

AN IMPROVEMENT OF INFORMATION PROCESSES IN ENTERPRISES – THE ANALYSIS OF SALES PROFITABILITY IN THE MANUFACTURING COMPANY USING ERP SYSTEMS

Kościelniak H.*

Abstract: Processes constitute an inseparable element of the technical, social or organizational system. Moreover, they show the dynamics of the organization and they are subordinated to its goals; they actuate the organizational reality and they enable the cause and effect analysis of the changes taking place in the organization and its constituent elements. The aim of the paper is the multidimensional assessment of management of sales profitability of manufacturing companies using ERP systems; in the paper there are presented the images (windows) - of the evaluation of the enterprise performance; their exemplification was given to the enterprise under research. The collected and ordered information satisfy the information needs of decision-makers at the level ensuring methodological rationality of the decision.

Key words: information processes, sales profitability, information technology

Information processes of enterprises and their development

On the grounds of praxeology, the process is a combination or a range of permutation events, running in time, which are recognized as a whole on account of specific highlighted features (Davenport, 1993). The highlighted whole consists of sequentially performed operations, mainly aiming at creating value for clients and stakeholders. As Brillman notices, processes are most frequently divided into two groups:

- operational (business processes), defined as central processes, with the help of which there is created the value for the client and other interested parties,
- auxiliary processes, creating the conditions for the development of operational processes; they have internal clients; they may be divided into support processes and management processes (Brillman, 2002).

Each enterprise ought to develop its own map of processes. The basic processes for the enterprise are the ones which are of critical importance for its success at a given time (Jelonek and Stępnia, 2013; Pachura, 2012). Their correct interpretation may be useful while establishing strategic development priorities (Hedstrom et al., 2011). In process enterprise, operational processes consist of six main types:

- understanding customer market,
- developing the vision and strategy,
- manufacturing products and services,
- marketing and sales – production and deliveries in state-owned and service enterprises, and

* **Prof. Helena Kościelniak**, Czestochowa University of Technology, Faculty of Management

✉corresponding author: helenak@zim.pcz.czest.pl

– invoicing and providing service to clients.

In process enterprise the management and support processes also include six types, such as:

- human resources management and staff development,
- information systems management,
- management of financial resources and assets,
- implementation of environmental programs,
- management of external relations, and
- management of development and changes.

Information systems management is developed by information technologies. In case of Information Technology we deal with a set of technologies, techniques, methods and tools for processing data, information, knowledge and communication and offering them on the world market. Moreover, processing data into knowledge is a continuous process and takes place in continuum, at which there are designated four stages: data, data processing, information and knowledge. Confronting the above stages with transaction costs (curve of transaction costs) allows to notice that marginal cost of creatively generated knowledge may be too high to reach other units of knowledge with current technological capabilities (see: Figure 1) (Kleas, 2000; Man et al., 2011).

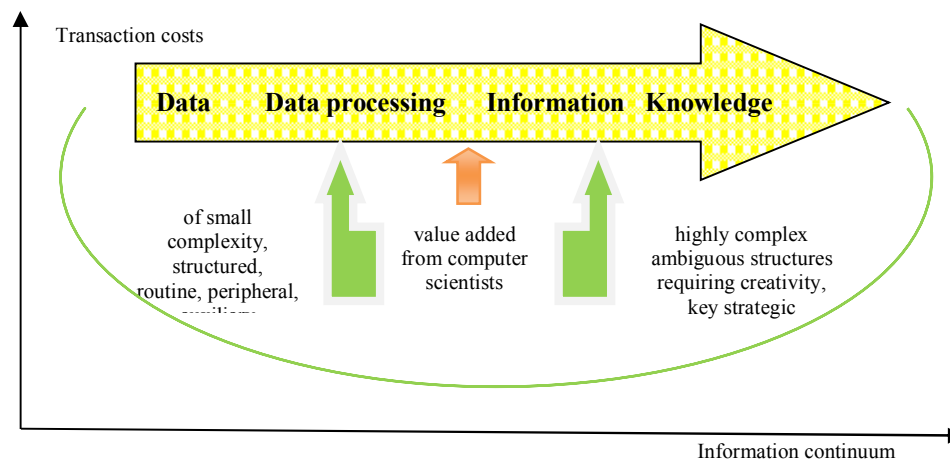


Figure 1. Information continuum and transaction costs (Chandra and Shankar, 2004)

The area of data processing is the oldest and most developed segment of Information Technology (Lis et al., 2005). In the most general assumptions, Information Technology covers the issues of acquiring data from different sources, their storage in internal and external memory and sharing them, in the requested form, with different classes of users (Detlor, 2010). The characteristic feature of Information Technology is the interdisciplinary nature of products, which is based on three scientific disciplines: economics, informatics and engineering and taking

over the integration functions to create new solutions for different applications in the enterprise, constructing the integrated multi-company information systems, solutions for communication, globalization or tools for supporting decisions (Tomski, 2006; Turek, 2011; Lis et al., 2014) and the desired flexibility and the content of strategies (Krupski et al., 2009; Nowicki et al., 2012).

