Changes and Adaptations of Business Models Caused by the Crisis Scenario

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Abstract: Due to the fast-changing environment caused by the impact of the pandemic, a response to companies’ behavior is inevitable. These pandemic crisis scenario triggers searching for changes, adjustment, and adaptation of business models to seek new opportunities for competitive advantage. Therefore, the paper aims to analyze, identify and evaluate the impact of a pandemic on a firm’s business model, specifically to changes in its business elements. The research methodology applies a statistical apparatus mainly the Mann-Whitney U test, using the econometric software EViews for identifying the significance of individual business model elements within national economy sectors and branches before the pandemic and the current post-pandemic crisis. Data were obtained from 173 Czech and Slovak companies’ owners (executives). The findings represent the perception and view of businesses on the current post-pandemic crisis and their priorities changes in specific elements of business model.

1. INTRODUCTION

The phenomenon of application of business models (BM) has grown steadily over the last decade, with changing global, market conditions having a major impact on the change and orientation of companies in the use of technology, easier availability, high mobility, pressure, and variable customer preferences. Furthermore, the current global post-pandemic crisis is a source for the necessary conversion in approaches to how to manage, develop, strengthen and compete with these new challenges. Therefore, the paper aims to analyze, identify and evaluate the impact of a pandemic on a firm’s business model, specifically to changes in its business elements.

Business modeling and BM design provide an operationalized visualized tool for understanding the operations of a particular company. There are approaches to how to proceed to create a business model (see, for example, Osterwalder and Pigner, 2010; Wirtz 2011; Gassmann, Frankenberger, Csik, 2014). They all provide a process approach for constructing the general form of the BM. In a similar vein, based on a comparison of these three approaches (see for, Steinhöfel and Kohl, 2016), the authors used the Business Model Canvas (BMC) procedure by Oстерwalder and Pigneur (2010), which allows the construction of the BM into nine elements: value propositions, customer segments, channels, customer relationships, revenue streams, key partners, key activities, key resources, and cost structure. The applied framework is accepted because it not only allows the definition of the element, they also define the relationships between the elements (Chungyalpa et al., 2016).

Therefore, the authors intend to map the impact of a pandemic crisis influences in companies and identify significant changes in individual elements of the BM; the same framework was

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applied before (2019) and in the current post-pandemic situation (2021). This yielded data that can be compared with each other and draw the main consequences.

The paper is structured as follows: first, a literature review represents the issue of BM adaptation within the composition of individual BM elements. In this way, the context under the structure of the BM elements and the possibilities of approaches from the perspective of entrepreneurs/owners/managers due to the necessity of innovation, change, and adaptation, are introduced. Next, the following part of the paper is focused on a research methodological framework, including the research results. Then, the paper extends with a discussion part, the authors highlight the noted changes, reflect the results. Also, the authors ask questions for the clarification of the identified results in BM and point out the main trends and areas of the BM elements that are characterized by the main “cores” of change. Then, concluding remarks provide knowledge for the transfer of findings for entrepreneurs/managers/scholars who can follow up and further examine the impact of changes on the structure of BM.

2. BUSINESS MODEL ADAPTABILITY

The BM is defined in the literature in terms of the company’s value offer and market segments, the structure of the value chain needed to implement the value offer, the mechanism of obtaining the value that the company uses, and how these elements are interconnected (see, for example, Foss and Saebi, 2015; Morris et al., 2005; Teece, 2010; Wirtz et al., 2016). The BM essentially depicts an aggregated and simplified explanation of the company’s respective activities (Wirtz, et al. 2016). Intuitively, “a business model is a description of an organization and how that organization functions in achieving its goals (e.g., profitability, growth, social impact)” (Massa et al., 2017, p. 73). Therefore, we consider it as a suitable tool for an operationalized description of the company’s main activities. In this way, the phenomenon of the BM is accepted for practical and voguish reasons (Prescott and Filatotchev, 2021, p. 518) by entrepreneurs, managers, and scholars. And it is practitioners and managers who pay attention to BM as a phenomenon (Schwarz and Stensaker, 2016), which has a concrete practical application not only in the establishment of companies but also in their management, development, and competitiveness.

