Sanja Knežević
University of Slavonski Brod
35000 Slavonski Brod, Croatia
sanja.knezevic@unisb.hr

Hrvoje Sivrić
University of Slavonski Brod
35000 Slavonski Brod, Croatia
hsivric@unisb.hr

Danijel Kušljić
ImPPPact – Civil & Social Organization
35000 Slavonski Brod, Croatia
d.kusljic@impppact.org

JEL: D24
Preliminary communication
https://doi.org/10.51680/ev.35.1.13

Received: July 6, 2021
Revision received: December 6, 2021
Accepted for publishing: January 25, 2022

CRITICAL BUSINESS PROCESSES OF PROCESSING COMPANIES IN THE CONDITIONS OF THE CORONAVIRUS PANDEMIC

Abstract

Purpose: The aim of this research is to identify the most exposed business processes in the pandemic era and investigate how the COVID-19 pandemic affected these processes in the processing companies in Brod-Posavina County.

Methodology: The questionnaire was sent electronically to the official e-mail addresses of 49 processing companies in Brod-Posavina County according to the FINA register. The questionnaire was filled in by 102 respondents from 35 processing companies. The survey included employees of companies with more than 3 years of work experience in the considered company who are employed in management, commercial, financial or technical positions.
The study uses descriptive statistical analysis and multivariate factor analysis.

Results: The most exposed business processes were selected. Based on respondent's perceptions, research results confirm the exposure of all mentioned business processes to the coronavirus pandemic. "Work organization" and "commercial and financial area" are recognized as the most exposed business process and business area significantly exposed to the risk of unsustainability in Brod-Posavina County processing companies, respectively.

Conclusion: The research findings confirmed the hypotheses of the paper, which propose that the disruption caused by the coronavirus pandemic had an impact on all business processes in processing companies and there was a business area significantly exposed to the risk of unsustainability in the conditions of the coronavirus pandemic. The identified business process and business area may serve as a basis for comparison in similar future cases.

Keywords: Pandemic, economy, processing sector, risk of unsustainability

1. Introduction

"Coronavirus (COVID-19) is an infectious disease caused by a newly discovered coronavirus" (World Health Organization, 2021). COVID-19 has become an event that completely surprised the world, influencing a number of social and economic activities and the consequences of the coronavirus will be felt in both business and everyday life. "The first coronavirus case in Croatia was confirmed on 25 February 2020" (Government of the Republic of Croatia,

2020). "This is a crisis like no other and that there is considerable uncertainty about its impact on the lives and existence of people" (International Monetary Fund [IMF], 2020).

The global spread of the COVID-19 pandemic has caused numerous negative impacts on the business and market position of the entire economy of both Europe and Croatia. "Croatia's economy experienced a 15.1% GDP decline in the Q2 2020 as a result of the corona crisis" (Central Bureau of Statistics of the Republic of Croatia, 2020). "It is clear that coronavirus is causing economic changes, and numerous studies indicate that the COVID-19 pandemic is likely to generate growth losses for many economies and force millions into poverty unless effective and timely measures are taken" (Barua, 2020).

COVID-19 caused many industries to change the way they operate. "The COVID-19 crisis has, in the near future, required organizations to look for digital replacements or identify ways of delivering their products and service with minimal physical contact and safely" (Seetharaman, 2020). "The COVID-19 pandemic has forced many organizations to undergo significant transformation, rethinking key elements of their business processes and use of technology to maintain operations whilst adhering to a changing landscape of guidelines and new procedures" (Dwivedi et al., 2020). It has forced many companies to pause or reduce the manufacturing system and their operational activities for extended periods of time and seek sustainable solutions to ensure uninterrupted supply and business. Furthermore, the pandemic situation forces working with a reduced/limited workforce, which reduces manufacturing productivity.

"These dramatic declines in production are caused by a combination of several factors. First, lockdown and the effective closure of large sections of the economy have led to a drastically reduced demand, and a sharp decline in consumption of consumer durables" (Harris et al., 2020). Gajdzik and Wolniak (2020) believe that COVID-19 is a global problem for all industries and must be analyzed in different areas: economy, society, and enterprises.

Due to the characteristics of their business, processing companies are particularly sensitive. This pandemic impact on the processing industry caused many production processes to cease. Problems in the processing industry have led to reduced demand and disrupted supply chains. Disruptions in business processes are likely to cause difficulties in the activities of companies.

Although there are many studies related to COVID-19 and the manufacturing industry, there is a lack of analysis of processing companies in Croatia. To our knowledge, this is also the first study to investigate the impact of the coronavirus pandemic on business processes in Brod-Posavina County processing companies. The present study was conducted because Croatia has registered a high number of COVID-19 cases in EU (on 19 November 2021 – ranked fourth in Europe) (Statista, 2021). The most important economic activity of Brod-Posavina County is the processing industry, which generates 48% of the income of the county's economy, employs 50% of employees and accounts for 80% of total exports" (Croatian Chamber of Commerce, 2020, p. 74). Finally, the study also contributes to a better understanding of the exposure of all identified business processes in processing companies to the risk of unsustainability in the conditions of the coronavirus pandemic. In order to achieve our research goal, business processes that can be affected by the coronavirus pandemic are identified. This is followed by the recognition of the most exposed business process according to the risk of unsustainability. Consequently, business processes with similar exposures to the risk of unsustainability are grouped into appropriate business areas. This is followed by development of a business area that is significantly exposed to the risk of unsustainability. The paper ends with a conclusion and an outline for future research.

