DOI: 10.28934/ea.22.55.1.pp30-47

ORIGINAL SCIENTIFIC PAPER

Just-In-Time Strategy Implementation Challenges and The Organizational Structure Dimensions

Jelena Erić Nielsen[1] | Vesna Stojanović Aleksić[1] | Ana Todorović Spasenić[1]*

[1] The University of Kragujevac, Faculty of Economics, Department for Management and Business Administration, Kragujevac, Serbia

ABSTRACT

The implementation of the Just-in-Time (JIT) strategy will be successful only if each individual in the organization is maximally involved and committed to independent work tasks, with a maximum contribution to teamwork with other employees and active participation in decision making, but also planning, organizing and activity control. This research starts from the assumption that the way of organizing production lines, teamwork of employees and relationships with suppliers, as factors of successful implementation of JIT strategy, determine the parameters of the organizational structure of production companies in Serbia, whose output does not have the status of the final product, but other companies use it as an input in production. The subject of the research is a detailed analysis of the impact of the implementation of JIT strategy on the organizational structure of the production company, in order to point out the importance of harmony in the relationship between JIT strategy - the parameters of organizational structure. The goal of the research is to crystallize the strength of the relationship between the organizational structure dimensions-factors of successful implementation of the JIT strategy, aiming to make relevant theoretical and practical conclusions about the impact of each dimension of the organizational structure on achieving the maximum benefit of implementation JIT strategy by manufacturing companies. The research results showed that an adequate organizational structure is a pillar of efficient and effective implementation of JIT strategy in this category of manufacturing companies, because this production model requires strong cooperation within the company, where plants and processes must be arranged to generate efficiency and increasing productivity, while minimizing the total cost of production. Internal cooperation, whose pillar is a decentralized type of organizational structure, and cooperation with suppliers are key prerequisites for manufacturing companies, without or with minimal inventories, to ensure that production size meets demand requirements quickly and efficiently.

Key words: *JIT strategy, organizational structure, internal cooperation, cooperation with suppliers*

JEL Classification: M10, M11, D20, D24, L11, L23

INTRODUCTION

Producing only as much as required, in the smallest possible batches, with the fewest errors allowed, and in possibly short cycles, is the basis for the successful implementation of a just in time (JIT) strategy by manufacturing companies. Customer orders dictate the course of the process, determine what will be procured and to what extent, as well as what will be produced and in what period, while neutralizing the costs of keeping stocks of materials and finished

* Corresponding author, e-mail: vesnasa@kg.ac.rs

products. The organizational structure that encourages the commitment and teamwork of employees in the processes of planning, organizing and controlling is one of the key factors for the success of production without warehousing/stocking, as production based on the just in time principle is often called.

The subject of the research is the analysis of interdependence in relation to the factors of successful implementation of the JIT strategy - the dimensions of the organizational structure of the company. Given that the defined goals of the company are the basis for the formation of the strategy, it is clear that there is a conditional connection between the strategy and the organizational structure. The business practice has shown that change in strategy affects a change in organizational structure (e.g. expansion of the market requires changes in the production program, work organization and staff training), but also that changes in organizational structure may be conditioned by non-strategic moves (e.g. unplanned capacity reduction). A chief benefit of the JIT business strategy is that it provides a substantial cost saving and continuous product improvement, thus enhancing the business profitability (Green & Inman, 2006; Abdallah & Matsui, 2007; Bond, Green, & Inman, 2020). The parameters of organizational structure are an important factor in the successful implementation of the JIT strategy (Germain, Droge, & Daugherty, 1994; White, Ojha, & Ching-Chung, 2010; Kartika & Wijaya, 2015; Phogat & Gupta, 2017; Smith, 2019; Taghipour, Hoang, & Cao, 2020), and therefore they must be harmonized as to achieve the following goals: reducing storage and handling costs, reducing the need for working capital and improving the competitive advantage of the company. The main goal of the research is to point out that the organizational structure of the company must be adjusted to the goals and strategy opted for, in this case the JIT strategy, and it is important to take into account the existence of an inverse relationship in interdependence. All previous research on the relationship between the implementation of the JIT strategy and the parameters of the organizational structure analyses the interdependence in one direction, while this research seeks to indicate the existence of consistency between the variables in both directions, with special reference to business practice manufacturing companies whose customers do not have the status of final consumers. This research, compared to previous research on this topic, performed a different grouping of success factors of the JIT concept, in accordance with the specifics of business practices of manufacturing companies that do not produce consumer goods.

LITERATURE REVIEW

Challenges of JIT strategy implementation

Just in Time (JIT) is a business philosophy that extends throughout the organization and emphasizes a proactive approach to operations management (Mazany, 1995). It is considered a production methodology that aims to improve overall productivity through waste removal and quality improvement. In the manufacturing/assembly process, JIT ensures cost-effective production and delivery of only the required quality parts, in the right quantity, at the right time and in the right place, using minimal equipment, materials and human resources (Voss & Robinson, 1987).

The implementation of the JIT strategy is based on the elimination of all waste sources during purchasing, production and sales activities (Claycomb, Germain, & Dröge, 1999). It is a strategy whose basic idea is the organization of production based on the timely management and movement of goods (Ahmad, Mehra, & Pletcher, 2002; Green & Inman, 2006; Abdallah & Matsui, 2007; Bond, Green, & Inman, 2020). Each production company, oriented to the realization of JIT strategy goals, in accordance with the specifics of its production activity, must develop its own production management process, which aims at efficient and timely planning of enterprise resources (ERP) which is a link between harmonization of market requirements process (Shingo & Dillon, 1989; Turnbull, Olivert, & Wilkinson, 1992). In a large number of manufacturing companies, especially those that do not produce consumer goods, all processes are initiated by

the customer (Turnbull, Olivert and Wilkinson, 1992; Fiedler, Galletly and Bicheno, 1993; Smith, 2019), which dictates what and to what extent production dynamics will be procured, without accumulating stocks of materials and finished products. Bae and Kim (2008) argue that prefabrication and JIT delivery are important components of the lean procurement system. Behrouzi and Wong (2011) believed that there are four performance measures to assess supply chain performance lean: waste elimination, continuous improvement, JIT, and flexibility.

Hopp and Spearman (2004) concluded that efficient and effective supply chain management and customer/supplier relationship management is key support for the successful implementation of the JIT concept. These authors point out that it is wrong to equate the concept of JIT with "make-to-order production" (Hopp & Spearman, 2004), because this type of production organization will not contribute to the realization of JIT goals without implementing continuous improvement, Kanban system, even production load, employee involvement, standardization and total productive maintenance.