Wirtz et al. (2016) conduct a comprehensive study defining the BM of origin, development, and future research perspectives. We follow the idea that the BM has reached the global impact, which is strengthened by current post-pandemic developments. Furthermore, the adaptability of the BM is determined by the speed of implementation of changes in individual elements, in the structure of a particular business model. We adopt the basic logic, where it is necessary to operationalize the company’s activities (distribution into individual components), then manage these components, control performance, and initiate changes according to the firm’s results. These changes must be implemented by owners/entrepreneurs/managers, who can spread specific plans for change, innovation, and improvement of individual activities (visualized as elements of BM) and then develop them more into specific plans, responsibilities, and time frames.

Additionally, in the paper, we combine the area of BM structure (value creation, innovation, and components) and also the area of the business model management process (implementation of changes, realization, change, and development). It is not important to deal with the concept of the BM, it is taken over and theoretically already analyzed – see, for example, Casadesus-Masanell and Ricart (2010), Wirtz, 2011, Zott et al. (2011), and Baden-Fuller and Haefliger (2013). But on the contrary, it is important to highlight adaptability, which can be a source of
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A flexible structure and the dispersion of decision-making rights into specific parts of the business model can be levers to increase the company’s adaptability.

The authors understand adaptability as a company’s approach to consider, both external and internal conditions that shape the market environment in which the company exits and sells its products or services. The rate of adaptability is determined by the ability to create change, innovate, and implement it. The interaction between BM adaptation and the success of new ventures can be seen in a study by Balboni and Boroluzzi (2015). According to Adámek and Meixnerová (2020, p. 864), business success is given by the effectiveness of creating individual elements of the BM in their interconnection and the ability to transform inputs into outputs. Additionally, in connection with the BM, we see the potential where the adaptability of the BM is key to maintaining or improving competitive advantage depending on post-pandemic developments (as well as other global crises in the past). Contrary, some critics say that the shifts are sudden reactions to the pandemic, and once “normalcy” is restored, companies will return to their former business models or find a new one to settle. This may well happen, but the opportunity the pandemic has brought to digitize business or identify a viable alternative BM can be well exploited by companies searching to broaden their horizons (Seetharaman, 2020).

Overall, based on a theoretical definition, the paper deals with the identification of specific nine elements of the BMC that are subject to changes and adaptation in reaction to current post-pandemic developments. In response to the empirical gap, we attempt to understand what business model elements see the companies as the leading in adaptation and is the source of survivability, development, or even strengthening the competitive advantage. To do so, we assume that the identification of key elements of the BM will be positively reflected in the need for adaptation, and subsequently in the survivability, growth, and profitability.

3. DATA AND METHODS

We use data from a survey about the effects of the post-pandemic crisis and the influence of individual elements of the BM. Data were collected in 2019 and subsequently, the same mechanism was implemented in 2021, when the pandemic was already fully manifested and a crisis, the post-pandemic period was coming. The questionnaire was completed in cooperation with the owners/directors of the businesses in the form of a personal interview. The sample of respondents was selected selectively, there was feedback on the willingness to participate in the research. A total number of 173 businesses from the Czech and Slovak republic participated in the survey and provided their perspective. Data are processed using Microsoft Office Excel and econometric software EViews (see, for example, Bin Othman and Heng, 2014; Allbright, 2013).

