

Streszczenie w języku angielskim – Synopsis

**CZĘSTOCHOWA UNIVERISTY OF
TECHNOLOGY
MANAGEMENT FACULTY**

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**Advanced information technologies in process
management of manufacturing companies in the Silesia
region**

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Socio-economic development determines the increase in consumers' awareness of the possibilities of purchasing different products and the ways of using them. In this sense, companies are forced to act to remodel their existing management methods and implement the processes taking account of the existing demand. Moreover, the changes in the customers' attitudes determine the necessity of establishing relations at each stage of the product use, starting from the decision to purchase specific products through distribution processes to after-sales service.

Availability of a considerable amount of data and information results from dynamic changes taking place in the organization's environment. It requires the decision-makers in enterprises to continually increase the scope of their investment projects, regarding, among other things, the use of tools enabling the acquisition of critical data and information, their processing into practical knowledge resources and collection in databases and data warehouses. In turn, progressive consumer awareness and competitiveness of business entities determine the fundamental role of intangible resources in the entity's subsequent development. The IT base modernization conditions the possibility of integrating individual, organizational structures by improving the transfer of collected knowledge resources. Moreover, the implementation of highly advanced information tools (analytical tools, expert systems, enterprise resource planning¹ systems) improves the course of processes through the data and information available in real time. That allows shortening the time needed for employees to perform individual operations and, thus, the waiting time for finished products by a specific group of customers. Therefore, the broadly understood reorganization of the existing management methods should be focused on the full use of available intellectual capital, purchase or rental from a company with a similar production branch of machinery and equipment with the possibility of quick modification of the production system to implement a short, one-time production operation, and the pursuit of companies to produce fewer template products, corresponding to the requirements of a personalized group of customers^{2,3,4}.

The application of modern solutions, information, IT, and production technologies influences the implementation of the expectations of customers who are interested in

¹ ERP –Enterprise Resource Planning.

² J. Kisielnicki, *Technologia informacyjna w organizacji, Zarządzanie Zasobami Ludzkimi*, 2006, No 3-4, p. 10.

³ J. Baruk, *Innowacyjność przedsiębiorstw w państwach Unii Europejskiej*, *Wiadomości Statystyczne*, 2016, No. 8, p. 64.

⁴ J. Markiewicz, *Nowa rola klienta w procesie tworzenia wartości*, *Acta Universitatis Nicolai Copernici Zarządzanie* 2014, vol. 42, pp. 153-159.

- Variable and various sets of data (Big Data),
- mobile technologies.

In order to ensure the appropriate level of knowledge resources and the ability to manage the acquired data and information in Polish enterprises, it is necessary to determine the relationships contained in the following research problems of this dissertation:

P.1: *What factors determine decisions related to the implementation of highly advanced information technologies in Polish manufacturing companies and what is the degree of their mutual correlation?*

P.2: *To what extent does the introduction of changes in the existing ways of managing production enterprises through the implementation of advanced information technologies increase the data and information transfer in these business entities?*

P.3: *What types of information technologies are characterized by the highest level of implementation in Polish production companies and to what extent do they determine the increase of their innovativeness and the achievement of objectives set out in a long-term development strategy?*

Defining the research problems significantly contributed to indicating the existing research gaps and setting the **main objective** of this Ph.D. thesis, which boils down to:

Determining the significance and impact of the implementation of process management forms through highly advanced information technologies in manufacturing companies operating in the Silesian Province.

When it comes to the main objective and the possibility of its full verification, the specific objectives of this dissertation have been determined: cognitive, empirical, and project ones.

The cognitive objective - C1 - characterization of production enterprises in terms of their capability of applying highly advanced information technologies.

The empirical objective - C2 - identification of information technologies with the highest level of implementation in individual areas of production enterprises and analysis of the impact of applied solutions in the functioning of this group of business entities.

The project objective - C3 - development of a conceptual model of process management based on selected information technologies.

The realization of the main and specific objectives of this Ph.D. thesis will be carried out with the defined research problems taken into consideration and basis on the adopted main hypothesis, which assumes that:

dissertation paper is supplemented by the bibliographic part, the list of drawings, and the list of tables. Besides, its integral elements are four annexes: two applied survey questionnaires, the created conceptual model of process management, and the confirmation of implementing the developed model in the production company.

The first chapter describes the concept of process management. The availability of data collected in the resources of domestic and foreign literature allowed indicating the role and importance of products in creating competitiveness of business entities. Moreover, the notion of production companies was presented and their influence on the activity and development of individual branches of industry was assessed.

The second chapter focuses on the validity of the implementation of highly advanced information technologies in manufacturing companies and their importance in the process of increasing knowledge resources. Its crucial element is also the characteristics of available information technologies. Moreover, the scope and level of using advanced information technologies in the aspect of process management of manufacturing companies were indicated. The analysis of available literature sources also allowed to determine the relationship between the functioning of the organization based on the process approach to management, implementation of individual information technologies, and the possibility of achieving the main strategic objectives.

The third chapter was developed based on own research. It presents a description of the research sample, which consisted of randomly selected production companies operating in the Silesian Voivodeship and selected respondents (company owners and employees). Furthermore, the subject matter of the third chapter oscillates around the specification of conditions and determinants of applying information technologies in process organizations and the identification of areas with the highest-level implementation of such solutions.

The fourth chapter contains the characteristics of the Industry 4.0 concept and the definition of the meaning of individual technologies in process management of Polish manufacturing companies. Its subject matter is focused on analysing the research results obtained (in the second part of the survey), and thus the assessment of the impact of the use of information technologies on the organisations' management in the process aspect and the level of respondents' knowledge about Industry 4.0 and its role in increasing their innovation level.

The fifth chapter presents a conceptual model of process management, functioning based on selected information technologies and Industry 4.0 with the highest-level implementation in a separate research sample. It is believed that the application of the

model may significantly improve the organization's functioning due to the optimization of the processes. For this purpose, the process management model was verified in a selected production company.

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