The key factors for the successful implementation of the JIT strategy can be classified into three categories (Koufteros & Vonderembse, 1998; Abdallah & Matsui, 2007; Kartika & Wijaya, 2015; Barkhordari & Denavi, 2017; Liu & Nishi, 2020):

- *Organization of production lines* - Successful implementation of JIT strategy is determined by the way of organization of production lines, ie. the JIT concept requires equipment layout of setup reduction and the implementation of preventive maintenance, with the aim of reducing the risk of production downtime and the implementation of the Kanban pull system (system of maximum control of stock levels and reduction of overproduction). The authors (White & Ruch, 1990; Davy et al., 1992) emphasize the “equipment layout of setup reduction” as an important factor in the success of the implementation of JIT production concept, but the analysis of the business practice of manufacturing companies found that the machines in the surveyed companies are distributed by plants according to the criterion of similarity. There are clearly defined norms for these activities, and their observance is monitored through the records of the duration of all work operations on the given machines (companies keep these records manually, through excel spreadsheets or information systems). All deviations in the defined norms are a signal for taking corrective measures in the form of redeployment of equipment and additional training of employees in order to reduce the time spent. That is why in further research the factor “equipment layout of setup reduction” is integrated into the factor “monitoring the duration of work operations”, because recording the time consumption for all activities on the machine, including settings, it gets insight into what needs to be corrected and improved in the organization of production lines, in order to generate the realization of JIT goals.
- *Relationships with suppliers* - Building long-term partnerships with suppliers, based on fairness, trust and loyalty, ensures the timely delivery of basic materials, which ensures compliance with the agreed deadlines for delivery of the final product to customers. Partnerships with suppliers are an important factor in JIT procurement, as soon as it directly affects the reduction of inventory costs (Abdallah & Matsui, 2007; Phogat & Gupta, 2017). Building long-term partnerships with suppliers has stood out in business practice as one of the key factors for quick and efficient response to changes in procurement needs and compliance with agreed delivery deadlines, especially in conditions of disturbances in the global market like the current ones caused by the Covid-19 pandemic. There was a delay in the procurement of goods, primarily from imports, due to retention at the borders and epidemiological measures. Representatives of the surveyed companies, filling in the questionnaires, clearly stated that the partnership is an important driver of compliance with delivery deadlines, but that in a pandemic, it is an important factor in minimizing delays.

- *Teamwork of employees* - Teamwork of employees, in the field of decision making and problem solving, is one of the key predictors of generating motivation of employees to maximally contribute to achieving the goals of JIT concept implementation (Fullerton & McWatters, 2001; Abdallah & Matsui, 2007; Phogat & Gupta, 2017; Taghipour, Hoang, & Cao, 2020). Chang and Lee (1996) pointed out that continuous training of employees is important for the successful implementation of the JIT concept, but that communication and teamwork among employees much more determine the success in achieving goals. It is very important to stimulate teamwork and communication among employees, especially in the field of knowledge and experience exchange, because in this way it will stimulate faster and more efficient solution of all business problems, but also the improvement of business in all domains.
- *Implementation of Quality Management System (QMS)* - defining QMS procedures and external verification of their compliance (factors "total quality control" and "focused factory"), in accordance with QMS regulations, is one of the important factors for successful implementation of the JIT concept (White & Ruch, 1990; Davy et al., 1992; Phogat & Gupta, 2007). This factor is not included in the analysis of business practice because all surveyed companies have verified business in accordance with ISO9001, which is the result of QMS principles and standards that are checked every year by external auditors, and the award of certificates of all processes.

The advantages of implementing the JIT strategy in production and sales are: improving product quality, safer production flow, higher productivity, reducing storage and handling costs, reducing the need for working capital and improving the competitive advantage of the company. The previously listed advantages most often outweigh the implementation problems: missed sales contracts, production delays caused by delays in raw materials, high logistics management costs, and an increase in transportation costs per unit of shipment.

Organizational structure as a factor of the successful implementation of the JIT strategy

The organizational structure, as an important base of a company's competitive advantage, should be proportional to the organizational goals and capabilities of employees (Soltani, Altaha, & Taheri, 2013). The goals and strategy of the company are one of the most important internal factors that determine the organizational structure. Without an adequate organizational structure, it is not possible to generate an efficient and effective implementation of any business strategy, as shown by the author's research on this topic over the last thirty years (Hall & Saisas, 1980; Miller, 1986; Galbraith, 2002; Brayan & Joyce, 2007; Chan Kim & Mauborgne, 2009; Tran & Tian, 2013; Bozkurt, Kalkan, & Arman, 2014). The parameters of the organizational structure are an important factor in generating the motivation of employees to maximally contribute to the realization of set business goals.

The organizational structure also stood out as an important factor in the successful implementation of the JIT strategy in supply, production and sales (Phogat & Gupta, 2017; Smith, 2019; Taghipour, Hoang & Cao, 2020; Liu & Nishi, 2020). Numerous studies on the factors of successful JIT strategy implementation have indicated a significant impact of organizational structure parameters on generating JIT strategy implementation goals, primarily cost reduction, continuous product improvement and improving business profitability (Germain, Droge, & Daugherty, 1994; White, Ojha, & Ching-Chung, 2010; Kartika & Wijaya, 2015; Phogat & Gupta, 2017; Smith, 2019; Taghipour, Hoang, & Cao, 2020). Each of the dimensions of the organizational structure influences some of the factors of successful implementation of the JIT strategy.

Business efficiency and harmonization of employee behaviour in the company are determined by the dimensions of the organizational structure (Hall & Saias, 1980; Galbraith, 2002; Claver-Cortes, Pertusa-Ortega & Molina-Azorin, 2012). The organizational structure allows employees to

understand their roles and contributes to easier coordination, control and communication. It is a central structural dimension of organizational design that must be aligned with the goals, strategy, specifics of process technology and the specifics of the environment in which a particular company operates (Miller, 1986; Kavale, 2012; Soltani, Altaha, & Taheri, 2013; Tran & Tian, 2013). Formal regulation of business units and activities, as well as defining the relations between these components, is in fact a system that has been designed in the long run and formally sanctioned by company documents.

