

PROCESS MANAGEMENT AS A DETERMINANT OF ESTABLISHING A SUCCESSFUL SUPPLY CHAIN MANAGEMENT IN THE MANUFACTURING SECTOR OF THE ECONOMY

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ABSTRACT

Process management (PM), based on compliance with the requirements of the Quality Management System and ISO 9001 standards, is a key predictor of generating business excellence in manufacturing companies. Management of the Procurement, Production, and Sales processes is determinant of the success of supplier relationship management and customer relationship management, which ultimately determines the success of manufacturing companies in establishing efficient and effective supply chain management (SCM). The practice of business excellence manufacturing companies (winners of the business excellence awards) has shown that the interdependence of the relationship between PM and SCM success is the key to generating long-term, sustainable business success in all markets in which the company operates. An empirical study was conducted on a sample of 113 manufacturing companies in the Republic of Serbia. It has been proven that the realization of target performance management processes, Procurement, Production, and Sales, directly affects the realization of target performance management supply chain of manufacturing companies. Internal integration, integration with suppliers, and integration with customers, as determinants of PM success, statistically significantly and directly determine each of the qualitative indicators of target performance of SCM (measured by customer satisfaction): product quality, timeliness of delivery, minimizing complaints, respecting customer suggestions, and price competitiveness.

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Key words: *process management, supplier relationship management, customer relationship management, supply chain management, business excellence of manufacturing company.*

1. INTRODUCTION

The practice of business-leading manufacturing companies, winners of the EFQM (European Foundation for Quality Management) and FQCE (Foundation for the Culture of Quality and Excellence) business excellence awards, has demonstrated that establishing efficient and effective process management is the key to long-term, sustainable business success. Relevant literature¹ also confirms the importance of successful process management for achieving the level of business excellence through its impact on the success of all areas of management (supplier relationship management, customer relationship management, supply chain management, risk management, quality management system, strategic management, and financial management). Modern conditions of high risk and uncertainty, predominantly driven by current geopolitical circumstances and US customs policy, impose on manufacturing companies continuous work on improving the efficiency and effectiveness of management of all processes to generate successful supply chain management and survive in the market. It is a real challenge to ensure the timely delivery of quality semi-finished products/products to customers at favorable commercial terms, and this business goal cannot be achieved without ensuring the positive effects of interdependence in the relationship between the Procurement process management, Production process management, and Sales process management. Each of the previously listed dimensions of process management coincides with the dimensions of organizational integration (internal integration, integration with suppliers, and integration with customers), key determinants of the realization of the target performance of supply chain management².

The first part of the paper analyzes process management as a determinant of the efficiency and effectiveness of manufacturing companies. The interdependence between the success of process management and the success of supply chain management is the topic of the second part and is an introduction to the establishment and explanation of the initial research model on which the empirical research conducted, presented in the third part of the paper, is based.

¹ Scavarda, L. F., et al.: A business process management lifecycle framework for continuous improvement towards operational excellence: lessons learned from a longitudinal study in a Brazilian organisation. *International Journal of Lean Six Sigma*, 16(2) 2025, pp. 296-327.

² EFQM Foundation, <<https://efqm.org/>>, last accessed on 5/2/2026; FQCE Foundation, <<https://fqce.org.rs/>>, last accessed on 5/2/2026.

The fourth part of the paper is dedicated to the statistical analyses conducted, the results of which are the basis for accepting/rejecting the initial research hypotheses. The limitations of the conducted research and the directions of future research in this area are the topic of the fifth part. The last, sixth part refers to the conclusion of everything presented, with a review of the most important elements of the paper.

2. PROCESS MANAGEMENT AS A DETERMINANT OF THE EFFECTIVENESS AND EFFICIENCY OF MANUFACTURING COMPANIES

Process management in manufacturing companies encompasses planning, organizing, and controlling activities aimed at achieving performance targets.³ The success of process management directly determines the productivity and efficiency of all processes in manufacturing companies, and therefore the success of achieving company-level goals as a whole.⁴ Process management activities directly arise from the orientation of manufacturing companies towards processes, customers, and employees (in accordance with the principles of EFQM and FQCE Foundations). Many authors observe the impact of these activities on the performance of manufacturing companies (with a special focus on effectiveness and efficiency) through the impact of organizational integration dimensions on qualitative indicators of business performance, whereby qualitative indicators of business performance are equated with key determinants of achieving the level of business performance^{5, 6, 7, 8, 9}. Therefore,

³ Dumas, M., et al.: *Fundamentals of business process management*, Cham: Springer-Verlag, 2018.

⁴ Kasim, T., Haracic, M., Haracic, M.: The improvement of business efficiency through business process management. *Economic Review: Journal of Economics and Business*, 16(1) 2018, pp. 31-43.

