	68%	-7%	28%
The average rate of digital transformation	36.83%	71.72%	34.89%	66.61 %	-5.11%	29.78%

The decrease in Channels' electronic usage rate over the past year is easily explicable. Due to the relaxation of pandemic precautions, they have resumed face-to-face communication. This is applicable to both supplier and consumer interactions. Consumers have an array of channels of distribution inside the established procurement structures, and a lot of them use face-to-face purchasing. Therefore, businesses have reacted to the limits of some channels of distribution, which were underutilized due to their lack of employ.

## Customerrelationships

In the past year, technological change has affected 77.8% of businesses, while 22.2% were not impacted. because the beginning of the epidemic, the Customer Relationships block's digitization rate for SMEs has increased by 37.5%, to 79.44%. This has risen by 15.2% since 2021. The method is currently at the exact same amount as in 2021, which is 90%. Prior to the pandemic, the standard of care was sixty percent. Since the onset of the pandemic, the mean has risen by 35% to reach eighty percent. Prior to the pandemic, the rate was at 45%. Table 4 provides an overview of the chosen a synopsis signs.

**Table4.** Provides a summary of the setting, the mean, and typical digital change rates in the client relationship block (source: authors, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021-2019)</b>	<b>Now(2022)</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019-2022)</b>
Mode	60%	90%	X	90%	X	X
Median	45%	70%	25%	80%	10%	35%
The average rate of digital transformation	41.94%	64.24%	22.3%	79.44%	15.2%	37.5%

Small and medium-sized manufacturing businesses (SMEs) have reported that their customer interactions have developed quite fast in the internet environment over the course of the last year. More and more businesses are making use of the many online communication platforms available to them, such as social networks, websites, and online shopping. Even if face-to-face interactions with customers are still extremely vital, the internet world is taking on an increasingly significant role in the process of communicating with customers and preserving those connections. In addition, because of their skillful use of social media targeting, they are able to bring in brand new clients.

## Revenuestreams

Sixty-one percent of small and medium-sized enterprises (SMEs) believe that digital transformation has either had no impact on income streams or has had a minor impact. The average rate of digital transformation for a company's revenue streams has already reached 66.78% for SMEs. Since the beginning of the epidemic, this block has therefore witnessed a growth that is equivalent to 21.67%. The pace of digital transformation was 61.17% in the year 2021, and it has only grown by 5.61% for the year 2022. The norm will remain the same for the years 2021 and 2022, which is 75%. In 2019, before the pandemic, it had reached a level of fifty percent. Since the beginning of the epidemic, there has been a 26.5% rise in the median value. Prior to the epidemic, the median was 48.5%, but after the pandemic it rose to 60%, and it is presently at 75%. The following table, which summarizes selected indicators found inside the Revenue streams block, is shown below.

**Table 5.** Provides a summary of the setting, the median, as well as standard deviations of digital change in the Revenue streams block (source: authors, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021- 2019)</b>	<b>Now (2022)</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019-2022)</b>
Mode	50%	75%	X	75%	X	X
Median	48.5%	60%	11.5%	75%	15%	26.5%
The average rate of digital transformation	45.11%	61.17%	16.06%	66.78%	5.61%	21.67%

The introduction of online payment platforms has been the most significant development over the course of the last year. E-commerce platforms that were only recently established have quickly become one of the most important revenue generators for businesses. E-shops that were once conceived as experimental pilot programs are now fully operational e-shops. In this section, businesses have indicated that they have ongoing plans to grow their online platforms in order to make this region as digital as is humanly feasible.

## Keyresources

According to data provided by 77.8 percent of businesses, the digital transformation did not have a significant impact on key resources during the last year. Only 22.2% of respondents believe that this area has seen development due to digital transformation. Despite this, there has been an overall rise in the amount of digital transformation. It is now at 62.11%, representing a gain of 18.61% for the whole. On the other hand, the pace of digital transformation has only witnessed a 4.33 percent growth over the course of the last year. The modus administrant is presently set at 60%. Prior to the pandemic, it had reached 30 percent. The modus had two levels of 60% and 80% during the pandemic that occurred in the year 2021. It's fascinating to look at the median value. Prior to the pandemic, it had reached 40%. During the pandemic of 2021, it reached a level of 60%. At this time, this figure represents the median. An overview of the chosen metrics for the digitally transformed area in this area is shown in Table 6, which may be seen below.