2. Literature review

The research topic of relevant empirical research papers related to the impact of COVID-19 on processing companies is extremely modest. Therefore, the intention is to unite foreign and domestic research papers which are related to the topic of the impact of COVID-19 on processing and manufacturing companies and economy in global.

According to Okechukwu et al. (2020), there is no literature available to manufacturing practitioners that identify the barriers and enablers of manufacturing resilience, especially with regards to pivoting the manufacturing sector in response to a pandemic.

Roška et al. (2021) analyze the effect of the COVID-19 pandemic on the Croatian economy observed through declining employment, the required recov-

ery years, and declining GDP. The article explains that the COVID-19 crisis has had and will have more significant consequences than the financial crisis of 2007-2008 and many entrepreneurs cannot survive without greater support from their governments.

Sataić (2020) examines the attitudes of Croatian micro, small and medium entrepreneurs towards the economic impact of COVID-19 during the lockdown period in Croatia and the importance of change management for the future of their business. The author identifies financial and other problems that entrepreneurs face during the epidemic (financial problems and reduction of orders, disrupted logistics, increased difficulty in financing and the inability to deliver existing orders).

Stojčić (2020) analyzes the impact of the COVID-19 pandemic on changes in export competitiveness of firms from the Croatian manufacturing industry. The results show that the effects of the pandemic in practically all sectors have led to a decline in revenues, capacity utilization and problems of financial nature with liquidity and relations with customers and suppliers.

Looy (2020) analyzes the way in which the COVID-19 pandemic can stimulate more radical business process improvements. The author proposes a BPM tree to outweigh incremental process improvements from more radical ones, in order for organizations to exploit good practices but also to better explore emerging opportunities.

Shafi et al. (2020) analyze the impact of COVID-19 on micro, small, and medium-sized enterprises operating in Pakistan. The authors indicate that most of the participating companies have been severely affected and they are facing several issues such as financial, supply chain disruption, a decrease in demand, a decline in sales and profit, among others. In addition, they propose different policy recommendations to mitigate the adverse effects of the pandemic on MSMEs.

Zhitao et al. (2020) mention the importance of global supply chains. Their study shows that the COVID-19 pandemic has resulted in unprecedented disruptions throughout all their stages with major turbulences in manufacturing, processing, transport, and logistics, as well as significant shifts in demand.

Mohammed et al. (2021) discuss the enterprise's non-viable manufacturing due to its poor external and internal resilience profiles. It is emphasized that if an enterprise fails to develop internal capabilities such as readiness and sensing, it could also fail to manage external resilience. A resilient supply chain requires a blend of internal and external resilience.

Peng et al. (2020) analyze the impact of the COVID-19 pandemic on firms in China. The article explains that many companies have maintained overall stability, while others have experienced a halt in their operations or faced closure. Almost all companies in the survey are willing to transform into online and remote office work. Most firms barely maintained production, facing a shortage of materials or lack of supply. Many companies have faced higher labor costs, which have forced them to consider reducing the number of employees, cutting wages, and postponing recruitment until the effects of the pandemic are over.

Rapaccini et al. (2020) present the results of a unique study of industrial firms in Northern Italy regarding the impact of the COVID-19 pandemic on their businesses. In their survey, the authors discuss impacts of disruption on company operations and the supply chain, for both goods production and delivery (production, material supply, and distribution) and product-related service delivery (travel restriction, interruptions in the spare parts supply chain, and discontinuities with the service).

This review of the existing literature reveals several features of the current level of knowledge about the effects of the COVID-19 pandemic on the business processes in companies although it is clear that research into the effects of the COVID-19 pandemic at the microeconomic level in Croatia is still in its infancy.

3. *Business processes in processing companies*

The impacts of the COVID-19 pandemic are far-reaching and they have affected all sectors. COVID-19 has forced many processing companies to make significant changes to their normal business processes. These changes in the market have highlighted the importance of adaptability and flexibility.

"The business system consists of related components (departments) that work together to transform input (raw materials) into output (finished products) and its goal is to make a profit" (Varga & Strugar, 2016). One of the basic activities of every business system is the execution of business processes. "A business process is a series of logically

connected activities in which an organization's resources participate to satisfy customer's needs for products or services and create value for the company" (Davenport, 1993). As part of company organization, different business processes can be formed depending on the specifics and requirements of each company. "The economic efficiency of a company is based on the optimization of key processes that are internalized and optimized with regard to the range of activities and organization of the process and the separation and contracting of those processes in which the company does not have adequate competitiveness or significant strategic interest" (Kaštelan, 2005).