The question of how to measure business models and their changes has not been answered in the BM literature (Saebi et al., 2016). This means that a validated measurement scale is still not available. Instead, as the Clause study (2016) shows, each dimension of the business model is commonly measured individually. Furthermore, nine elements of the BMC were used to specifically identify the significance. The businesses present different industries and we adapt the criterion of classification according to the specific national sector, namely two sectors, secondary and tertiary. The significance of the change in the main key element of the business model was researched, which is core for the necessary changes and rapid adaptation for the survivability of the company when the significance before and after within the current post-pandemic situation...
was compared. Given the nature and importance of the secondary and tertiary sectors for national economies, according to the national economy sector in the Czech Republic, the services sector has a dominant share in gross value added (62 %), the share of industry is 30 %. (Deloitte, 2020). Thereafter, a data and methods part is presented, and we aggregated two hypotheses.

**H1** *It is likely that firms representing the secondary sector in a post-pandemic crisis are adapting the most in the cost element than in other elements of the Canvas business model.* In this hypothesis, we assume that companies in this sector are characterized by high fixed costs and general production costs are essential inputs, and therefore will seek immediate adaptation to the situation (e.g. disproportionate increase in raw material and energy costs, etc.)

**H2** *It is probable that companies in the tertiary sector in a post-pandemic crisis adapt most to the element of channels than to other elements of the Canvas business model.* We assume that companies providing services will make the necessary changes in the availability of their services and forms of communication to customers, such as higher levels of digitization and bringing the company’s activities closer to target segments.

To verify hypotheses a descriptive analysis approach was employed for data analysis (Shafi et al., 2020). The nature and scope of business models are distributed normally, and despite immediate government restrictions on business activities during the period under review, they have tilted the distribution towards non-normal distribution. Assumption of normality, Table 1, confirms the Moivre – Laplace Theorem (Allbright, 2013), and therefore the authors of the paper use the nonparametric Mann-Whitney U test (Bin Othman & Heng, 2014), Table 2. Before using the Mann-Whitney U test, the normal distribution was verified using the Shapiro-Wilk normality test, Table 1. A simple random sample was taken from Table 2 and checked in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Assumption of normality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Businesses</td>
</tr>
<tr>
<td>Industry</td>
</tr>
</tbody>
</table>

**Source:** own processing in EViews

### 4. ANALYSIS AND RESULTS

Table 2 summarizes the results of the dependence of each element of BM when compared to two periods (before the pandemic and current post-pandemic crisis). To measure the significance of each BM element, we asked respondents to indicate on a 5-point Likert scale (1-minimum significance, 5 maximum significance). The businesses that have more than one subject of activity were divided evenly into industries. Surveyed businesses (Table 2) are classified according to the Classification of Economic Activities according to NACE (Czech Statistical Office, 2021), which is internationally recognized as NACE (Statistical Classification of Economic Activities in the European Community); it classifies enterprises into sectors in terms of national economy: primary sector (raw materials), secondary sector (production and industry), tertiary sector (services sector), and quaternary sector (services sector). Table 2 shows for each of the addressed businesses identified elements of BM that need to be changed to improve their competitive position in the market.

In the secondary sector, a significant dependence and importance on the BM factor “revenue streams” was identified. As a result, businesses in the industry primarily address possible options in which they can generate their revenue, how they can multiply it. Here, the possibilities
of additional capital lending, the transition from property ownership to leases, and shared principles prevail. Also, firms responded to a certain creation of cash reserves, for example by selling assets. On the other hand, companies are looking for ways to earn new ways of earning (for example, licensed sales, payments for use, and brokerage). The second important element was the “customer segment”, where firms predominate in B2B, so the criterion for survival, maintaining the company’s activities are actively involved in identifying key customer segments and maintaining them. In this way, firms are active in the possibilities of finding new segments (for their constant offered values). It is therefore surprising that companies are not willing to change their internal processes or make offers but are seeking revenue opportunities and new segments/markets, or they want to retain existing customers.