⁵ Ettlie, J. E., Reza, E. M.: Organizational integration and process innovation. *Academy of Management Journal*, 35(4) 1992, pp. 795-827.

⁶ Yang, C. C.: Development of an integrated model of a business excellence system. *Total Quality Management*, 20(9) 2009, pp. 931-944.

⁷ Teixeira, R., Koufteros, X., Peng, X. D.: Organizational structure, integration, and manufacturing performance: A conceptual model and propositions. *Journal of Operations and Supply Chain Management*, 5(1) 2012, pp. 70-81.

⁸ Kirchmer, M.: Management of process excellence, in: vom Brocke, J., Rosemann, M. (eds): *Handbook on Business Process Management 2: Strategic Alignment, Governance, People and Culture*, Berlin, Heidelberg: Springer Berlin, 2014, pp. 79-99.

⁹ Ferdowsian, M. C.: Total business excellence—a new management model for operationalizing excellence. *International Journal of Quality & Reliability Management*, 33(7) 2016, pp. 942-984.

the authors emphasize that 1) internal integration (with special emphasis on the integration of the Procurement, Production and Sales processes), 2) integration with suppliers (a determinant of the interdependence of the previously listed processes) and 3) integration with customers (the ultimate indicator of the success of the interdependence of the target performances of the previously listed processes) are the most important indicators of the impact of management of key processes on generating efficiency and effectiveness of business.

The topic of the impact of process management on business efficiency and effectiveness is also widely discussed in the literature dealing with the impact of organizational design on business efficiency and effectiveness, with the authors emphasizing the existence of a strong interdependence between organizational structure - dimensions of organizational integration (with special emphasis on the management of the Procurement, Production and Sales processes) - achieving a level of business excellence^{10, 11, 12}. It has been proven that there are clearly defined characteristics of the organizational structure that stimulate the positive impact of the management of the Procurement, Production and Sales processes on generating efficient and effective business operations of manufacturing companies^{13, 14, 15}: 1) medium level of horizontal and low vertical specialization, 2) medium level of horizontal and vertical centralization, 3) combination of coordination and control mechanisms and 4) formalization based on compliance with the requirements of the Quality Management System and ISO 9001 standards. The business practice of business excellence manufacturing companies, winners of EFQM and FQCE awards in the field of business excellence, also highlighted the same specific features of the organizational structure, with an additional note of their importance for generating maximum effects of interdependence between the realization of target performance of management processes, and the realization of target performance of the company as a whole.

¹⁰ Miles, R. E., et al.: Organizational Strategy, Structure, and Process. *The Academy of Management Review*, 3(3) 1978, pp. 546-562.

¹¹ Bauer, J., Falshaw, R., Oakland, J. S.: Implementing business excellence. *Total Quality Management & Business Excellence*, 16(4) 2005, pp. 543-553.

¹² Anser, M. K., et al.: Strategic business performance through network capability and structural flexibility. *Management Decision*, 59(2) 2021, pp. 426-445.

¹³ Roth, A. V., Miller, J. G.: Success factors in manufacturing. *Business Horizons*, 35(4) 1992, pp. 73-81.

¹⁴ Meijaard, J., Brand, M. J., Mosselman, M.: Organizational structure and performance in Dutch small firms. *Small Business Economics*, 25(1) 2005, pp. 83-96.

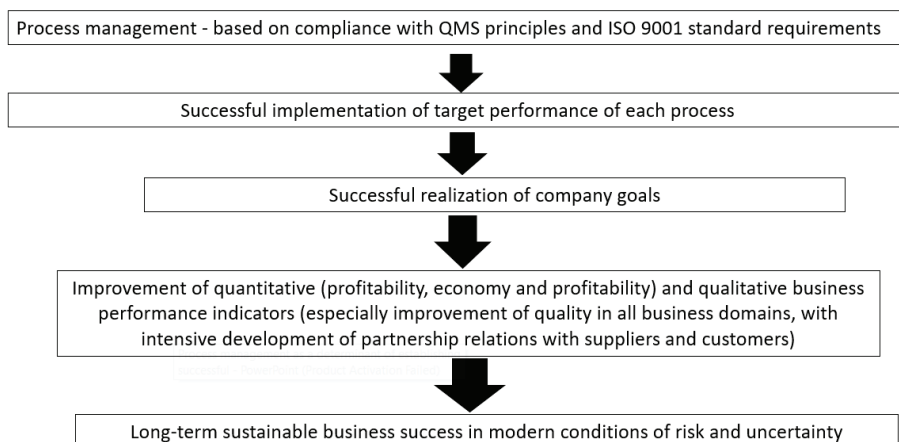
¹⁵ David, A. D., et al.: Effect of Organizational Structure on Employees' Productivity in Dangote Sugar Company. *International Journal of Multidisciplinary Research (IJMOR)*, 4(3) 2025, pp. 102-108.