The dimensions of organizational structure can be classified as follows (Hax & Majluf, 1983; Miles & Snow, 2003; Brayan & Joyce, 2007; Chan Kim & Mauborgne, 2009; Kavale, 2012; Villadsen, 2013):

- *Specialization* - Specialization of individuals and organizational units is the result of the division of labour as a basic activity of organizational design in the company. The division of labour has its horizontal and vertical dimensions. The horizontal dimension refers to the number of work tasks performed by one individual in the company, and the vertical dimension shows whether the individual is only the executor of the work or can control the work he performs. This parameter of the organizational structure provides insight into the level of concentration and stress of individuals in the company during the performance of work tasks, as well as the degree of employee turnover.
- *Departmentalization* - Departmentalization is the division of companies into narrower organizational units and defining their size. Grouping organizational units creates an image of the organizational structure of the company, which is shown through the organizational scheme. The main focuses of departmentalization are goal orientation, specialization of executors and the range of control based on minimizing the number of subordinates to one manager.
- *Coordination/control* - Coordination/control is a parameter of the organizational structure that provides a strong connection between the organizational parts of the company. Companies use one or combine several coordination/control mechanisms: 1) the existence of a chain of command, based on the harmonization of objectives at different levels of the hierarchy and supervision during their implementation, 2) standardization of inputs, work processes and outputs, 3) representation of mutual harmonization as a form coordination, based on equal and professional relationship and direct communication of participants in the execution.
- *Centralization* - Centralization and decentralization are manifestations of the delegation of authority, the process of delegating decision-making authority from senior executives to lower-ranking executives. Centralization means control from one place in the company, and decentralization means the division of control from several places in the company. The level of horizontal and vertical centralization, as well as the complexity of communication channels provide a complete insight into the centralization of management/decision-making in the company. Vertical centralization is an indicator of centralization in the domain of strategic decision-making for the entire company, and horizontal centralization in the domain of decision-making at the level of the organizational unit. The high level of centralization of management/decision-making is characterized by the complexity of communication channels, which is often highlighted as one of the key shortcomings of this emerging form of delegation of authority.

A large number of researches can be found in the literature on the topic of the importance of harmonization of organizational structure and JIT strategy for improving organizational performance. Claycomb, Germain, and Dröge (1999) surveyed 200 logistics companies to identify the impact of JIT strategy implementation on business performance, including organizational performance, mentioning the importance of organizational structure-JIT strategy compliance to generate performance improvement. Abdallah and Matsui (2007), in their research on the impact of JIT production on the performance of this system, mentioned the importance of organizational

design for generating JIT strategy implementation goals. Kartika and Wijaya (2015) also pointed out the importance of the human resources sector in generating compliance in relation to organizational structure - implementation of JIT strategy in sales. Barkhordari and Denavi (2017) cite the alignment of organizational design and JIT strategy as one of the important predictors of establishing efficient and effective supply chain management. The organizational structure was also mentioned as a factor in the successful implementation of the JIT supply strategy by the authors Liu and Nishi (2020), emphasizing that the success of the implementation of this strategy significantly depends on achieving the goals of the supply chain management.

Koufteros and Vonderembse (1998) investigated in more detail the impact of organizational structure on the level of success of JIT strategy implementation. The authors pointed out that the JIT production system is a kind of innovation that generates a competitive advantage for companies. Organizational design stood out as the basis for generating maximum benefits from the implementation of the JIT strategy, including improving competitiveness. The focus of the study was on centralization, complexity and formalization as characteristics of the organizational structure that determine the success of JIT strategy implementation. The impact of the implementation of the JIT strategy on the dimensions of the organizational structure of the company has been demonstrated in the research of the authors Green, Inman, and Birou (2011). The authors pointed out that the organization of production lines, cooperation with suppliers and teamwork of employees are important factors in generating goals for the implementation of the JIT strategy. Specialization and decentralization stood out as parameters of the organizational structure with the greatest impact on the success of the implementation of the JIT strategy in sales. This study confirmed the conclusions of Germain, Droge, and Daughtery (1994), as well as Green and Inman (2006). The authors pointed out that high specialization and decentralized management/decision-making are the parameters of the organizational structure that most contribute to the realization of the positive effects of the JIT strategy on building long-term partnerships with customers.

The previously listed researches argue that the successful implementation of the JIT strategy in supply/production/sales significantly depends on the organizational structure of the company. The dimensions of the organizational structure actually represent the base of generating the goals of the JIT strategy implementation. The high level of integration among employees in the company, specialization (high horizontal and low vertical), performance control and active participation in decision-making, stood out as the characteristics of the organizational structure that contribute most to improving the competitive advantage of companies that implement this strategy. The implementation of the JIT strategy is more successful with the support of an appropriate organizational structure (Kartika & Wijaya, 2015; Smith, 2019).

RESEARCH DESIGN AND RESULTS

The initial research model (Figure 1) and hypotheses were formulated on the basis of analysis of professional and scientific literature from the domain of the influence of organizational structure dimensions on the success of JIT strategy implementation, using the following research methods: descriptive method, analysis and synthesis method, inductive and deductive method. The combination of the previously listed methods generated the necessary data for compiling the questionnaire, which had the status of a basic tool in the research. Empirical research was conducted, using the survey method, with the aim of processing the collected data, a combination of descriptive, correlation and regression statistical analysis, to crystallize the impact of organizational structure dimensions on the success factors of JIT strategy implementation, and thus confirm or challenge the results of previous research topic.

Methodology and sample

In order to identify the impact of the implementation of the JIT strategy on the dimensions of the organizational structure of the company, an empirical study was conducted on a sample of 63 companies in the Republic of Serbia (company headquarters classified according to statistical regions of the Republic of Serbia). The research included companies from the domain of the production sector of the economy - 40% of companies belong to the industrial sector, and 60% to the sector of manufacturing crafts (the structure of the sample is shown in Table 1). The sample structure is dominated by large and medium-sized manufacturing companies. Data were collected by the method of employee surveys, during September 2020. The questionnaire was sent to the e-mail addresses of 69 production companies in the territory of the Republic of Serbia, and the response rate was 91%. All surveyed companies operate in accordance with the requirements of ISO 9001 standard (have QMS certificates) and produce goods that are not intended for final consumers, but are used as material/semi-finished product/spare part in other manufacturing companies. A simplified baseline research model is shown in Figure 1.

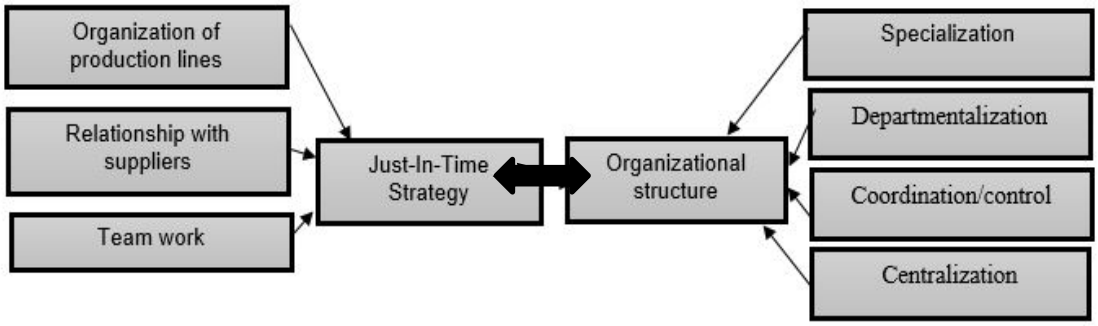

Figure 1. Baseline model for research of the relationship between factors of successful implementation of JIT strategy and dimensions of organizational structure

Source: Authors' research

The initial hypotheses on which the research is based are (Figure 1):

H_1: The way of organization of production lines, as a factor of successful implementation of JIT strategy, determines the dimensions of organizational structure.