The COVID-19 pandemic disrupted global production and the supply chain system as well as most transportation links and distribution mechanisms between suppliers, manufacturing facilities and customers. "Currently, most of the manufacturing and supply chain organizations are struggling to anticipate the negative consequences of COVID-19. Most of the global markets are shrinking, and industrial managers are searching for new materials and process methods to maintain production" (Cohen, 2020).

"The present COVID-19 outbreak affects the global and national production systems and trade on a larger scale. The supply chain network showed poor resilience to this pandemic, and nearly 35% of the manufacturers reported their supply chain network failure due to the global coronavirus pandemic" (Kumara et al., 2020).

"Many organizations have been forced to adopt new ways of remote working using new digital systems for communication and to completely rethink their business models to adapt to the realities of the COVID-19 environment" (Carroll, 2020).

According to the above, business processes that are assumed to be most exposed to the effects of the coronavirus pandemic are as follows: product sales management (PSM), adjustment to regulatory restrictions (ARR), resource procurement management (RPM), product delivery organization (PDO), cost optimization (CO), cash flow management (CFM), work organization (WO), optimizing business communication (OBC), product promotion organization (PPO), and machine park maintenance organization (MPMO).

PSM is an essential business process in processing companies because there is a strong connection between sales promotion and organizational performance (Tandoh & Sarpong, 2015). Sales promotion increases profit in the organization as well as shareholder returns. Since efficient product sales are essential for competitive businesses, they should be fully implemented during a pandemic.

ARR implies the adjustment of all aspects of business to the new regulations adopted in the conditions of the COVID-19 pandemic due to the expected difficult regulatory conditions in the market. Regulatory restrictions in varying degrees affect the implementation of the company's business activities.

RPM implies the timely provision of sufficient quantities of all necessary resources for the production of products due to expected disruptions in supply chains and reduced availability of raw materials from suppliers due to crisis conditions. "As a limited definition of supply, procurement is today a strategic factor in a company's profitability and increasing shareholder value, and the importance of procurement for the company stems from its two sources, namely cost and operational efficiency" (Krpan et al., 2015).

PDO implies timely delivery of products to the end customer due to expected disruptions in the transport of products to the customer due to crisis conditions. Furthermore, according to Mikić (2009), medium-sized processing companies are paying more and more attention to modern cost management models and combining different models in order to increase their business efficiency.

CO means reducing all business costs of the company due to the expected disproportion between revenues and costs due to the pandemic. According to Akeem (2017), cost control and cost reduction techniques are considered very important for the growth and survival of any organization in a highly competitive environment, effective cost management is essential to a competitive business and cost optimization in all business segments should be fully implemented during the pandemic.

CFM is extremely important for business efficiency, and understanding the relationship between business occurrence and cash inflow/outflow is extremely important for financial business planning and, for this reason, it is essential to implement quality cash management during a pandemic. "A company with proper cash flow management can increase its financial results, while improper management can lead to financial failure" (Rahman & Sharma, 2020).

WO includes sustainable working conditions and working methods of employees in the company due to the expected difficult working conditions due to the pandemic, which make it impossible to work according to the usual working patterns of employees.

"Included employees boost organizational and individual performance. Improving employee involvement strategies is key to an organization's profitability" (Osbourne & Hammoud, 2017).

OBC implies sustainable ways of communication between employees within the company and with third parties outside the company due to the expected difficult conditions of human mobility and increased risk of coronavirus transmission by direct contact between people and during travel due to the pandemic. "Companies that understand that communication is an integral part of their strategic success will not only create a competitive advantage, but will also maintain it despite poor conditions" (Nwabueze & Mileski, 2018).

PPO implies sustainable communication with the market in order to inform consumers about the product and create consumer interest in buying products due to the expected difficult conditions of the usual promotion at fairs and exhibitions and other promotional channels due to the pandemic. "It has been empirically proven that innovative marketing conducted in the context of Industry 4.0 makes companies more competitive" (Ungerman et al., 2018).

MPMO implies the sustainability of repairs and service of machines and equipment used in the production process due to difficult servicing conditions and emergency repairs due to a pandemic. "Maintenance is crucial to the sustainability of many processing organizations because equipment maintenance status has a direct impact on production performance" (Muganyi & Mbohwa, 2017). Since the efficiency of the production process depends on the functionality of machinery and equipment, and failures of machinery and equipment cause delays in the production process leading to production inefficiencies, it is essential to have efficient maintenance of machinery and equipment during a pandemic.

4. Research methodology

Sample of respondents

The sample consists of 102 entities (89 male and 13 female) from 35 processing companies (71.42%) in Brod-Posavina County. Processing companies of Brod-Posavina County are analyzed, which belong to the categories of small, medium and large enterprises in the processing sector. Micro-companies and crafts are not taken into consideration. "The size of the companies on which the research is conducted is determined according to the criteria of the European Commission" (Recommendations of the European Commission, 2003).