One of the areas of data processing is management of financial resources and assets. It is the process which is critical for the organization, including the following five tasks:

- management of financial resources,
- organizing systems of financial transactions and accounting,
- conducting internal audit,
- management of fiscal (tax) duties (Powell, 2001).

In the group of the above tasks there is the issue of creating the profitability of the enterprise.

The assessment of the performance of the enterprise by sales profitability

The criteria for the evaluation of activities in enterprises are based on the examination of mutual relationships that occur between individual items in financial reports. Assessment of the criteria for the evaluation of activities in enterprises is recommended especially (Antonowicz, 2011; Vance, 2003) because:

- it allows for standardization of the analysis, which is of much importance to banks, where a customer should be offered the same terms in different banks when applying for a loan,
- it allows for definition of uniform goals in companies which manage multiple enterprises,
- it opens up opportunities for comparison with average ratios in the sector, a group of enterprises and between competitors at a particular time,
- it allows for assessment of tendencies and progression in consecutive years.

The following five groups of ratios are used for evaluation of individual domains of activities in the enterprise: financial liquidity, operational efficiency, structure of financing, profitability and ratios of the capital market.

One of the main dimensions of the assessment of the performance of the enterprise is profitability; profitability ratio, calculated appropriately, amounts to the relation of the profit calculated at different levels of business activity to:

- the achieved net income from sales,
- total assets,
- equity.

Profitability ratios include:

- return on sales (ROS),
- return on assets and investments,
- return on equity (Ross Stephen et al., 2007).

The analysis of sales profitability in the manufacturing company using ERP system

The manufacturing company deals with technology of manufacturing workpieces and it possesses seven manufacturing cells. In the enterprise there are employed 75 people who manufacture 34 workpieces of different kind. There takes place the implementation of the ERP (Enterprise Resource Planning) system. The assessment of effectiveness of manufacturing cells is based on orders: each of them has its own number. For each order there have been assigned revenues and expenses. In the group of expenses there have been identified direct and indirect costs. Direct costs are directly related to a given order and they include e.g. costs of materials, energy, remuneration or costs of outsourced services for a given order. In the group of indirect costs there have been included: costs of employee training, costs of quality control and the management, i.e. costs of departments from the headquarters providing services for the benefit of individual manufacturing cells. Indirect costs are allocated to individual orders by the time of their performance, which is recorded in the system by each employee.

Effectiveness of individual manufacturing cells is assessed by the level of sales profitability (return on sales was calculated as the relation of operating profit and value of income from net sales) in three dimensions:

- for individual manufacturing cells,
- for production of specific workpieces (services),
- for individual employees.

The ad hoc analysis of profitability in such cross-sections is not possible in any ERP system. For the examination of sales profitability for an individual order number there has been "inserted" information respectively for manufacturing cells, workpieces production and employees. In the enterprise under research in the first quarter of 2014 there were performed 890 orders. Newly implemented system allowed to identify seven images (windows) of the financial results of the enterprise activity:

Image 1: revenues, direct costs and delivery date of individual orders, including: list of orders (1-890), revenues for individual orders, direct costs for individual orders, delivery time of subsequent orders,

Image 2: structure of costs for subsequent orders, including: list of orders (1-890), revenues for subsequent orders, direct costs for individual orders, delivery time of subsequent orders, indirect costs,

Image 3: profitability of orders, including: list of orders (1-890), revenues for subsequent orders, direct costs for individual orders, delivery time of subsequent orders, indirect costs, operating profit, return on sales in %,

Image 4: order components, including: list of orders (1-890), manufacturing cells, type of service, employee, revenues for individual orders, direct costs for individual orders, delivery time of subsequent orders, indirect costs, operating profit, return on sales in %,

Image 5: profitability of manufacturing cells, including: manufacturing cells (7), revenues, total costs, operating profit, return on sales in %,

Image 6: profitability of individual workpieces (34), including: list of workpieces (services), revenues, total costs, operating profit, return on sales in %,

Image 7: profitability of individual employees, including: list of employees (75 people), revenues, total costs, operating profit, return on sales in %.

The performance of the enterprise under research is presented in Figures 2 a, b, c.