H_2: Supplier relations, as a factor in the successful implementation of the JIT strategy, determine the dimensions of the organizational structure.

H_3: Teamwork, as a factor of successful implementation of JIT strategy, affects the dimensions of organizational structure.

Table 1. Profile of surveyed companies (n = 63)

Profile of surveyed companies	Number of companies (n)	Percentage (%)
Manufacturing activity		
Industry	25	40%
Manufacturing craft	38	60%
Headquarters (criterion - statistical regions of the Republic of Serbia)		
Belgrade	12	19%
East Serbia	7	11%
West Serbia	17	27%
South Serbia	9	14%
Šumadija	6	10%
Vojvodina	12	19%
Years of business		

Profile of surveyed companies	Number of companies (n)	Percentage (%)
up to 10 years	15	24%
10-20 years	29	46%
over 20 years	19	30%

Source: Authors' research

The factors of successful implementation of the JIT strategy have the status of independent variables, and the dimensions of the organizational structure have the status of dependent variables. All previously listed variables are evaluated over three statements, using a five-point Likert scale. Representatives of the surveyed companies, by filling out the questionnaire, expressed their views on the statements, with grades from 1 to 5, where 1 means "absolutely disagree with the given statement", and 5 "absolutely agree". The collected data were processed through SPSS software, with descriptive, correlation, and regression statistical analysis. Descriptive statistical analysis was conducted with the aim of assessing the homogeneity of data by enterprises. The focus of the correlation analysis was a detailed analysis of the existence and strength of the relationships among all the variables that are the subject of the research. After that, a regression analysis was conducted, with the aim of identifying the impact of independents on the dependent variables, which will highlight the dimensions of the organizational structure that dominantly determine the success of the implementation of the JIT strategy.

Research results

The obtained results of descriptive statistical analysis are presented in Tables 2 and 3. According to the variables, for each of the statements, by implementing descriptive statistics, the arithmetic mean and standard deviation were calculated. Table 2 presents the results of descriptive statistics for findings related to independent variables - factors of successful implementation of JIT strategy in manufacturing companies, and Table 3 results related to dependent variables - dimensions of organizational structure of manufacturing companies in the Republic of Serbia.

Table 2. Results of descriptive statistical analysis - factors of successful implementation of JIT strategy

Statements relating to independent variables	Mean	Std. deviation
Organization of production lines		
Monitoring the time duration of operations in the production	3.46	1.2550
Implementation of preventive maintenance with the aim of reducing the risk of production downtime	2.84	1.0350
Implementation of Kanban pull system	3.44	1.2924
Relationships with suppliers		
Intensive work on the development of long-term partnerships with suppliers	3.81	1.0295
Timeliness of deliveries by strategic suppliers	3.18	1.1150
Quality of delivery of strategic suppliers	3.62	0.7917
Teamwork		
Teamwork on improving the quality of production	3.78	1.0387
Teamwork on improving the cost efficiency of production processes	3.41	1.0570
Teamwork in the field of problem-solving	3.33	0.9672

Source: Authors' research

The table 2 presents the current situation in the field of implementation of JIT strategy by manufacturing companies in the Republic of Serbia. It can be noticed that most attention is paid to intensive work on the development of long-term partnerships with suppliers of strategic

materials (arithmetic mean 3.81), with the aim of ensuring timely deliveries (arithmetic mean 3.18) of materials of satisfactory quality (arithmetic mean 3.62), without unnecessary stockpiling. Significant attention is paid to teamwork among employees, primarily in the field of improving the quality of production (arithmetic mean 3.78) and generating cost efficiency (arithmetic mean 3.41). The negative side of the current situation in the field of implementation of JIT strategy by companies in Serbia is the fact that the least attention is currently paid to the implementation of preventive maintenance, with the aim of reducing the risk of production downtime (arithmetic mean 2.84). Although the representatives of the surveyed companies gave satisfactory assessments regarding the monitoring of the duration of production operations (arithmetic mean 3.46) and the implementation of the Kanban pull system (arithmetic mean 3.44), the fact is that insufficient commitment to preventive maintenance can lead to collapse in the production process and cancel positive effects of previously enumerated determinants of the organization of production lines. The values of the standard deviation, for all statements, range from 0.7917-1.2924, which indicates a similar degree of disagreement (heterogeneity) of the respondents in the assessments of all nine statements.

Table 3 presents the specifics of organizational structures of the surveyed companies. It can be noticed that all parameters of the organizational structure were evaluated in the range of 3.03-3.65, which implies the existence of moderate specialization (arithmetic mean 3.59), i.e. employees, as representatives of the surveyed companies, stated that in them there is a moderate range of activities assigned to one job, but there is no independence in performing tasks and controlling their execution in each company. Some of the surveyed employees stated that this is one of the advantages of the companies in which they work, and these are employees who value work with less concentration and stress (average score 3.56). Regarding the criteria for grouping organizational units, the orientation towards goals (arithmetic mean 3.65) and the orientation towards the specialization of executors (3.56) dominate, which coincides with the existence of moderate specialization. The existence of a chain of command, based on the harmonization of objectives at different levels of the hierarchy and supervision during their implementation, and the standardization of inputs/work processes/outputs are predominantly coordinated / control mechanisms in the surveyed companies (arithmetic mean 3.62). In the surveyed companies, there is a mediocre centralization in the domain of decision-making, somewhat higher in the vertical than in the horizontal direction, with the lack of excessive complexity of communication channels (arithmetic mean 3.09). The values of the standard deviation range from 0.8837-1.3779, which implies the existence of relative homogeneity of the respondents' attitudes regarding the parameters of the organizational structure in the production sector of the Republic of Serbia.

Table 3. Results of descriptive statistical analysis – dimensions of organizational structure

Statements relating to dependent variables	**Mean**	**Std. Devaition**
Specialization		
There is a high level of specialization - horizontally/vertically	3.59	1.1018
Work with less concentration and stress	3.56	1.1184
High degree of fluctuation due to monotony	3.27	0.8837
Departmentalization		
Goal orientation as a focus of departmentalization	3.65	1.0948
Execution specialization as a focus	3.56	1.0743
Range of control - focus on minimizing the number of subordinates to one manager	3.51	1.1053
Coordination/control		
Existence of a chain of command	3.62	1.0690
Standardization of inputs, workflows and outputs	3.62	1.0690
Representation of mutually harmonization	3.44	1.0438
Centralization		
High centralization in the horizontal direction	3.05	1.2238

Statements relating to dependent variables	Mean	Std. Devaition
High centralization in the vertical direction	3.14	1.3779
Complexity of communication channels	3.03	1.2948

Source: Authors' research

For each of the previously listed independent and dependent variables, a reliability analysis was performed according to Cronbach's alpha coefficient model, whose values range from 0 to 1 (Leech, Barrett, & Morgan, 2005). Nunnally (1978) recommends that the confidence threshold should not be less than 0.7, which is not violated in this study (Table 4).