**Table6.** Provides a summary of the mode, the mean, and normal digital change rates for the primary information block (source: authors, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021-2019)</b>	<b>Now(20 22)</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019-2022)</b>
Mode	30%	60%,80%	X	60%	X	X
Median	40%	60%	20%	60%	0%	20%
The average rate of digital transformation	43.5%	57.78%	14.28%	62.11%	4.33%	18.61%

There is no indication that the corporations have major influence. The majority of the time, they will say that they foresee online commerce being an important source in the not-too-distant future. They also state that they are developing online scheduling solutions for workers so that they may better arrange their shifts in the industrial environment. In spite of this, however, this sector is not undergoing any digital change at the moment.

## Principal actions

The degree of digital change has been influenced in the last year, as reported by 66.7% of small and medium-sized enterprises (SMEs), while 33.3% of firms have not been affected. The average rate of digital transformation for important operations carried out by SMEs is presently 79.61%. In the year 2019 before the epidemic, this figure stood at 43.78%. This rate has increased to 75.39% in 2021, which is a growth of 31.61%. Therefore, this rate was 4.22 percentage points higher in 2022 compared to 2021. The modus has reached 90% at this point. In 2021, during the epidemic, the figure was 80%, but before the outbreak it was just 40%. Since the beginning of the epidemic, there has been an overall rise of 45 percentage points in the median. It was at 40% before the pandemic began, and it was at 80% in 2021. Currently, it is at 85%. As a result, it reached a level that was 5% higher between the years 2021 and 2022. The following table, which contains chosen ratios for the given time period, may be found below.

**Table 7.** Provides a summary of the mode, median, and standard digital shift rates for the primary tasks block (source: authors, 2022).

	<b>2019 (before pandemic)</b>	<b>2021 (during pandemic)</b>	<b>The increase (2021-2019)</b>	<b>Now(2022)</b>	<b>The increase (2022-2021)</b>	<b>Total increase (2019-2022)</b>
Mode	40%	80%	X	90%	X	X
Median	40%	80%	40%	85%	5%	45%
The average rate of digital transformation	43.78%	75.39%	31.61%	79.61%	4.22%	35.83%

The establishment of brand-new online stores has also had an effect on the degree of digital change that has taken place in this area. E-commerce is quickly becoming one of the primary important activities that bring in the most revenue for businesses. As a direct consequence of this, a number of businesses have been able to successfully transition their operations from the strictly B2B market to the B2C markets. In addition, the development of industrial automation is a fundamental aspect of the operations of several businesses. Companies have made investments in new manufacturing equipment as well as information technology. This modification has led to more productive workers who, as a consequence of improved production procedures, are able to process a greater quantity of items.

## Strategic alliances

This block had an effect on fifty percent of the enterprises. Since the beginning of the epidemic, significant partnerships have seen a surge of 22.05% in the average pace of digital transformation. The current percentage is 60.44 percent. The value of this variable was 38.39% before to the epidemic. The percentage now stands at 53.5%, representing a 15.11% rise from 2021. The modus presently accepts inputs of fifty percent and seventy-five percent of the total. The modus has three values in 2019, which were 20%, fifty percent, and sixty percent respectively. In the year 2021, there was just one figure for the modus, and it was fifty percent. The median value inside this block reached a level of 62% after a 28.5% rise in value. Its value was 33.5% before to the pandemic, but by 2021, it had increased to 52.5%, representing a 19% rise from its previous level. The following table provides a summary of several chosen ratios.



**Table8.** Provides a summary of the setting, the mean, and normal digitization rates for the Important alliances block (source: authors, 2022).

	2019 (before pandemic)	2021 (during pandemic)	The increase (2021-2019)	Now (2022)	The increase (2022-2021)	Total increase (2019-2022)
Mode	20%,50%,60%	50%	X	50%,75%	X	X
Median	33.5%	52.5%	19%	62%	9.5%	28.5%
The average rate of digital transformation	38.39%	53.5%	15.11%	60.44%	6.94%	22.05%

The primary shift in the commercial alliances that have taken place is the collaboration with PR firms, who are responsible for the internet communication of the company. Some businesses have also developed inventory delivery systems in order to make the acquisition of materials as effective as it can possibly be. This is something that the external information technology corporations who were responsible for creating these systems assist them with.

### Structure of costs

Over the course of the most recent time period, there was a little rising trend in the cost structure of digital transformation. The majority of small and medium-sized enterprises (SMEs) believe that this sector is still undergoing digital transformation. Only 22.2% of SMEs believe that to be the case. Since the beginning of the epidemic, there has been a rise of 8.33%, bringing the average digital transmission rate up to 68.5%. This block's degree of digital transformation started off at 40.56% when the epidemic began, but by 2021, it will have climbed to a value of 60.17%, representing a 19.61% increase from its starting point. This results in a total rise of 27.94% since the start of the epidemic. Before the pandemic, the modus was set at 40%; by the year 2021, it had risen to 80%; and at the moment, it can take on either 75% or 85%. Since the beginning of the epidemic, there has been an overall rise of 31% in the median. Prior to the pandemic, it stood at a value of 42.5%, and by 2021, it had risen to a value of 60%; now, it is at 73.5%. A rundown of various ratios is shown in Table 9, which may be found here.