Therefore, relevant literature and business practice of commercially successful manufacturing companies prove a strong interdependence between process management (with a focus on the Procurement, Production, and Sales processes), business efficiency and effectiveness, with the success of process management intertwining with the dimensions of organizational integration in the following way:

- *Supplier Integration* – reflects the success of *Procurement process management*, which is directly linked to the success of manufacturing companies in building long-term partner relationships with suppliers. This dimension of organizational integration directly, through Procurement process management, influences the success of Production process management and Sales process management, because the timely delivery of quality raw materials under favorable commercial conditions directly determines the success in achieving the target performance of these processes.
- *Internal integration* – reflects the degree of internal synchronization of processes in the company and the degree of cooperation between organizational parts of the company. Relevant literature and practice of business-efficient manufacturing companies prioritize the *integration of organizational units, Procurement, Production, and Sales*, with special emphasis on the connection of target performances of these processes.
- *Customer Integration* – the level of customer integration reflects the success of manufacturing companies in generating customer satisfaction and loyalty, key determinants of all *Sales process management* performance targets. Loyal customers are the greatest asset of every manufacturing company in today's high-risk and uncertain global environment.

Business excellence manufacturing companies (EFQM and FQCE award winners) recognize the importance of key process management (Procurement, Production, and Sales), including their intertwining with organizational integration dimensions, for generating long-term sustainable business success in the current geopolitical environment and global recession (Figure 1). These companies pay great attention (in accordance with the requirements of the QMS and the ISO 9001 standard) to identifying, evaluating, and defining measures to treat risks that potentially jeopardize the realization of the target performance of key processes. Therefore, risk management (especially the risk register) plays an important role in generating positive effects on the relationship between key process management and business effectiveness and efficiency. This interdependence also spills over to generating efficient and effective supply chain management, which is discussed in more detail in the next part of the paper.

Figure 1. Process management as a determinant of the effectiveness and efficiency of manufacturing companies



Source: authors

2. INTERDEPENDENCE IN THE RELATIONSHIP BETWEEN PM AND SCM IN THE MANUFACTURING SECTOR OF THE ECONOMY

Relevant literature and practice of business-leading manufacturing companies emphasize that establishing efficient and effective supply chain management is one of the key factors in achieving the level of business excellence. The success of this management domain is measured by the success of manufacturing companies in achieving the goal of timely delivery of quality products/ semi-finished products to satisfied customers at acceptable costs. Numerous authors emphasize that building long-term partnerships with suppliers and customers is a key predictor of achieving this goal. Kanji & Wong, Rashid & Haris Aslam, Hemsworth and Martinez-Costa et al. further substantiate this claim by the fact that establishing efficient and effective supply chain management is the ultimate goal towards which 1) quality management system, 2) internal integration through information system, 3) management of relationships with customers, suppliers and employees and 4) risk management are direct-

ed.^{16, 17, 18, 19} The EFQM and FQCE foundations agree with the conclusions presented by previously listed authors, emphasizing that the positive direction of the interdependence as mentioned above is the main characteristic of business excellence in manufacturing companies.

The impact of process management on the success of supply chain management has been a frequent topic of research for years. Mentzer et al. pointed out that defining supply chain management directly overlaps with defining process management because supply chain processes are key processes in a company, with special reference to the processes of Procurement, Production, and Sales.²⁰ Power believes that the success of process management is a necessary precursor to establishing successful integration and implementation of supply chain management in all sectors of the economy, including the manufacturing sector.²¹ Dias and Ierapetritou confirm this conclusion, with the additional note that planning, organizing, and controlling all processes in a company is important for generating target process management performances.²² The interdependence between process management success and supply chain management success has been particularly evident during the impact of the COVID-19 pandemic on business operations worldwide.²³ The practice of business-performing companies (award winners) has proven the conclusions of Teixeira, Koufteros, and Peng that improving the dimensions of organizational

¹⁶ Kanji, G. K., Wong, A.: Business excellence model for supply chain management. *Total quality management*, 10(8) 1999, pp. 1147-1168.

¹⁷ Rashid, K., Haris Aslam, M. M.: Business excellence through total supply chain quality management. *Asian Journal on Quality*, 13(3) 2012, pp. 309-324.

¹⁸ Hemsworth, D.: An empirical assessment of the EFQM excellence model in purchasing. *The International Business & Economics Research Journal (Online)*, 15(4) 2016, pp. 127-146.

¹⁹ Martinez-Costa, M., Jimenez-Jimenez, D., Martinez-Lorente, A. R.: EFQM model, green supply chain management and eco-innovation: an exploratory analysis. *Measuring Business Excellence*, 29(3) 2025, pp. 656-674.

²⁰ Mentzer, J. T., et al.: Defining supply chain management. *Journal of Business Logistics*, 22(2) 2001, pp. 1-25.