Table 4. Values of Cronbach's alpha coefficients - reliability of statements

Variable	Cronbach's alpha
Organization of production lines	0.977
Relationships with suppliers	0.914
Teamwork	0.954
Specialization	0.952
Departmentalization	0.981
Coordination/control	0.985
Centralization	0.961

Source: Authors' research

After the reliability analysis, a correlation analysis of all variables was performed in order to identify the relationship that exists between each of them. The results presented the existence of a statistically significant correlation among all variables that are the subject of research. All statistically significant correlations are indicated in Table 5 with ** (** denotes $p \leq 0.01$). Guided by Cohen's recommendation (Cohen, 1988), all correlations can be considered strong because the relationship between each of the two variables is shown by a correlation coefficient greater than 0.5, which is an indicator of a strong relationship. A statistically significant positive correlation was identified between all factors generating the successful implementation of the JIT strategy, as well as between these factors and specialization, departmentalization and coordination/control, as parameters of organizational structure ($r>0.9$). Statistically significant, strong, negative, the correlation was observed in the relation of centralization-factors of successful implementation of JIT strategy, which implies that centralized management and decision-making negatively affects the efficient and effective implementation of JIT strategy of surveyed companies. The existence of a negative correlation was identified between centralization and other dimensions of the organizational structure, which indicates that the surveyed companies do not apply fully centralized management and decision-making because they are aware of their negative impact on business and the positive effects of JIT supply/production/sales strategy. This confirmed the results of research on the negative impact of centralization on the creation of an organizational design that will encourage the best possible results of the implementation of the JIT strategy.

Table 5. Results of correlation analysis

	Organization of PL	Relationships with suppliers	Teamwork	Specializ.	Depart.	Coord/control	Centr.
Organization of PL	1	0.950**	0.978**	0.965**	0.965**	0.962**	-0.879**
Relationships with suppliers	0.950**	1	0.966**	0.937**	0.928**	0.920**	-0.839**
Teamwork	0.978**	0.966**	1	0.965**	0.967**	0.962**	-0.862**
Specialization	0.965**	0.937**	0.965**	1	0.928**	0.987**	-0,905**
Departmentalization	0.965**	0.928**	0.967**	0.982**	1	0.989**	-0.872**
Coordination/control	0.962**	0.920**	0.962**	0.987**	0.989**	1	-0.884**
Centralization	-0.879**	-0.839**	0.862**	-0,905**	-0.872**	-0.884**	1

*PL-production lines

Source: Authors' research

After the correlation analysis, four regression analyses were conducted, with the aim of identifying the impact that each of the factors of successful implementation of the JIT strategy has on each of the parameters of the organizational structure of the company. In the first regression, the influence of the factors of successful implementation of the JIT strategy on specialization as a dependent variable was analysed (Table 6). The model as a whole explains 94.1% of the variance of the dependent variable ($R^2 = 0.941$; $p < 0.01$).

Table 6. Table of regression coefficients - specialization as a dependent variable

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
Organization of production lines	.403	.130	.476	3.095	**.003**
Relations with suppliers	.042	.133	.039	.315	.754
Teamwork	.470	.188	.462	2.499	**.010**

Source: Authors' research

The organization of production lines stood out as a factor in the successful implementation of the JIT strategy, which mostly determines the level of horizontal and vertical specialization in the surveyed manufacturing companies ($p < 0.01$). The impact that teamwork has on the level of specialization ($p = 0.01$) can also be considered quite significant. Representatives of the surveyed companies stated that monitoring the duration of operations, implementation of the Kanban pull system and teamwork affect specialization by encouraging a high level of horizontal and a low level of vertical specialization, i.e. the focus is on employees performing a narrow range of similar work tasks, having independence in their work and being able to control the work tasks they perform. Stimulation of teamwork among employees statistically most significantly determines departmentalization (Table 7), i.e. manner and focus of grouping of organizational parts of surveyed companies ($p < 0.01$). The model as a whole explains 93.8% of the variance of the dependent variable ($R^2 = 0.938$; $p < 0.01$).

Table 7. Table of regression coefficients - departmentalization as a dependent variable

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
Organization of production lines	.341	.140	.374	2.432	.018
Relations with suppliers	.123	.143	.106	.856	.395
Teamwork	.769	.203	.702	3.798	**.000**

Source: Authors' research

The organization of production lines and teamwork among employees are factors that predominantly determine the mechanisms of coordination and control in the surveyed companies (Table 8). Monitoring the duration of operations, preventive maintenance, and implementation of the Kanban pull system determine the combination of coordination/control mechanisms that companies with a JIT strategy will apply. The same impact has stimulation of teamwork among employees in the field of improving the quality and cost efficiency of production processes. The overall model shown in Table 8 explains 93.6% of the coordination/control variance as a dependent variable ($R^2 = 0.936$; $p < 0.01$).

Table 8. Table of regression coefficients - coordination/control as a dependent variable

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
Organization of production lines	.450	.142	.505	3.164	**.002**
Relations with suppliers	.181	.145	.158	1.248	.217
Teamwork	.663	.205	.620	3.229	**.002**

Source: Authors' research

Table 9. Table of regression coefficients - centralization as a dependent variable

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
Organization of production lines	-.938	.065	-.879	-14.394	**.000**
Relations with suppliers	-.151	.095	-.839	-12.063	**.000**
Teamwork	-1.104	.083	-.862	-13.308	**.000**

Source: Authors' research

In the next regression, centralization has the status of a dependent variable (Table 9). The model explains 77.3% of the variance of the dependent variable (R2= 0.773; p <0.01). The regression coefficients in Table 9 showed that all factors of the JIT strategy statistically significantly affect centralization as a dependent variable (p<0.01), and the values of the t test clearly indicate the negative impact, which confirmed the results of the correlation analysis. The conclusion is that centralization negatively affects the success of the implementation of the JIT strategy. Decentralization, primarily in the field of decision-making, is a key predictor of efficient organization of production lines, stimulating employees to contribute to building long-term partnerships with suppliers and making decisions, and solving problems as a team. The greatest contribution of decentralization is reflected in the motivation of employees to maximally contribute to the efficient and effective implementation of the JIT strategy.