A total of 64 respondents work in small, 18 in medium and 20 in large enterprises. All companies were operational during the pandemic. Respondents aged 31-40 account for the largest share of respondents (36.3%), followed by respondents aged 41-50 (22.5%), those aged 18-30 (18.6%) and there are only 2% of respondents aged 60 and over. Each respondent has 3 or more years of work experience in the company under study and is employed in a managerial, commercial, financial or technical position. The largest number of respondents (35.3%) holds the position of manager (leaders, supervisors), 28.4% the position of technical expert (calculations, design, engineering, supervision), 15.7% the position of officer (administration, commercial, secretariat), 9.8% the position of director (general, executive, operational, financial, technical), and 9.8% the position of financial expert (accounting, finance). Each respondent completed at least a professional study program, i.e. 42.2% of respondents completed a university graduate study/postgraduate specialist study program, 27.5% an undergraduate university study program, 24.5% a professional study program, and 5.9% a postgraduate master's study/postgraduate university doctoral study program. The average work experience of all respondents in the companies under study is 7.61 ± 3.98, while the average work experience of all respondents is 12.36 ± 6.29. Therefore, it is considered that each respondent has enough knowledge, experience and competencies to adequately understand the research issues.

Sample variables

The questionnaire contained 10 questions. It assessed business processes that are most exposed to the effects of the coronavirus pandemic. A clear explanation and instructions related to the research and its purpose were sent together with the link to the online survey. The survey was conducted from 1 January 2021 to 1 February 2021, and the observed period was from March 2020 to 1 February 2021. The survey was conducted voluntarily and a total of 102 responses were collected. The opinion of the respondents expressed in the questionnaire is a set of qualitative data for the collection of which the Likert scale was applied with an interval of 1 to 5 (1 - not exposed at all; 2 - partially exposed; 3 - moderately exposed; 4 - significantly exposed;

5 - fully exposed). Respondents were asked to circle the number that best described the level of business process exposure to the risk of unsustainability in the event of the COVID-19 pandemic for each business process.

Data processing methods

The data collected by the questionnaire were analyzed to test the following hypotheses:

H1: Disruption caused by the coronavirus pandemic had an impact on business processes.

H2: There is a business area that is significantly exposed to the risk of unsustainability in the conditions of the coronavirus pandemic.

Statistical analysis of results is performed (descriptive statistical analysis and multivariate factor analysis). Statistical data were analyzed by the STATISTICA statistical software package and the SPSS software package.

5. Results and discussion

Determining the exposure of individual business processes to the risk of unsustainability in the conditions of the coronavirus pandemic, the basic statistical parameters have been calculated using descriptive statistics and the results can be seen in Table 1.

Table 1 Descriptive indicators measuring variables (AS - arithmetic mean, SD - standard deviation, MIN -minimum value, MAX - maximum value, SKEW - asymmetry degree, KURT - curvature degree, STD.ERR - standard error)

	AS ± SD	Median	Mode	Min	Max	Skew	Kurt	Std. Err.
PSM	3.62 ± 0.87	3.50	3.00	2.00	5.00	0.19	-0.79	0.08
ARR	3.56 ± 0.87	4.00	3.00	1.00	5.00	-0.09	-0.21	0.09
RPM	3.63 ± 0.92	4.00	4.00	1.00	5.00	-0.35	-0.32	0.09
PDO	3.59 ± 0.99	4.00	4.00	1.00	5.00	-0.60	-0.02	0.10
CO	3.65 ± 0.85	4.00	4.00	1.00	5.00	-0.62	0.26	0.08
CFM	3.68 ± 0.89	4.00	4.00	1.00	5.00	-0.51	-0.01	0.09
WO	3.79 ± 0.81	4.00	4.00	2.00	5.00	-0.28	-0.35	0.08
OBC	3.64 ± 0.89	4.00	4.00	1.00	5.00	-0.34	-0.14	0.08
PPO	3.54 ± 0.93	4.00	4.00	1.00	5.00	-0.76	0.65	0.10
MPMO	3.12 ± 0.94	3.00	3.00	1.00	5.00	-0.46	-0.25	0.10

Source: Authors

It can be seen in Table 1 that the employees in processing companies in Brod-Posavina County consider "work organization" as a business process most exposed to the risk of unsustainability in the conditions of the coronavirus pandemic with exposure of 3.79 and statistical significance of 99%, which can be interpreted as a business process significantly exposed to the risk of unsustainability in the conditions of the coronavirus pandemic. Since the outbreak of the pandemic in Croatia, "the unemployment rate in February was 5.9%. The number of the unemployed in the next few months showed a growth trend, so the unemployment rate rose to 6.4% in March, 7.8% in April and 8.5% in May. In September, there was a slight decline when the rate was 8.0% and in December the rate was 7.5%" (Eurostat, 2021). Despite a slight decline, Croatia is one of the EU countries with the highest growth in the unemployment rate. It is obvious that in the conditions of increasing unemployment employees perceive the impact of the pandemic primarily through the organization of their work in the company in order to preserve jobs.