Table 2. Significance of the business model elements according to sector and industry

<table>
<thead>
<tr>
<th>National economy sector</th>
<th>Branch</th>
<th>Representation [%]</th>
<th>Customer segments</th>
<th>Value proposition</th>
<th>Channels</th>
<th>Customer relationships</th>
<th>Key activities</th>
<th>Key partners</th>
<th>Cost structure</th>
<th>Revenue streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td>Travel / Transportation</td>
<td>37</td>
<td>0.041</td>
<td>0.067</td>
<td>0.130</td>
<td>0.062</td>
<td>0.052</td>
<td>0.052</td>
<td>0.067</td>
<td>0.057</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Financial</td>
<td>5</td>
<td>0.016</td>
<td>0.016</td>
<td>0.010</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.016</td>
</tr>
<tr>
<td>Secondary</td>
<td>Industry</td>
<td>18</td>
<td>0.047</td>
<td>0.052</td>
<td>0.052</td>
<td>0.067</td>
<td>0.052</td>
<td>0.073</td>
<td>0.088</td>
<td>0.036</td>
</tr>
<tr>
<td>Quaternary</td>
<td>Technological</td>
<td>6</td>
<td>0.016</td>
<td>0.021</td>
<td>0.031</td>
<td>0.031</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.016</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Tourist/ Accommodation</td>
<td>8</td>
<td>0.031</td>
<td>0.021</td>
<td>0.041</td>
<td>0.031</td>
<td>0.021</td>
<td>0.026</td>
<td>0.036</td>
<td>0.041</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Other</td>
<td>16</td>
<td>0.041</td>
<td>0.057</td>
<td>0.052</td>
<td>0.047</td>
<td>0.021</td>
<td>0.031</td>
<td>0.031</td>
<td>0.026</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Educational</td>
<td>4</td>
<td>0.016</td>
<td>0.016</td>
<td>0.021</td>
<td>0.005</td>
<td>0.005</td>
<td>0.010</td>
<td>0.010</td>
<td>0.010</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Entertainment</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.005</td>
<td>0.005</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Medical</td>
<td>2</td>
<td>0</td>
<td>0.005</td>
<td>0.010</td>
<td>0.005</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.005</td>
</tr>
<tr>
<td>Primary</td>
<td>Agriculture</td>
<td>3</td>
<td>0</td>
<td>0.005</td>
<td>0.005</td>
<td>0.016</td>
<td>0</td>
<td>0</td>
<td>0.016</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Source: own processing in EViews, significance level 5 %

Therefore, we can state that H1 is not supported. The businesses represented secondary sector in a post-pandemic crisis are not adapting the cost element but they adapted activities in BM element “revenue streams” and “customer segments”.

In the primary sector, we encounter a mix of findings where individual branches have different results. Overall, the crucial importance of the BM element is found in “customer segment”, “customer relationship”, and “key activities”. There is an evident focus on the customers and their needs, which means that businesses are willing to get as close as possible, use appropriate targeting, use technology, and digitization of pro-customer processes. The activities of firms
move to solve the customer’s problem by matching the offered value. The concentration on key activities of companies is due to higher demands on the services provided; these activities are performed by resources (but these are not the main interest). Simplification and streamlining of activities and internal processes are important for companies, they have the potential for some cost savings and especially the re-adjustment of activities in the future (see below the horizon). These activities are again associated with higher involvement of information technology in internal activities (automated systems, processes, etc.) The meaning of “channels” appears only at the financial branch, there is importance in the availability of services to customers (online access, online administration, communication, document processing, etc.); all this has accelerated digitization in the banking and financial sector. “Value proposition” (tourist/accommodation) was identified in other positions. Here it is evident that many companies from this branch have focused on changing the offered value as a whole. For example, they are abandoning the original offered value to new ones (e.g. combined and additional services, offer corrections, new freemium models). It is a matter of companies seeking to reach customers despite the negative restrictions and limitations surrounding them and looking for ways to change the values offered.

In this regard, H2 is not supported. The businesses that represented the tertiary sector in a post-pandemic crisis adapted mostly BM elements “customer segments”, “customer relationship”, and “key activities”.