Discussion of research results

The results of the correlation analysis indicated the existence and strength of the connection between the factors of successful implementation of JIT strategy and dimensions of organizational structure, while the results of regression analysis enabled conclusions on the impact of each factor of JIT strategy on each dimension of the organizational structure of surveyed manufacturing companies in Serbia. Summarizing the conclusions of the previously described analyses, the final conclusions about the initial hypotheses are drawn:

- The way of organization of production lines, as a factor of successful implementation of JIT strategy, statistically significantly determines the dimensions of organizational structure (specialization, departmentalization, coordination/control and centralization) - ***partially confirmed hypothesis H_1***. The results of correlation analysis indicated a strong correlation between the way of organizing production lines and all parameters of the organizational structure of the company, but the results of regression analysis showed that monitoring the duration of operations, preventive maintenance, and implementation of the Kanban pool system statistically significantly determine high horizontal and low vertical specializations, a combination of coordination/control mechanisms and decentralized decision-making. The influence of the organization of production lines on the manner and focus of departmentalization, by regression statistical analysis, did not stand out as statistically significant. The results of the research actually show that the specialization of employees in performing a narrow circle of related production activities

affects a good knowledge of the production process, the duration of activities and the work of machines on which they are performed (with knowledge of working standards for each machine). In a conversation with the representatives of the production of the surveyed companies, it was stated that the employees are trained to keep records of machine standards and to eliminate the most frequent failures on a number of related machines and to operationally fully know the machines on which they work, and these are machines that make up one production plant, for example: 1) operation and repairs of several different lathes in tool department, with regular updating of records on scrap which are the basis for the implementation of corrective measures 2) operation, minor repairs and adjustments for machines that produce several different variants of springs/bearings/cups, 3) handling, installation of furnaces (temperature adjustment) and solving delays in the operation of furnaces for different alloys of brass, lead, aluminium in foundries. That is why specialization determines efficient control over the duration of production activities, as well as fast and efficient resolution of a large number of production delays, which is directly reflected in the goals of Kanban pull system implementation - control of inventory levels and minimization of waste in production. Employees in production plants, under the supervision of the operational manager, in most of the surveyed companies manually, via Excel spreadsheets or records in the information system, work performance for each operation on a given machine (comparison with standards), enters material consumption for each operation and records scrap, which are very useful data sources for defining preventive and corrective measures in the cooperation of operational-strategic management in the field of eliminating downtime and waste in production. The practice of the surveyed companies showed that the combination of coordination/control mechanisms (standardization of inputs, outputs and processes) and decentralized decision-making stimulate qualified personnel to be more committed to efficient production activities, regular monitoring of deviations from working standards for each production machine and efficient performance of preventive and ongoing maintenance activities, which is the core of successful implementation of JIT strategy in production.

- Relations with suppliers, as a factor in the successful implementation of the JIT strategy, statistically significantly determines the dimensions of the organizational structure - ***partially accepted hypothesis H_2***. The construction of long-term partnerships with strategic suppliers, according to the results of correlation analysis, is strongly positively correlated with specialization, departmentalization and coordination/control, but the strength of the impact on them, according to regression analysis, did not stand out as statistically significant. Decentralization has the strongest impact on the quick and efficient reaction to the supplier's moves and minimizing all problems that may arise in business cooperation with the supplier, primarily delays in delivery. The results of correlation and regression analysis showed that centralization of management and decision making harms the successful implementation of JIT strategy in manufacturing companies, because it discourages employees from building long-term partnerships with suppliers and working as a team to improve quality/cost efficiency and efficiently solve all problems in supply/production/sale. The business practice of the surveyed companies presented that the involvement of employees in planning, organizing, and controlling the production activities, stimulates them to monitor the timeliness of procurement and respond quickly to any delay in delivery of strategic raw materials, in the aim to prevent production delays and exceeding agreed delivery deadlines final product to customers. Partner relations between the supplier and the manufacturing company are the core of greater motivation of suppliers to generate satisfaction and loyalty of manufacturing companies as their customers by respecting all agreed terms of cooperation. The surveyed companies stated that the importance of developed partnerships and stimulating employees, primarily in the Supply Department, to contribute to their maintenance, is

most pronounced in conditions of market instability, such as those caused by the Covid-19 pandemic. During the period end 2020 - the first half of 2021 was marked by a "rampage" of metal prices on the stock market, with a shortage of a large number of raw materials, and developed partnerships crystallized as a lifeline because suppliers always had in mind the needs of their most loyal customers (production reduction did not include orders from strategic partners).

Teamwork, as a factor in the successful implementation of the JIT strategy, statistically significantly affects the dimensions of the organizational structure - ***fully confirmed hypothesis H_3***. Stimulating teamwork among employees, in the field of quality improvement and cost efficiency, as well as in the field of fast and efficient problem solving, dominantly dictates the creation of an organizational structure that will contribute to the efficient and effective implementation of the JIT strategy. The results of correlation and regression analysis showed that teamwork is the only factor in the successful implementation of the JIT strategy that statistically significantly determines all dimensions of the organizational structure of the surveyed manufacturing companies in Serbia. High horizontal and low vertical specialization, combining coordination/control mechanisms and decentralized decision-making are parameters of organizational structure that, according to the business practice of surveyed manufacturing companies, stimulate employees to maximally engage in the efficient and effective performance of work tasks and so contribute to generating maximum benefits from the implementation of JIT strategy in production. In a conversation with representatives of surveyed companies, it was stated that training and development of employees in all domains is an important factor in achieving the goals of the JIT concept, but that it is much more important to stimulate communication and teamwork among employees to create the stimulating environment for respecting all the principles of application of the JIT concept in procurement, production, and sales. Teamwork of employees of the surveyed companies (all organizational parts of the company) in the period 2020-2021. was most pronounced in the detailed parallel analysis of business risks in the Covid-19 pandemic, analysis of the current situation in the implementation of sales plans and production/supply plans arising from them, in order to find preventive solutions to all potential delays in procurement, production, and sales.

It can be concluded that an adequate organizational structure is one of the key factors in the successful implementation of the JIT strategy in the surveyed manufacturing companies. High horizontal and low vertical specialization, goal-oriented departmentalization, combination of coordination/control mechanisms and decentralized management/decision-making are parameters of organizational structure that stimulate the realization of JIT strategy implementation goals: production in accordance with market needs, high product quality, short production cycle, pull a system based on appropriate planning techniques, efficient material management, reduction of inventory levels, engagement of all employees and building long-term partnerships with customers and suppliers.

The research singled out specialization and decentralization as dimensions of the organizational structure with the greatest impact on the success of the implementation of the JIT strategy, which confirmed the conclusions of previous research on this topic. Koufteros and Vonderembse (1998) proved that high centralization of management negatively affects the success of the implementation of the JIT production system, which coincides with the results of this research. The results of statistical analyses confirmed the conclusions of Germain, Droge, and Daughtery (1994), Green and Inman (2006), and Liu and Nishi (2020), that high specialization and decentralized management/decision making are the parameters of organizational structure that contribute most to the realization of positive effects of JIT strategy to build long-term partnerships with customers and suppliers, as key partners in the supply chain. The organization of production lines, cooperation with suppliers and teamwork of employees, as factors of successful implementation of JIT strategy, individually determine at least two parameters of organizational structure, showed the results of testing initial hypotheses, which reaffirmed the conclusion of Green, Inman and Bureau (2011). Decentralization is a parameter of the

organizational structure that mostly determines the motivation and entrepreneurial innovation of employees (Eric Nielsen et al., 2019), which directly reflects on their productivity, and thus contributes to generating goals for the implementation of the JIT strategy.