"The coronavirus pandemic has changed the way people communicate and how the economy works by encouraging people to reduce their direct, personal interaction with others." (Evans, 2020) This is one of the reasons why "work organization" is the

most exposed business process in terms of the risk of unsustainability in the conditions of a coronavirus pandemic. It also determines the perception of exposure of all business processes to the risk of unsustainability due to the effects of the coronavirus pandemic with a statistical significance of 99% ranging from 3.12 to 3.79, or in the interval from being moderately to significantly exposed to that risk. For the entire observed population with a statistical significance of 99%, it can be said that none of the considered business processes will have assigned exposure to the risk of unsustainability due to the coronavirus pandemic less than 3.12, which means that all considered business processes are at least moderately exposed to the risk of unsustainability due to the coronavirus pandemic. The overall mean 3.58 ± 0.18 shows that there are no significant deviations of all arithmetic means from the average, while the standard deviation from the arithmetic mean of the standard deviations is very small 0.90 ± 0.05, which shows that the differences in the opinions of the respondents are minimal.

The processing industry sector is particularly sensitive to the effects of the coronavirus pandemic. The processing industry is one of the most important sectors in the national economy and in Croatia it is the economic sector with the largest share in the structure of GDP and total employment and the largest share of total exports. According to CBS (2020), the total number of employees in Croatia in 2019 was 1,081,111, of whom 269,396 work in the processing industry. In 2019, the processing industry generated HRK 185.5 billion in total revenues and a share in GDP of 14.8%.

To understand the business areas in the processing industry that are most exposed to the risk of unsustainability due to the influence of the coronavirus pandemic according to perceptions of employees in processing companies in Brod-Posavina County, dimensionality of business process unsustainability was reduced by applying multi-criteria factor analysis with principal component analysis for data extraction. Before conducting factor analysis, the conditions for its application were met: Kaiser-Meyer-Olkin's sample adequacy indicator has a value of KMO of .884, while Bartlett's spherical test shows $\chi 2=639{,}293$; df=45; p<0. A correlation matrix is made and shown in Table 2.

Table 2 Correlation matrix for 10 interdependent variables from the conducted survey

	Correlations, marked correlations are significant at p < .05000 N=102									
Variable	**PSM**	**ARR**	**RPM**	**PDO**	**CO**	**CFM**	**WO**	**OBC**	**PPO**	**MPMO**
PSM	1.00									
ARR	0.77	1.00								
RPM	0.60	0.57	1.00							
PDO	0.59	0.65	0.68	1.00						
CO	0.57	0.61	0.68	0.66	1.00					
CFM	0.61	0.64	0.57	0.70	0.75	1.00				
WO	0.41	0.55	0.49	0.47	0.54	0.59	1.00			
OBC	0.51	0.60	0.55	0.55	0.60	0.50	0.54	1.00		
PPO	0.36	0.44	0.43	0.50	0.42	0.44	0.44	0.60	1.00	
MPMO	0.28	0.32	0.41	0.47	0.50	0.40	0.25	0.55	0.60	1.00

Source: Authors

Principal component analysis generates 2 factors with eigenvalues greater than 1 that explain more than 69% of the variance and can be used in further analysis based on the Kaiser-Guttman criteria, as shown in Table 2. Varimax raw rotation was applied in order to get a clearer picture of factor structures and interpretation of factors, as shown in Table 3.

Table 3 Eigenvalues of derived factors

Factors	Initial eigenvalues extraction: Principal components			
	Eigenvalue	% total variance	Cumulative eigenvalue	Cumulative %
1	5.84	58.38	5.84	58.38
2	1.08	10.76	6.91	69.15
3	0.67	6.70	7.58	75.85
4	0.60	6.01	8.19	81.86
5	0.44	4.38	8.62	86.24
6	0.42	4.23	9.05	90.47
7	0.30	3.01	9.39	93.48
8	0.27	2.73	9.62	96.22
9	0.21	2.14	9.84	98.36
10	0.16	1.64	10.00	100.00

Source: Authors

Table 4 Varimax raw rotation of derived factors showing factor loads

Variable	Factor loadings (Unrotated) Extraction: Principal components		Factor loadings (Varimax raw) Extraction: Principal components	
	Factor 1	Factor 2	Factor 1	Factor 2
PSM	-0.75	0.37	0.83	0.11
ARR	-0.82	0.29	0.84	0.21
RPM	-0.79	0.11	0.72	0.34
PDO	-0.83	0.06	0.72	0.41
CO	-0.84	0.07	0.74	0.40
CFM	-0.82	0.19	0.79	0.29
WO	-0.69	0.12	0.64	0.28
OBC	-0.78	-0.26	0.51	0.65
PPO	-0.67	-0.53	0.26	0.81
MPMO	-0.61	-0.66	0.14	0.88
Expl. var.	5.84	1.08	4.39	2.53
Prp. total	0.58	0.11	0.44	0.25