²¹ Power, D.: Supply chain management integration and implementation: a literature review. *Supply chain management: an International journal*, 10(4) 2005, pp. 252-263.

²² Dias, L. S., Ierapetritou, M. G.: From process control to supply chain management: An overview of integrated decision-making strategies. *Computers & Chemical Engineering*, 106 2025, pp. 826-835.

²³ Duong, A. T. B., et al.: Risks and supply chain performance: globalization and COVID-19 perspectives. *International Journal of Productivity and Performance Management*, 72(7) 2023, pp. 1962-1986.

integration is a key link in the interdependence of these variables²⁴, i.e. that the success of process management is actually measured through the dimensions of organizational integration, and that this interdependence directly flows into the fulfillment of process management performance targets: cost efficiency, flexibility, quality, and delivery.

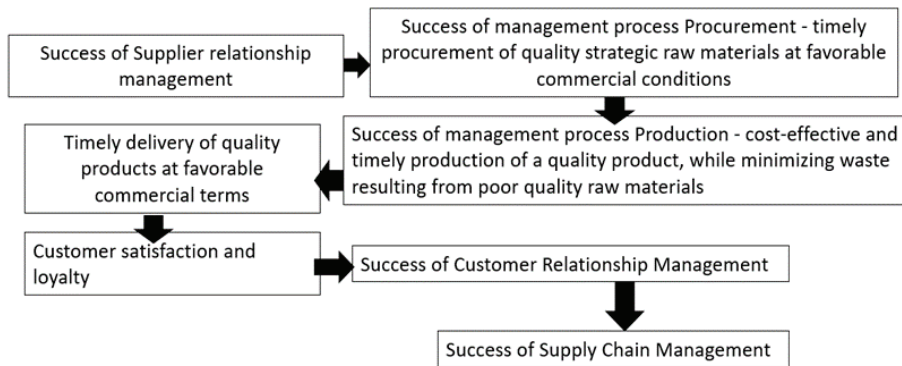
Teixeira, Koufteros, and Peng view process management through the dimensions of organizational integration because the success of process management requires the integration of all processes in the company, which directly leads to a strong connection between their target performances and therefore determines the success of achieving goals at the company level as a whole.²⁵ The EFQM and FQCE foundations emphasize that planning, organizing, and controlling all processes (as phases of process management) are aimed at the internal integration of all processes in the company, with integration with suppliers determining internal integration, and this interdependence spills over to integration with customers and their satisfaction through timely delivery of a quality product at favorable commercial conditions. Therefore, supplier relationship management, management of key processes (Purchasing, Production, and Sales), and customer relationship management are key determinants of establishing efficient and effective supply chain management (Figure 2), and the success of manufacturing companies in generating long-term sustainable business success depends on the aforementioned interdependence. Guided by the aforementioned interdependence, the statistical portal Statista conducted a study in 2017 to identify ways to improve the management of key processes in order to generate improvements in the realization of the target performance of supply chain management.²⁶ A focus on rapid identification and timely resolution of problems, along with the successful implementation of a risk register and SWOT analysis, emerged as key predictors of the positive impact of key process management on the dimensions of organizational integration, which spills over to all qualitative and quantitative indicators of business performance of manufacturing companies, including supply chain management performance.

²⁴ Teixeira, R., Koufteros, X., Peng, X. D.: Organizational structure, integration, and manufacturing performance: A conceptual model and propositions. *Journal of Operations and Supply Chain Management*, 5(1) 2012, pp. 70-81.

²⁵ Teixeira, R., Koufteros, X., Peng, X. D.: Organizational structure, integration, and manufacturing performance: A conceptual model and propositions. *Journal of Operations and Supply Chain Management*, 5(1) 2012, pp. 70-81.

²⁶ Statista Portal: Report: *Implementation of practices within the supply chain in 2017*, 2017.

Figure 2. Interdependence in the relationship between PM and SCM



Source: Authors

The interdependence shown in Figure 2 overlaps with the influence of organizational design dimensions (supplier integration, internal integration, and customer integration) on supply chain management performance, which served to formulate the initial research model in the conducted empirical research. In short, the relevant theory and practice of commercially successful manufacturing companies have proven a strong interdependence in the relationship between the organizational integration dimension as a determinant of process management success - supply chain management success - achieving the level of business excellence, and the aforementioned interdependence is verified on the example of the manufacturing industrial sector of the Republic of Serbia in the following parts of the paper.