According to the reports of the companies, the debut of new equipment and processes has culminated in a considerable reduction in the costs of the products. The costs have been transferred to the external businesses that are responsible for managing the systems on their behalf. Nevertheless, digital transformation has resulted in cost savings for the vast majority of businesses. They are seeing positive results from their investment in manufacturing automation, and most of them anticipate a very rapid return on their money.

**Table9.** Provides a summary of the setting, the mean, and typical digitization rates in the costs block (source: created by authors, 2022).

	2019 (before pandemic)	2021 (during pandemic)	The increase (2021-2019)	Now (2022)	The increase (2022-2021)	Total increase (2019-2022)
Mode	40%	80%	X	75%,85%	X	X
Median	42.5%	60%	17.5%	73.5%	13.5%	31%
The average rate of digital transformation	40.56%	60.17%	19.61%	68.5%	8.33%	27.94%

## Various construction elements' significance for manufacturing SME

At the conclusion of the study, we posed the question to the companies as to whether or not they were now able to rank the significance of each component of the building block. On a scale from 1 to 5, the ratings were determined, with 1 indicating the least amount of relevance and 5 indicating the most amount of significance. When compared to the values achieved in 2021, these values were found to be significantly different. It is also fascinating to watch how the significance of some of the blocks has grown for the firms since they were first introduced. The relevance levels of each constituent building component are summarized in Table 10, which may be found below.

**Table 10.** Overall importance scores for distinct constructing units (source: authors, 2022).

	The Mean Importance for 2021	The Mean Importance for 2022	The Distinction
Consumer categories	4.30	4.72	+0.42
Value propositions	3.00	3.05	+0.05
Channels	2.78	2.33	-0.45
Client connections	4.06	4.44	+0.38
Revenue sources	3.33	3.67	+0.34
Important sources	3.06	3.22	+0.16
Principal actions	3.28	3.67	+0.39
Critical relationships	3.28	3.67	+0.39
Structure of costs	3.44	3.83	+0.39
The overall mean	3.39	3.62	0.23

As can be seen in Table 10, the relevance of each constituent building block has evolved throughout the course of the last year. The Customer sector remains the most important for businesses, as seen by its significance level of 4.72, which represents an increase of 0.42 from its previous value. This demonstrates that clients are very vital to the success of a company in terms of creating revenues, and that without effective segmentation, a company would be unable to operate at its full potential. The Channels block, on the other hand, maintains its position as having the least significant impact. Even more surprising was the 0.45-point drop that was noted. Because of the restrictions caused by the epidemic, distribution methods were of the utmost importance during the pandemic. Channels have thus lost part of their importance to businesses as a result of the relaxation of the restrictions, which has resulted in firms resorting to direct face-to-face meetings and discussions. But with the exception of Channels, the total amount of all construction pieces has grown. What I find particularly fascinating is the importance given to Key Partnerships and Key Activities. In the year 2021, both of their values were equal to 3.28. Even today, they both have values of 3.67, which is an increase of 0.39 from before.

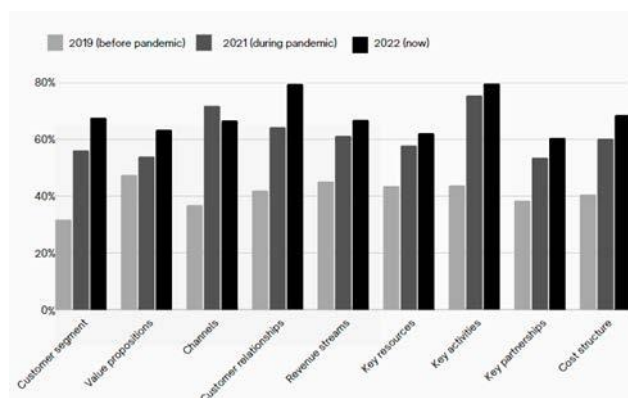
### An overview of the findings

The percentage of digitization for SMEs is a median of 68.3 percent. Since the start of the epidemic in 2019, this represents an increase of 27.3% overall. The rate of digital transformation was found to be 61.6% on average in 2021, representing a growth of 6.7% in comparison to the previous year. The downward trend has already fallen dramatically, despite the fact that enterprises are moving toward digitalization. The following figure, Figure 1, illustrates the typical pace of digital transformation for SMEs in the production sector.