Source: Authors

Loading factor values of 0.7 or higher are used for factor interpretation as a derived dimensional structure, indicating that a particular factor separates enough variance from the considered variable. It can be determined that factor 1 carries 58.38% of the total variance of all business processes and includes business processes related to the procurement of resources, sales and delivery of products, cost and cash flow optimization and a regulatory business framework. Due to its characteristics in the context of the analysis of the business area of the processing company, this factor can be called the commercial and financial area of business. Factor 2 carries 10.76% of the total variance of all business processes and includes business processes related to product promotion and maintenance of machinery. Due to its characteristics, the interpretation of this factor does not have any meaning in the context

of the analysis of the business area of the processing company and will not be further considered as a single-dimensional structure. Although considered to be the business process most exposed to the risk of unsustainability in the conditions of the coronavirus pandemic work organization of employees is not associated with any factor. It is obvious that employees believe that this business process should be considered as a separate important business area.

In the context of macroeconomic conditions, before the COVID-19 pandemic, Croatia recorded a GDP growth trend. "The trend of real GDP growth of 2.4% in 2015, 3.5% in 2016, 3.1% in 2017, and 2.7% in 2018 continued until 2019" (Croatian National Bank, 2021). Although the GDP growth rate in 2020 was initially estimated at 3.0%, in the new circumstances after the appearance of the coronavirus, the Croatian economy experienced an extremely large decline in GDP. "The first estimate shows that quarterly GDP in the third quarter of 2020 was 10% lower compared to the same quarter of 2019. This is a slightly milder decline than in the second quarter, when it was 15.4%" (CBS, 2021). It was realistic to expect a large decline in GDP for the whole year of 2020. However, "in January 2021, the World Bank estimated that the Croatian economy fell by 8.6 % in 2020, and sees Croatia's GDP growing by 5.4% in 2021, and by 4.9% in 2022" (World Bank, 2021).

Since the processing industry contributes to GDP growth, the efficiency of the commercial and financial area of business in processing companies is of great importance for the efficiency of the economy as a whole. The confirmed employee perception of exposure of this business area leads to the conclusion that one of the important management prerequisites for achieving efficient operation of processing companies has been achieved. According to a decline in GDP and a rise in unemployment, it is clear that the coronavirus pandemic is having an impact on the entire economy. Although Croatia got out of the 2008 crisis seven years ago, some companies still bear the brunt of the crisis. For such companies, which already have certain technological backlogs, this pandemic could further deepen their problems. "The impact of COVID-19 motivates small and medium-sized enterprises to reconsider their core competencies, look for new opportunities and redefine sustainable business models more intensively and in a timely manner" (Gregurec et al., 2021). All this can be applied to large companies.

6. Conclusion

The coronavirus pandemic is leading to unprecedented changes and businesses transformations by requiring new operational and production processes. This research examines how sudden disorders, such as the coronavirus pandemic, affect business processes in processing companies in Brod-Posavina County. Business processes affected by the coronavirus pandemic are identified.

According to respondents' perceptions, the coronavirus pandemic affected all business processes. The impact of the coronavirus pandemic was investigated using descriptive statistics, and hypothesis 1 was confirmed. Statistical data analysis confirmed moderate to significant exposure of all considered business processes in processing companies to the risk of unsustainability. This is the result of awareness of employees working in processing companies in Brod-Posavina County of the inevitable impact of the coronavirus pandemic on businesses. The "work organization" business process is perceived as a business process most exposed to the risk of unsustainability, which is expected because the effect of the coronavirus pandemic on work organization implies a direct link between the coronavirus pandemic and employees. Many companies are now reinventing flexibility and sustainability. The need to ensure business sustainability has made companies keep focus through reorganization especially work organization. One of the significant observations is related to the adaptability of workers to change their communication and workplace. Many employees work from home and remote work should be promoted during the pandemic, but also all employees working remotely should have all prerequisites for doing business in such a way. Companies with these redesigns can exploit values in new ways. It is logical to assume that the demand for this method of doing business will continue to expand in the time ahead. Working remotely emerges with pros and cons that should be acknowledged in future research.

The most important result of this study is the business area that is significantly exposed to the risk of unsustainability in the conditions of the coronavirus pandemic for the processing industry. Factor analysis was used as it is considered an appropriate method for dimensionality reduction.

Factor analysis derived factor 1, which includes commercial and financial aspects of business. Con-

sequently, hypothesis H2 is accepted, which states that there is a business area that is significantly exposed to the risk of unsustainability in the conditions of the coronavirus pandemic.

Factor 1 indicates that employees in processing companies in Brod-Posavina County consider the commercial and financial business area as a segment of business most exposed to the risk of unsustainability under the influence of the coronavirus pandemic, which can be interpreted as employee awareness of the importance of commercial and financial aspects for business sustainability and which shows the existence of an understanding of the principles of entrepreneurship in society.

There is no doubt that one of the most critical challenges in dealing with the COVID-19 pandemic is to save the economy especially through a digitally transformed business.