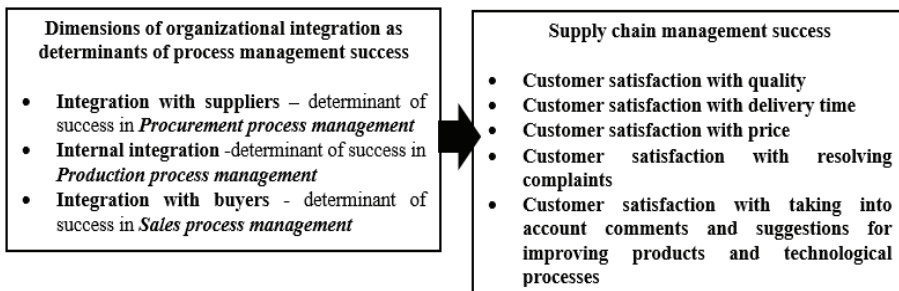
3. RESEARCH METHODOLOGY

An empirical study was conducted using the survey method during the period July-October 2025 on a sample of 113 manufacturing companies in the Republic of Serbia (the sample size meets the requirement of statistical relevance). The survey was completed by two representatives of each company to generate relative objectivity in the responses. The focus, when collecting data, was on representatives of top management, operational management, and employees involved in the quality management system because these categories of employees, according to the experience of the EFQM and FQCE foundations, have proven to be complete experts in the given research variables.

The initial research model (Figure 3) was created based on the conclusions of the relevant literature for the analysis of the dimensions of organizational in-

tegration as a determinant of the success of key process management, but with a dominant respect for the criteria that the EFQM and FQCE foundations take into account when conducting competitions for awarding awards in the field of business excellence. These are criteria that take into account the requirements of the quality management system, the requirements of the ISO 9001 standard, and the EFQM/FQCE business excellence models (which overlap in almost all points). The dimensions of organizational integration, as determinants of process management success, have the status of independent variables, while the indicators of supply chain management success have the status of dependent variables. When it comes to dependent variables, the success of supply chain management is reduced to the bottom line of validation of success in realizing the target performance of “timely delivery of a quality product to customers at an agreed place and at acceptable costs” - customer satisfaction with each of the determinants of business cooperation that permeate this target performance. All manufacturing companies, operating in accordance with the requirements of QMS and ISO 9001 standards, analyze all of the customer satisfaction predictors (listed in Figure 3) at least once a year (data is collected using a survey method), and it is precisely these analyses that form the basis for providing answers to the success in realizing the key goal of supply chain management. Customer satisfaction reflects not only the success of customer relationship management (Sales process management), but also the success in synchronizing the management of the Procurement process (determined by integration with suppliers) and the management of the Production process (determined by internal integration). Each of the variables was measured through statements (formulated predominantly using questions for the implementation of the EFQM and FQCE competitions), with the respondents expressing their level of agreement with the statements through a five-point Likert scale, where 1 means “I absolutely disagree with the statement”, and 5 means “I absolutely agree”.

Figure 3. Initial Research Model



Source: authors

In parallel with the initial research model, using a qualitative research methodology based on a parallel analysis of relevant literature and the EFQM/FQCE competition, the following initial research hypotheses were formulated:

H1: Integration with suppliers, as a determinant of the success of management through the Procurement process, determines the success of supply chain management.

H2: Internal integration, as a determinant of the success of management through the Production process, influences the success of supply chain management.

H3: Integration with customers, as a determinant of the success of management through the Sales process, determines the success of supply chain management.

H4: Dimensions of organizational integration, as determinants of the success of management through key processes, statistically significantly determine the success of supply chain management.

4. STATISTICAL ANALYSES

The collected data were summarized in an Excel table that was imported into IBM SPSS statistical software to conduct appropriate statistical analyses: 1) descriptive statistical analysis - to assess the specificity of the sample of surveyed manufacturing companies, 2) reliability analysis of measurement scales - to assess the reliability of the statements that measured the research variables, which correspond to the questions in the questionnaire, 3) correlation statistical analysis - to assess the relationships between all variables that are the subject of the research and 4) regression statistical analysis - to assess the impact that the dimensions of organizational integration, as determinants of process management success, have on the success of supply chain management, with the identification of the dimension with the greatest impact. Before conducting statistical analyses, the sample structure was reviewed:

- The share of large companies is 48%.
- The share of small and medium-sized companies is 52%.
- Companies that have been operating for more than 20 years dominate - 79%.
- The survey covered companies operating in all parts of Serbia: Belgrade (26%), Vojvodina (12%), Western Serbia (17%), Eastern Serbia (13%), Central Serbia (18%), and Southern Serbia (14%).
- The survey covered all segments of the manufacturing economy, with companies that produce semi-finished products (which other companies use as inputs for production) and produce spare parts for machines dominating.

4.1. DESCRIPTIVE STATISTICAL ANALYSIS AND RELIABILITY OF MEASUREMENT SCALES

First, descriptive statistical analysis was conducted on the entire sample with the aim of examining the homogeneity of respondents' attitudes regarding the statements that measured each of the research variables. Descriptive statistics provide the possibility of drawing general conclusions about the specificities of organizational design dimensions and the success of supply chain management in the manufacturing industrial sector in the Republic of Serbia.