Teamwork of employees is the core of successful implementation of JIT strategy and is the statistically most significant factor that determines all parameters of organizational structure. Representatives of the surveyed companies stated that the dimensions of the organizational structure significantly determine the motivation and commitment of employees in the field of organizing production lines, building long-term partnerships with suppliers and teamwork in various areas of improvement (confirmed conclusions Kartika and Wijaya, 2015).

The research confirmed that the implementation of the JIT strategy will be successful only if each employee in the company is maximally involved and committed to the independent execution of work tasks (which was also emphasized by Koufteros and Vonderembse, 1998). Training of employees to work as a team on monitoring the efficiency of Kanban pull system implementation is the basis of cost efficiency and timeliness of the production process, Smith points out in the research on JIT strategy (Smith, 2019), which is confirmed by the results of this research. The fact is that the organizational structure should follow the JIT strategy (Brayan & Joyce, 2007; Bozkurt, Kalkan, & Arman, 2014), and the teamwork of employees is an essential factor to generate maximum benefits for the manufacturing company through their compliance (Koufteros & Vonderembse, 1998; Fullerton & McWatters, 2000; Abdallah & Matsui, 2007).

Theoretical/practical implications and further directions of research

This research brings together the conclusions of the previously listed authors, but, unlike previous research on this topic, a two-way relationship has clearly crystallized between the factors of successful implementation of the JIT concept - the parameters of organizational structure. It has been proven that the parameters of the organizational structure must be adjusted to the goals of JIT strategy implementation, but at the same time, without the support of the appropriate organizational structure and its parameters, it is impossible to generate a positive influence of successful JIT concept on the realization of set goals. The research represents a deeper analysis in this domain, with special reference to the production segment of the economy, whose outputs represent significant inputs in other industries. No research so far has focused exclusively on the business practice of this category of companies, and since their outputs are inputs in other companies, their success in implementing the JIT concept significantly determines the success in managing their customers' supply chains. This indirectly points to the importance of compliance with the factors of successful implementation of the JIT concept - the parameters of the organizational structure for building partnerships of companies in the field of this production sector with its customers and suppliers, and thus the management of all relationships in the supply chain. The results of the research provide guidance to managers of this industry segment on what needs to be corrected and improved in the field of harmonization of JIT factors and organizational structure parameters in order to generate goals for the implementation of this strategy, while signal how to establish efficient and effective supply chain management, supplier relationship management, logistics management and customer relationship management.

Monitoring the evolution of the dimensions of the organizational structure, with an analysis of how this evolution affects the generation of goals for the implementation of the JIT strategy, would significantly improve research in the field of the interdependence of organizational structure and implementation of the JIT strategy. Research in this domain would significantly improve and monitor the way in which changes in the factors of successful implementation of JIT strategy, organization of production lines/relationships with suppliers/teamwork, determine the evolution of the dimensions of the organizational structure. It is important, in the coming period, to deepen the analysis of the impact of compliance on the relationship factors of successful implementation of JIT concept-parameters of the organizational structure of manufacturing

companies on the realization of supply chain management goals of their customers, who use the outputs of these companies as inputs in production. This will significantly deepen the research in the field of correlation of JIT goals and supply chain management goals that are intertwined, but also the importance of partnership between participants in the supply chain in order to generate the goals of the JIT concept.

CONCLUSION

The research proved the existence of a strong feedback correlation between the factors of successful implementation of the JIT concept - the parameters of the organizational structure, through the analysis of business practices of manufacturing companies that do not produce consumer goods. The results showed that the parameters of the organizational structure must be adjusted to the principles of the JIT concept, but that at the same time it is impossible to implement this strategy and realize its goals without the support of the appropriate organizational structure. High horizontal and low vertical specialization, goal-oriented departmentalization, a combination of coordination/control mechanisms and decentralized management/decision-making are dimensions of organizational structure that stimulate the realization of JIT strategy implementation goals: production in accordance with market needs, high product quality , short production cycle, pull a system based on appropriate planning techniques, efficient material management, reduction of inventory levels, engagement of all employees and building long-term partnerships with customers and suppliers. The research represents a deeper analysis in the domain of implementation of the JIT concept in the manufacturing sector whose outputs represent significant inputs in other industries. No research so far has focused exclusively on the business practice of this category of companies, and since their outputs are inputs in other companies, their success in implementing the JIT concept significantly determines the success in managing their customers' supply chains. This indirectly points to the importance of compliance with the factors of successful implementation of the JIT concept - the parameters of the organizational structure for building partnerships of companies, in the field of this production sector, with its customers and suppliers, and thus the management of all relationships in the supply chain. The goals of the JIT concept implementation are intertwined with the goals of establishing efficient and effective supply chain management, about which deeper analyses can be conducted in future researches.

REFERENCES

Abdallah, A. and Matsui, Y. 2007. ''The Relationship between JIT Production and Manufacturing Strategy and their Impact on JIT Performance.'' Paper Presented at the 18th annual Conference on Production and Operations Management Science, 4-7 May, Dallas, Texas, U. S. A.

Ahmad, A., Mehra, S., and Pletcher, M. 2002. ''The Declining Need For Traditional Performance Measures In JIT Practices.'' *Journal of Business Administration*, 1:2.

Bae, J. and Yong-Woo, K. 2008. ''Sustainable Value on Construction Projects and Lean Construction.'' *Journal of Green Building*, 3: 156-167.

Barkhordari, R. and Denavi, H. 2017. ''Just-In-Time (JIT) Manufacturing and its Effect on the Competence of Supply Chain and Organizational Performance in the Tile and Ceramic Industry in Yazd Province.'' *Journal of Knowledge Management*, 2(1): 8-19.

Behrouzi, F. and Wong, K. 2011. ''Lean performance evaluation of manufacturing systems: A dynamic and innovative approach.'' *Procedia CS*, 3: 388-395

Bond, P. L., Green, K. W., and Inman, A. 2020. ''Relationships among JIT practices: an interpretive modeling approach.'' *Production Planning & Control -The Management of Operations,* 31(5): 400-411.

Bozkurt, O., Kalkan, A., and Arman, M. 2014. ''The Relationship between Structural Characteristics and Followed Business Strategy: An Application in Denizli.'' *Procedia-Social and Behavioral Sciences*, 150: 222-229.

Brayan, L. L and Joyce, C. I. 2007. ''Better strategy through organizational design.'' *The McKinsey Quarterly*, 22-29.

Chan Kim, W. and Mauborgne, R. 2009. ''How Strategy Shapes Structure.'' *Harvard Business Review*, September 2009 Issue.