The implication of this research should provide a better understanding of the influences of COVID-19 on processing companies and help companies to know which business area they should focus on in relation to the pandemic influence. The long-term effects of the coronavirus pandemic have yet to be determined as its immediate impact on processing companies is important.

The research has a number of limitations that can serve as guidelines for future research. The analysis was conducted in only one county in Croatia, which explains a small number of respondents. The questionnaire does not contain information whether all organizations in the sample have the same set of business processes or they are defined differently, but business processes covered in this research outline general processes in the manufacturing industry.

In future research, analysis should be conducted at the national level and then due to multiple respondents per organization, an inter-rater agreement should be concluded and single scores for each organization should be provided. Finally, within the framework of future research, analysis should be conducted in other sectors of the economy, not just the processing sector.

References

1. Akeem, L. B. (2017). Effect of Cost Control and Cost Reduction Techniques in Organizational Performance. *International Business and Management*, *14*(3), 19-26.
2. Barua, S. (2020). *Understanding Coronanomics: The economic implications of the coronavirus (COVID-19) pandemic*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3566477 https://doi.org/10.2139/ssrn.3566477
3. Carroll, N. & Conboy, K. (2020). Normalising the "new normal": Changing tech-driven work practices under pandemic time pressure. *International Journal of Information Management, 55,* 102186.
4. Central Bureau of Statistics of the Republic of Croatia (2020). *Effects of the COVID-19 pandemic on socioeconomic indicators.* https://www.dzs.hr/Hrv/Covid-19/bdp_2_q.html
5. Cohen, M. J. (2020). Does the COVID-19 outbreak mark the onset of a sustainable consumption transition?. *Sustainability: Science, Practice and Policy*, *16*(1), 1-3. https://doi.org/10.1080/15487733.2020.1740472
6. Croatian Chamber of Commerce (2020). *Counties-development diversity and economic potentials 2020 /2021.* Croatian Chamber of Commerce.
7. Croatian National Bank (2021). *Macroeconomic trends and forecasts.* https://www.hnb.hr/documents/20182/2846539/hMKP_07.pdf/1fdbc362-0af9-6959-c61b-0b1ec34c081a
8. Davenport, T. H. (1993). *Process Innovation: Reengineering Work through Information Technology*. Harvard Business School Press.
9. Dwivedi, K. Y. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International Journal of Information Management, 55,* 102211. https://doi.org/10.1016/j.ijinfomgt.2020.102211

10. Eurostat (2021). *Unemployment by sex and age-monthly data*. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=une_rt_m&lang=en

11. Evans, C. (2020). The coronavirus crisis and the technology sector. *Business Economics, 55*, 253-266. https://doi.org/10.1057/s11369-020-00191-3

12. Gajdzik, B. & Wolniak, R. (2021). Influence of the COVID-19 Crisis on Steel Production in Poland Compared to the Financial Crisis of 2009 and to Boom Periods in the Market. *Resources*, *10*(4). https://doi.org/10.3390/resources10010004

13. Government of the Republic of Croatia (2020). *The first patients with the coronavirus in Croatia are stable, have mild symptoms and are under supervision.* https://vlada.gov.hr/vijesti/prvi-oboljeli-od-koronavirusa-u-hrvatskoj-je-stabilno-ima-blage-simptome-i-nalazi-se-pod-nadzorom/28852

14. Gregurec, I., Tomičić- Furjan, M. & Tomičić -Pupek, K. (2021). The Impact of COVID-19 on Sustainable Business Models in SMEs. *Sustainability*, *13*(3). https://doi.org/10.3390/su13031098

15. Harris, J. L., Sunley, P., Evenhuis, E., Martin, P. & Harris, R. (2020). The COVID-19 crisis and manufacturing: How should national and local industrial strategies respond. *Local Economy*, *35*(4), 403-415. https://doi.org/10.1177/0269094220953528

16. International Monetary Fund (2020). *The IMF's Response to COVID-19.* https://www.imf.org/en/About/FAQ/imf-response-to-covid-19

17. Kaštelan, M. M. (2005). Process organization-concept and origins of the model with reference to the restructuring of the Croatian manufacturing industry. In Drezgić, S. (Ed). *Proceedings of the Faculty of Economics in Rijeka: Journal of Economics and Business*. (pp. 113-132). Rijeka: University of Rijeka, Faculty of Management and Business.

18. Krpan, Lj., Varga, D. & Maršanić, R. (2015). Organizational structure of procurement in business processes. *Technical Gazette, 9*(3), 327-336.

19. Kumara, A., Luthrab, S., Kumar, S. & Kazançoğlud, M. Y. (2020). COVID-19 impact on sustainable production and operations management. *Sustainable Operations and Computers*, *1*, 1-7. https://doi.org/10.1016/j.susoc.2020.06.001

20. Looy, V. A. (2021). How the COVID-19 pandemic can stimulate more radical business process improvements: Using the metaphor of a tree. *Knowledge and Process Management*, *28*(2), 107-116. https://doi.org/10.1002/kpm.1659

21. Mikić, M. (2009). Cost management in small and medium-sized manufacturing companies. In Pavković, A. (Ed). *Proceedings of the Faculty of Economics in Zagreb*. (pp., 161-176). Zagreb: Faculty of Economics in Zagreb.