5. DISCUSSION

The results may stir up a debate about which BM element is the best suited for adaptation in the current post-pandemic situation. It is not possible to say unequivocally what is the most appropriate. Thus, it is appropriate to review the overall BM (which, however, does not confirm the results of the research), and accordingly take further process steps based on the company’s capabilities, consider external influences and overall business’s potential. Therefore, businesses can make decisions under conditions that they either perceive as an opportunity or a threat. Hence, the current post-pandemic situation contributes to a reactive perception, where companies reduce threats rather than see opportunities; this has been confirmed in the secondary sector. Also, there is a discussion concerning the differences in long-term or short-term impact. The question is whether short-term measures on the revenue streams side are the proper solutions. From a long-term perspective, it is appropriate to combine with elements of the offered value, which is a fundamental way the business can open new perspectives. But there are some limitations in the conservative approach, which are characterized by a strong industrial history and a certain inflexibility. On the other hand, the businesses are aware of the importance of their customers (due to the predominance of the industry sector and B2B markets), when they expect ways to be active in segments, how to diversify them, and adapt them to the specific value offered.

In contrast to these observations, the tertiary sector is characterized by a focus on the customer perspective, trying to find both new segments, maintain existing, but also seek new value, which can be a source of longer-term competitive advantage. There is a fundamental difference compared to the secondary industry where businesses are more flexible, have a greater effort to seek and implement new opportunities, such as investing in technologies and activities to simplify their internal processes, all for satisfied customers. These aspects are probably due to the high concentration of competition, where each advantage can be a source for a more significant competitive position. The high concentration of businesses causes a more competitive struggle, also due to the minimum barriers to entry.
In summary, it can be stated that the businesses in the secondary sector are adapting to the current post-pandemic crisis and most of them are more responsive to the threat than to do so for their development and market opportunities. In this regard, against the secondary sector is the tertiary sector, where the pro-customer perspective dominates with a willingness to change the value offered.

6. CONCLUSION

The paper contributes to the debate on how BM element influence relates to the externalities caused by the pandemic and the need to change and adapt to the BM changes in the businesses. Admittedly, these findings of the paper represent the perception and view of businesses on the current post-pandemic crisis and their priorities changes in specific elements of BM. For example, this will deliver businesses to respond appropriately to change and adapt more quickly to maintain their market position or, conversely, to take advantage of new opportunities.

In more detail, regarding the current state of the influence of individual elements of the BM, we found that the businesses that represented the secondary sector in the post-pandemic crisis are not adapting the “cost structure” element but they adapted activities in the BM element as “revenue streams” and “customer segments”. In contrast, the businesses represented the tertiary sector adapted mostly the BM elements as “customer segments”, “customer relationships”, and “key activities”.

Finally, the results confirmed the approach of businesses the effort that they want to react to the development in a certain direction, but these reactions are different. The approaches of businesses to individual BM elements are different in the observed sectors. Finally, it can be stated that companies have certain reserves in increasing the efficiency of internal processes, setting specific relationship mechanisms for generating the value offered. Thus, the transfer of research results to the participated businesses is a suitable way to support the binding and other options for entrepreneurs/owners/managers to consider a specific BM of their entities in a long-term perspective. This research aims to generalize the effects of the pandemic and the subsequent economic crisis in a common context, where the BM elements are a tool for the adaptability of the BM to preserve business activity.

7. FUTURE RESEARCH DIRECTIONS

The results of this research should be judged in light of its limitations. First, our research has limitations in the representation research sample, in the number of businesses, and also the uniformity of representation according to individual industries. Furthermore, we need to consider the problematic pandemic situation and the capacity of the research authors. Dependencies between individual elements of BM were also not investigated. The focus of further research will be on the significance and dependence between the individual elements of BM and also the expression of the effect of the whole complex change in BM. Additionally, dependencies between individual elements of BM were not researched.

ACKNOWLEDGMENT

REFERENCES