**Figure1.** *The median rate of digital change of small and medium-sized enterprises (SMEs) in the industrial sector (source: made by writers, 2022).*

The accompanying figure, Figure 2, shows the average pace of digital transformation for each BM Canvas building component for the years 2019, 2021, and 2022. At this time, the Key Activities block has the highest percentage of digital content, which is 79.61%. The rate of digital transformation in customer service is likewise rather high, coming in at 79.44%. The Key Partners in Business block has the lowest level of digitization, coming in at 60.44 percent.



**Figure2.** *The mean pace of digitization for every BM Canvas architectural component for the years 2019, 2021, and 2022 (source: created by authors, 2022).*

## Discussion

The researchers Christofi et al. (2023) examined emerging digital innovations in SMEs in conjunction with the issues that were presented by the pandemic. The researchers contend that the epidemic has compelled businesses to develop new ways to conduct their operations as a direct result. This is supported by the findings of our study, which demonstrates a discernible shift toward digital transformation in small and medium-sized enterprises (SMEs) for the Canvas company model following the outbreak of the pandemic. The authors of Christofi et al. (2023) contend that these shifts have a favorable influence on the ability of businesses to continue to develop new business models. In addition, Malodia et al. (2023) discover a substantial connection among digitization and the success of firms. In accordance with Rupeika-Apoga et al. (2022), digital transformation has a beneficial mediation impact owing to the digital direction on income and company structure as well as the digital capacity on revenue. This is one of the reasons why digital transformation has a beneficial effect."

According to the findings of our study as well as those of other writers, it is possible to draw the conclusion that the pandemic has sped up the process of digital transformation. The improved performance of SMEs is another area that benefits from digital transformation's favorable effects. These insights may be helpful for managers of SMEs and practitioners of related fields. Small and medium-sized businesses stand to profit from being committed to

digital technologies. In addition, the study that we have conducted has concentrated on analyzing how the rates of digital transformation have changed at BM Canvas ever since the epidemic first started. The discovery that certain blocks have undergone particularly rapid digital transformation as a result of the epidemic comes as a surprise. Consider the "channels" block, for instance. Nevertheless, in 2022, when the global epidemic countermeasures were not as stringent as they were in 2022, this block observed a reduction in the pace at which digital transformations occurred. This is why businesses began to emphasize the importance of face-to-face interaction once again. Despite this, the majority of the blocks are still undergoing digital transformation, and it will be fascinating to follow the development of this trend in the studies.

## Conclusions

Throughout the start of the epidemic, the researchers have been observing the progression of digitization affecting enterprises that are small and medium in size that are involved in manufacturing. On the basis of a questionnaire and semi-structured interviews conducted with executives from SMEs, major shifts in a number of features of BM models were brought to light. Before the pandemic, businesses had a digital shift pace of approximately 41 percent for every BM Canvas structure on median. The Value proposition had the greatest percentage, at 47.39% of the total. On the other hand, the Customer category recorded the lowest percentage, which was 31.7%. Following the global pandemic breakout, an increase in the median rate of digital change was seen across all of the building blocks. Despite this, the growth was not uniform across the board. Because businesses did not believe it necessary to use digital technologies, the pandemic caused less damage to some building blocks than was caused by COVID-19. By the year 2021, the global average pace of technological change had increased to 61.6 percent. The median rate of digitization for channels increased at the fastest pace, which was 34.89%. The pace of median digital change, nevertheless, slowed down in 2022, reaching a value of 68.3% despite having previously been at a higher rate. Even while most of the constituent parts had growth, it was not quite as large as it was in 2021. Even more surprising is the fact that the Channels block had a 5.11% drop in the median digitization rate, bringing it down to a score of 66.61%. The businesses offered an explanation for this phenomenon, stating that when some restrictions were eased, it was no longer necessary to utilize certain channels. Throughout the course of the pandemic, businesses saw a shift in the relevance of the many components that make up a product. On a scale from 1 to 5, wherein the number one showed the least important while number 5 highlighted, in contrast, the most important, businesses started placing a greater emphasis on the Customer sector, which has now increased to a value of 4.72 after having previously been at a value of 4.60. Customer connections, which have a value of 4.44, are a block that is considered to be of comparable significance for businesses. This suggests that businesses have started to understand the worth of the client even more as a result of the pandemic measures that have reduced the amount of shopping that has been done. According to the opinions of the corporations, the Channels block is now the one with the least amount of relevance since its worth has recently declined.

To summarize, the progression of digital transformation looks different depending on which building pieces of the BM Canvas are considered. Since July 2022, there has been a slowdown in the overall pace of the digital shift being implemented throughout the Channels block. The growth of the other blocks has been seen, and they will continue to expand. Nevertheless, the gains are not as significant as they were in 2021. For future study, an appropriate research issue would be to investigate whether or not the digitization will keep on growing for particular blocks in future times.

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