Chang, D. and Lee, S. 1996. ''The impact of critical success factors of JIT implementation on organizational performance.'' *Production Planning & Control*, 7(3): 329-338.

Claver-Cortes, E., Pertusa-Ortega, E.M., and Molina-Azorin, J. F. 2012. ''Characteristics of organizational structure relating to hybrid competitive strategy: Implications for performance.'' *Journal of Business Research*, 65: 993-1002.

Claycomb, C., Dröge, C., and Germain, R. 1999. ''The Effect of Just-in-Time with Customers on Organizational Design and Performance.'' *The International Journal of Logistics Management*, 10(1): 37-58.

Claycomb, C., Germain, R., and Dröge, C. 1999. ''Total system JIT outcomes: inventory, organization and financial effects.'' *International Journal of Physical Distribution & Logistics Management*, 29(10): 612-630.

Davy, J.A., White, R., Merritt, N., and Gritzmacher, K. 1992. ''A derivation of the underlying constructs of just-in-time management systems''. *Academy of Management Journal*, 35 (3): 653–670.

Eric Nielsen, J., Babic, V., Stojanovic-Aleksic, V., and Nikolic, J. 2019. ''Driving forces of employees' entrepreneurial intentions – leadershup style and organizational structure.'' *Management: Journal of Sustainable Business and Management Solutions in Emerging Economies*, 24 (3): 59-69.

Fiedler K, Galletly J.E., and Bicheno J. 1993. ''Expert advice for JIT implementation.'' *International Journal of Operations and Production Management*, 13(6):23–30.

Fullerton, R., and McWatters, C. 2001. ''The production performance benefits from JIT implementation.'' *Journal of Operations Management*, 19:81–96.

Galbraith, J. R. 2002. ''Designing Organizations: An Executive Guide to Strategy, Structure, and Process.'' Jossey-Bass, San Francisco.

Germain, R., Droge, C., and Daugherty, P. 1994. ''The Effect of Just-in-Time Selling on Organizational Structure: An Empirical Investigation.'' *Journal of Marketing Research*, 31(4).

Green, K.W. and Inman, R.A. 2006. ''Does implementation of a JIT-with-customers strategy change an organization's structure.'' *Industrial Management & Data Systems*, 106(8): 1077-1094.

Green, K.W., Inman, R.A., and Birou, L.M. 2011. ''Impact of JIT-selling strategy on organizational structure.'' *Industrial Management & Data Systems*, 111(1): 63-83.

Hall, D. and Saias, M. A. 1980**.** ''Strategy Follows Structure.'' *Strategic Management Journal*, 1:149-163.

Hax, A. and Majluf, N. 1983. ''Organization Design: A Case Study on Matching Strategy and Structure.'' *Journal of Business Strategy*, 4 (2):72-86.

Hopp, W. J., & Spearman, M. L. 2004. To pull or not to pull: what is the question?. *Manufacturing & service operations management*, 6(2), 133-148. DOI: 10.1287/msom.1030.0028

Kartika, C. and Wijaya, O. 2015. ''Model Relationship between Organizational Structure, Strategy Evaluation, Jit Selling Strategies, Competence Market, Orientation Was Strategies on the Balanced Score Card, Process Organization, Effects Associated Organisations In Improving Performance Measure Manufacturing Company East Java.'' *International Journal of Business and Management Invention*, 4(1): 14-21.

Kavale, S. 2012. ''The connection between strategy and structure.'' *International Journal of Business and Commerce*, 1(6): 60-70.

Koufteros, X. A. and Vonderembse, M. A. 1998. ''The impact of organizational structure on the level of JIT attainment: Towards theory development.'' *International Journal of Production Research*, 36 (10): 2863-2878.

Leech, N., Barrett, K., and Morgan, G. 2005. ''SPSS for Intermediate Statistics.'' Lawrence Erlbaum Associates Inc., New Jersey.

Liu, Z. and Nishi, T. 2020. ''Analyzing just-in-time purchasing strategy in supply chains using an evolutionary game approach.'' *Journal of Advanced Mechanical Design, Systems, and Manufacturing*, 14:5, 1-18.

Mazany, P. 1995. ''Lessons from the Progressive Implementation of Just-in-Time in a Small Knitwear Manufacturing.'' *International Journal of Operations and Production Management*, 15.

Miles, R. E. and Snow, C. C. 2003. ''Organizational Strategy, Structure and Process.'' Stanford University Press, Stanford, CA.

Miller, D. 1986. ''Configurations of Strategy and Structure: Towards a Synthesis.'' *Strategic Management Journal*, 7(3): 233-249.

Phogat, S. and Gupta, A. 2017. ''Theoretical analysis of JIT elements for implementation in maintenance sector.'' *Uncertain Supply Chain Management*, 5: 187–200.

Shingo, S. and Dillon, A. P. 1989. ''A study of the Toyota production system: From an Industrial Engineering Viewpoint.'' CRC Press.

Smith, A. 2019. ''JIT Inventory Management Strategy - Handbook of Research on Transdisciplinary Knowledge Generation.'' IGI Global Publishing.

Soltani, M. D., Altaha, H. R. and Taheri, H. 2013. ''Studying the Relationship between Organizational Structure and Selecting Decision Making Strategy (Case Study: Merged Public Organizations in Kerman).'' *International Journal of Economy, Management and Social Sciences*, 4(56): 824-830.

Taghipour, A., Hoang, P., and Cao, X. 2020. ''Just in Time/Lean Purchasing Approach: An Investigation for Research and Applications. *Journal of Advanced Management Science*, 8(2): 43-48.

Tran, Q. and Tian, Y. 2013. ''Organizational Structure: Influencing Factors and Impact on a Firm.'' *American Journal of Industrial and Business Management*, 3: 229-236.

Turnbull, P., Oliver, N., and Wilkinson, B. 1992. ''Buyer-Supplier Relations in the UK Automotive Industry: Strategic Implications of the Japanese Manufacturing Model.'' *Strategic Management Journal*, 13 (2): 159–68.

Villadsen, A. R. 2013. ''Similarity or Difference? The Relation Between Structure and Strategy Isomorphism in Public Organizations.'' *British Journal of Management*, 24: 562-572.

Voss, C.A. and Robinson, S.J. 1987. ''Application of Just-in-time manufacturing techniques in the UK.'' *International Journal of Operations and Production management*, 7(4): 46-52.

White, R., Ojha, D., and Ching-Chung. 2010. ''A competitive progression perspective of JIT systems: evidence from early US implementations.'' *International Journal of Production Research,* 48(20): 6103-6124.

White, R.E. and Ruch, W.A. 1990. ''The composition and scope of JIT.'' *Operations Management Review*, 7(3/4): 9–18.

Article history:	Received: January 24, 2022
	Revised: April 28, 2022
	Accepted: May 25, 2022