Table 1. Descriptive analysis: dimensions of organizational integration as determinants of success of process management (n=113)

VARIABLE	STATEMENT	MEAN
Integration with suppliers	Suppliers contribute to product quality through the quality of raw materials.	4.35
	Partnerships with suppliers are based on the quick and efficient resolution of all problems in business cooperation.	4.63
	Timely procurement of quality raw materials at favorable commercial terms is a hallmark of cooperation with key raw material suppliers.	4.27
Internal integration	There is intensive communication between Procurement, Production, and Sales as organizational parts of the manufacturing company.	4.37
	Teamwork between the organizational units, Procurement-Production-Sales, is a hallmark of successful management of the Production process in a particular company.	4.11
	Partnerships with suppliers minimize the risks of managing the production process, which translates into the success of partnership relationships with customers of a particular company.	4.46
Integration with customers	Building long-term partnerships with customers is one of the key business goals of a particular company.	4.66
	The company strives to resolve all customer complaints quickly and efficiently.	4.52
	The company respects and implements customer comments and suggestions regarding the improvement of the quality of technological processes and/or products.	4.43

Source: author's calculation

Tables 1 and 2 show the mean values of the respondents' attitudes for all statements that measured the research variables. The standard deviations for each statement ranged from 0.94 to 1.22, which indicates the relative homogeneity of the respondents' attitudes.

Table 2. Descriptive analysis: success of supply chain management (n=113)

VARIABLE	STATEMENT	MEAN
Success of Supply Chain Management	Customers are satisfied with the quality of semi-finished products/products.	4.49
	Customers are satisfied with the adherence to the agreed delivery deadline.	4.25
	Customers are satisfied with the price-quality ratio of semi-finished products/products.	4.56
	Customers are satisfied with the speed and efficiency of resolving complaints.	4.34
	Customers are satisfied with the degree of their involvement in improving technological processes and/or products.	4.11

Source: author's calculation

Table 1 indicates that manufacturing companies in Serbia pay great attention to establishing efficient and effective management of the Procurement, Production and Sales processes, with management being aware of the importance of establishing and developing long-term partnership relationships with suppliers and customers, as well as stimulating teamwork within the company, for generating this goal (high arithmetic means, interval 4.11-4.66, for each statement). Table 2 depicts the success of the surveyed manufacturing companies in establishing efficient and effective supply chain management, measured by the success of achieving the target performance "timely delivery of quality products to customers under favorable commercial conditions", taking into account the position of the EFQM and FQCE foundations that customer involvement in production and technological improvements is important for generating this goal. The arithmetic mean values show that Serbian manufacturing companies successfully meet customer expectations regarding all determinants of supply chain management success (range of arithmetic means 4.11-4.56). Descriptive statistics also indicate that there is room for improvement (at least the arithmetic mean according to the findings), both in the domain of organizational integration dimensions (as a determinant of key process management success), and in the domain of customer satisfaction predictors (as a determinant of supply chain management success):

- *Improving teamwork in the Procurement, Production, and Sales Departments* to minimize all risks that are identified and evaluated in these processes (arithmetic mean 4.11) - this improvement directly leads to an increase in the probability of improvement, both in the target performance of each process and in the target performance at the company level as a whole.
- *Improving customer satisfaction through the speed and efficiency of resolving complaints* (a determinant of supply chain management success with a process score of 4.11) is a direct consequence of teamwork among the Procurement, Production, and Sales Departments in the company. This teamwork covers all types of complaints - complaints about poor product quality (poor quality of raw materials or a problem in one of the stages of the production process), complaints in the field of respecting delivery deadlines (synchronization in the relationship between the timeliness of raw material procurement - timeliness of production - timeliness of shipment - timeliness of unloading), complaints about the selling price (directly determined by the cost price, which depends on the cost efficiency in all processes in the company), etc.

After descriptive statistical analysis, and before correlation, *the reliability of the measurement scales was checked using Cronbach's alpha coefficients* for each of the variables, which proved that the statistical requirement in the domain of internal consistency within the scale was not violated (Nunnally's (1978) recommendation²⁷ was used that the statistically desirable value of the coefficient is above 0.7):

- *Integration with suppliers as a determinant of the success of the Procurement process management* - the number of questions that make up the scale is 3, the value of Cronbach's alpha coefficient belongs to the range of 0.8-0.9, which is considered *good internal consistency within the scale*.
- *Internal integration as a determinant of the success of the Production process management* - the number of questions that make up the scale is 3, the value of Cronbach's alpha coefficient belongs to the range of 0.8-0.9, which is considered *good internal consistency within the scale*.
- *Integration with customers as a determinant of the success of the Procurement process management* - the number of questions that make up the scale is 3, the value of Cronbach's alpha coefficient is over 0.90, which is considered *excellent internal consistency within the scale*.