22. Mohammed, A., Jaboour, A. & Diabat, A. (2021). COVID-19 pandemic disruption: a matter of building companies' internal and external resilience. *International Journal of Production Research*. https://doi.org/10.1080/00207543.2021.1970848

23. Muganyi, P. & Mbohwa, C. (2017). Maintenance Performance Measurement Gaps in Manufacturing Enterprises: Translation to Management System. *Proceedings of the International Conference on Industrial Engineering and Operations Management Bogota* (pp. 1170-1179). Bogota: IEOM Society International.

24. Nwabueze, U. & Mileski, J. (2018). Achieving competitive advantage through effective communication in a global environment. *Journal of International Studies*, *11*(1), 50-66. https://doi.org/10.14254/2071-8330.2018/11-1/4

25. Okechukwu, O., Subramoniam, R., Charnley, F., Widdifield, D., Patsavellas, J. & Salonitis K. (2020). Manufacturing in the Time of COVID-19: An Assessment of Barriers and Enablers. *IEEE Engineering Management Review*, *48*(3), 167-175. https://doi.org/10.1109/EMR.2020.3012112

26. Osbourne, S. & Hammoud, M. (2017). Effective Employee Engagement in the Workplace. *International Journal of Applied Management and Technology*, *16*(1), 50-67. https://doi.org/10.5590/IJAMT.2017.16.1.04

27. Peng, Z., Di H. & Meng, L. (2020). The impact of the COVID-19 pandemic on firms: a survey in Guangdong Province, China. *Global Health Research and Policy*, *5*, 41. https://doi.org/10.1186/s41256-020-00166-z

28. Rahman, A. & Sharma, R. B. (2020). Cash flows and financial performance in the industrial sector of Saudi Arabia: With special reference to Insurance and Manufacturing Sectors. *Investment Management and Financial Innovations*, *17*(4), 76-84. https://doi.org/10.21511/imfi.17(4).2020.07

29. Rapaccini, M., Saccani, N., Kowalkowski, C., Paiola, M. & Adrodegari, F. (2020). Navigating disruptive crises through service-led growth: The impact of COVID-19 on Italian manufacturing firms. *Industrial Marketing Management*, *88*, 225-237. https://doi.org/10.1016/j.indmarman.2020.05.017

30. Recommendations of the European Commission (2003). *Commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (2003/361/EC)*.

31. Roška, V., Buneta, A. & Papić, M. (2021). The effect of the COVID-19 pandemic on the Croatian economy. *Proceedings of the Polytechnic of Rijeka*, *9*(1), 59-78. https://doi.org/10.31784/zvr.9.1.4

32. Sataić, I. (2020). Attitudes About the Economic Impact of the COVID-19 Lockdown in the Republic of Croatia on Micro, Small and Medium Enterprises. *European Journal of Economics*, *1*(1), 22-33. https://doi.org/10.33422/eje.v1i1.44

33. Seetharaman, P. (2020). Business models shifts: Impact of COVID-19. *International Journal of Information Management, 54*, 102173. https://doi.org/10.1016/j.ijinfomgt.2020.102173

34. Shafi, M., Liu, J. & Ren, W. (2020). Impact of COVID-19 pandemic on micro, small, and medium-sized enterprises operating in Pakistan. *Research in Globalization*, *2*, 100018. https://doi.org/10.1016/j.resglo.2020.100018

35. Stojčić, N. (2020). The impact of COVID-19 pandemic on the export competitiveness of manufacturing firms in Croatia. *Economic Thought and Practice, 20*(2), 347-365. https://doi.org/10.17818/EMIP/2020/2.2

36. Tandoh, I. & Sarpong, L. (2015). The Impact of Sales Promotions on the Performance of Auto-Mobile Industries in Ghana: A Case Study of PHC Motors (Accra-Ghana). *European Journal of Business and Management*, *7*(11), 176-194.

37. Ungerman, O., Dedkova, J., Gurinova, K. (2018). The impact of marketing innovation on the competitiveness of enterprises in the context of industry 4.0. *Journal of Competitiveness, 10*(2), 132-148. https://doi.org/10.7441/joc.2018.02.09

38. Varga, M. & Strugar, I. (2016). *Information Systems in Business*. Faculty of Economics in Zagreb.

39. World Bank (2021). *Global Economic Prospects*. https://www.worldbank.org/en/publication/global-economic-prospects

40. World Health Organization (2021). *Coronavirus.* https://www.who.int/health-topics/coronavirus#tab=tab_1

41. Zhitao, X., Elomri, A., Kerbache, L. & Omri, A. (2020). Impacts of COVID-19 on Global Supply Chains: Facts and Perspectives. *IEEE Engineering Management Review*, *48*(3), 153-166. https://doi.org/10.1109/EMR.2020.3018420