²⁷ Nunnally, J. C.: *Psychometric theory*, 2nd edition, New York: McGraw-Hill, 1978.

- *Determinants of supply chain management success* - the number of questions that make up the scale is 5, the value of Cronbach's alpha coefficient is over 0,0, which is considered *excellent internal consistency within the scale*.

4.2. CORRELATION STATISTICAL ANALYSIS

Correlational statistical analysis aims to identify the type and strength of relationships that exist between all variables in a specific research model. Table 3 presents the results of correlational statistical analysis for the variables supplier integration, internal integration, customer integration, and determinants of supply chain management (SCM) success. All correlations can be considered statistically significant with a margin of error of 0,01 ($p \leq 0.01$).

Table 3. Results of the correlational analysis (n=113)

	Integration with suppliers	Internal integration	Integration with customers	Determinants of SCM success
Integration with suppliers	1	0.918**	0.928**	0.917**
Internal integration	0.918**	1	0.882**	0.991**
Integration with customers	0.928**	0.882**	1	0.882**
Determinants of SCM success	0.917**	0.991**	0.882**	1

** statistically significant correlations $p \leq 0.01$

Source: author's calculation

The results of the correlation statistical analysis proved that the relationships between all research variables are direct, positive, and statistically significant. The identified correlations are considered very strong correlations ($r > 0.05$), with the strongest correlation being that between internal integration and determinants of supply chain management success ($r = 0.991$). When it comes to the relationship between the dimensions of organizational integration, as determinants of key process management success, the strongest relationship was identified between integration with suppliers and integration with customers ($r = 0.928$). The correlation between internal integration and integration with customers is also strong ($r=0.882$), but it is somewhat weaker than the previously explained correlation.

It can be concluded that the results of the correlation analysis, after analyzing the reliability of the measurement scales, have proven the justification of the initial research model and the conclusions of the relevant literature and the practice of business excellence manufacturing companies about the high degree of influence of independent variables (organizational integration dimensions) on the dependent variable (success of supply chain management). This influence will be explained in more detail in the next step, by implementing regression analysis, where, in addition to the statistical significance of the influence, the dimension of organizational design (process management) with the greatest influence on the establishment of efficient and effective supply chain management in the manufacturing sector of the Republic of Serbia will be identified.

4.3. REGRESSION STATISTICAL ANALYSIS

The goal of the regression analysis is to identify the statistical significance of the impact of each of the dimensions of organizational integration, as a determinant of process management success, on the determinants of supply chain management (SCM) success. Thus, in the regression analysis, supplier integration (IS), internal integration (II), and customer integration (IC) have the status of independent variables, and the determinants of supply chain management success (summarized predictors of customer satisfaction with determinants of success in establishing efficient and effective SCM) have the status of dependent variables. The principle of multicollinearity is not violated ($VIF < 10$), and the model is statistically significant ($p \leq 0.01$) and explains 95.4% of the variance of the dependent variable.

Table 4. Regression statistical analysis – success of SCM as dependent variable

	Unstandardized coeff.	Standardized coeff.		Sig.
	B	Std. error	Beta	
Integration with suppliers	1.069	0.041	0.972	0.000**
Internal integration	0.171	0.048	0.241	0.000**
Integration with customers	0.314	0.085	-0.292	0.000**

Source: author's calculation

The results of the regression statistical analysis (Table 4) have upgraded the results of the correlation analysis and have crystallized the statistically significant influence of each of the dimensions of organizational design on the deter-

minants of supply chain management success. Synchronization and realization of target performance of the Procurement, Production, and Sales processes (determined by a strong connection of integration with suppliers, internal integration, and integration with customers) statistically significantly determine all predictors of customer satisfaction with the determinants of establishing efficient and effective supply chain management in the manufacturing industrial sector.

4.4. CONSOLIDATED DISCUSSION OF THE RESULTS OF STATISTICAL ANALYSES

The statistical analyses have proven the validity of the initial research model. It explains over 95% of the variance of SCM success as a dependent variable, which directly influences the drawing of reliable conclusions regarding each of the initial research hypotheses.

H1 is accepted: Integration with suppliers, as a determinant of the success of management through the Procurement process, determines the success of supply chain management.

H2 is accepted: Internal integration, as a determinant of the success of management through the Production process, influences the success of supply chain management.

H3 is accepted: Integration with customers, as a determinant of the success of management through the Sales process, determines the success of supply chain management.

H4 is accepted: Dimensions of organizational integration, as determinants of the success of management through key processes, statistically significantly determine the success of supply chain management.

Correlation and regression analyses have shown that integration with suppliers, based on partnership relationships, is a key driver for achieving target performance in the Procurement and Production management processes, which is reflected in the Sales management process, and therefore in the entire supply chain. Continuous work on improving partnership relationships with suppliers is an important predictor of generating timely deliveries of quality raw materials at favorable commercial terms. Many manufacturing companies conduct a two-way analysis of satisfaction with business cooperation at least once a year (their satisfaction with cooperation with suppliers and the suppliers' satisfaction with cooperation with specific companies) to identify and take measures for improvements in this area. Developed partnership relationships with strategic suppliers are one of the key goals of the Procurement process

management, and it spills over into the Production process management because by generating this goal: 1) there will be no production downtime due to delays in raw materials and the costs that these production downtimes cause, 2) good quality raw materials will not lead to increased waste (in relation to the prescribed norms), which also leads to cost efficiency and 3) points 1 and 2 directly lead to respecting production deadlines and the agreed delivery date to customers. The interdependence between the Procurement process management and the Production process management spills over into the success of the Sales process management, which is measured by the level of customer satisfaction and loyalty. Customer satisfaction with key determinants of business cooperation (quality, delivery deadlines, commercial conditions, complaint resolution, staff cooperation, etc.) is not only a mirror of the success of the Sales process management, but also creates a picture of the success of the management of the entire supply chain. The manufacturing industry sector of the Republic of Serbia has proven that key process management, together with supplier relationship management and customer relationship management, determines the establishment of an efficient and effective supply chain. For years, the EFQM and FQCE foundations, while promoting their business excellence models, have emphasized the importance of synchronizing the management of the Procurement, Production, and Sales processes for the realization of SCM performance targets, which translates into success in realizing the goals of the manufacturing company as a whole. The research has proven that the correct attitude of business-performing manufacturing companies is that there is a statistically significant and strong connection between success in realizing key process performance targets, and that it is the dimensions of organizational integration that positively “push” this interdependence towards the establishment of efficient and effective supply chain management, which results in generating customer satisfaction and loyalty. Satisfied and loyal customers are the greatest asset of manufacturing companies in modern conditions of high risk and uncertainty, both within the country and internationally.

Descriptive statistical analysis has shown that there is always room for improvement, especially in the domain of teamwork of organizational parts of the company (and therefore synchronization of process management), with each improvement directly leading to generating a higher level of customer satisfaction with SCM solutions, including the speed and efficiency of complaint resolution, which was rated the lowest by the surveyed manufacturing companies in the Republic of Serbia.

5. THEORETICAL/PRACTICAL IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH DIRECTIONS

The theoretical and practical contribution of the paper is reflected in the creation of empirically supported evidence that the synchronization of key process management in manufacturing companies is one of the most important predictors of establishing efficient and effective supply chain management in this sector of the economy. This research topic is rarely discussed in the domestic literature, so it can be concluded that the paper also contributes to overcoming the research gap in this domain. An important theoretical contribution of the paper is also reflected in the detailed analysis of the dimensions of organizational integration as determinants of the success of key process management, as well as the impact of this interdependence on customer satisfaction with all determinants of supply chain management success. In this way, the impact of the synchronization of the Procurement, Production, and Sales processes on the success of supply chain management is covered in detail, as evidenced by the very high degree of explanation of the variance of the dependent variable in the initial research model. The research provides specific guidelines to the management of manufacturing companies on what needs to be corrected and improved to achieve a more positive impact of key process management on supply chain management performance: improving teamwork of the company's organizational parts as an important predictor of generating improved customer satisfaction by the speed and efficiency of resolving complaints (the lowest rated predictor of satisfaction with the determinants of SCM success).

The limitation of the research concerns the method of data collection, i.e., filling out the questionnaire by only two representatives of each manufacturing company in the Republic of Serbia. The survey took a long time, and it was a great challenge to get answers from at least two representatives, with the answers in a large number of cases being very similar, which affects their objectivity. The reliability of the measurement scales and the percentage of variance explained by the dependent variable confirm the statistical significance of the research, but for potential statistical improvements in the future, the sample should be expanded to a minimum of five respondents per company because, according to the researchers' experience, it has been shown that this way, the risk of subjectivity is minimized.

6. CONCLUSION

Process management is one of the most important determinants of establishing efficient and effective supply chain management, which translates into achieving the level of business excellence and long-term sustainable business success

of manufacturing companies. There is a strong synchronization of success in the realization of target performance management processes, Procurement, Production, and Sales, which, determined by the dimensions of organizational integration, directly affects the realization of the goals of the manufacturing company as a whole.

Integration with suppliers, internal integration, and integration with customers determine the success of process management, supplier relationship management, and customer relationship management, which, ultimately, determine the success of supply chain management, measured by generating customer satisfaction and loyalty. Satisfied and loyal customers are the greatest wealth of manufacturing companies in the current conditions of high risk and uncertainty in the global framework.

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