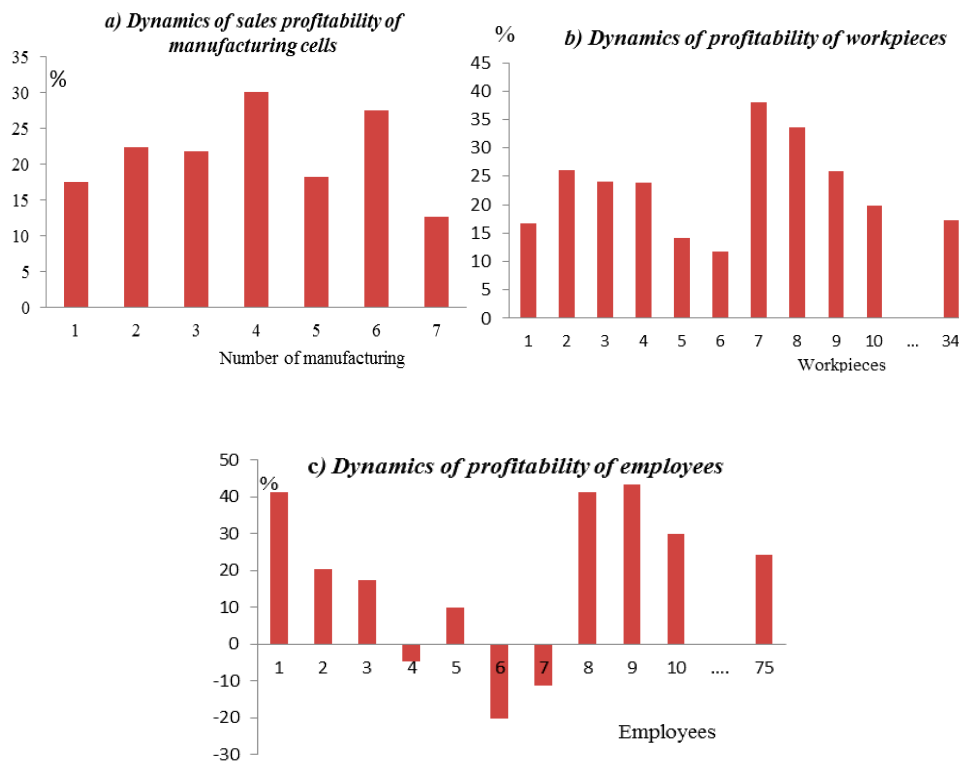


Figure 2. The level of profitability of the manufacturing company in the first quarter of 2014

By specifying the key of settlement of orders, the management receive synthetic information on the profitability of the activity run in individual areas; they obtain the image of profitability of individual orders, manufacturing cells, produced workpieces and work of employees. In the enterprise under research two manufacturing cells: 5 and 7 have the lowest sales profitability. The dynamics of profitability of individual workpieces and employees is varied. The presented structure of information for the needs of the assessment of the performance of the enterprise is a good source of information on the impact of individual manufacturing cells, produced workpieces and employees' work on the directions

of the decisions taken, individual raw materials, materials, components on costs, quality and profitability, and the possibility of the improvement of competitive advantage.

Information Technology of small and medium enterprises in the world (the research results by SAP AG and Oxford Economics Institute)

In 2013 the SAP AG company and Oxford Economics Institute conducted the Internet survey among senior directors, directors - general, presidents, owners of SME in the field of the application of IT. 2100 of chief executive officers from 21 countries of the world, 100 respondents per each country, including Poland, took part in the research. More than a half of those questioned stated that more and more frequently they establish cooperation with suppliers and producers from other countries. According to the respondents, a similar number, more and more frequently, cooperate with companies via online platforms and business networks to advance the implementation of innovative solutions. About 40 % of small and medium enterprises treat the established alliances and strategic partnership as the greatest challenge. Companies from North America, the most profitable ones, claim that in 60 % they developed the cooperation with other enterprises via online platforms and business networks. According to the respondents, processing in the cloud and social media are regarded as important factors which enable running a business activity. Investments in new technologies seem to be the priority for SME. The scope of investments in this field mainly concerns: software for enterprise management, data analysis, mobile and social technologies and processing in the cloud. The research shows that about two thirds of the enterprises believe that technologies will allow them to provide sustainable development and long-term safety. However, these enterprises cope with cultural obstacles in the processes of implementation of information technologies.

Conclusions

Profitability is the reflection of the effects of enterprise management and the reports in this field constitute an instrument of communication of the management with stakeholders of the enterprise and they allow to establish the measures of strategic achievements and their monitoring since there is dependency between reporting in the area of profitability and management, resulting from the fact that reliable information on the capability of enterprise for generating profit involves a range of images and predictions, whose credibility depends on the quality of the system of the enterprise management, also using Information Technology. The presented images of ordering the results of the enterprise activity may be the basis for the construction of the system of strategic information as they concern repetitive decisions, taken in the enterprise repeatedly in different aspects.

References

- Antonowicz P., 2011, *Evaluation of creditworthiness and the threat of bankruptcy of polish enterprises based on financial reporting*, Proceedings of the International Scientific Conference on MMK 2011, Hradec Kralove.
- Brillman J., 2002, *Nowoczesne koncepcje i metody zarządzania*, PWE, Warszawa.
- Chandra R., Shankar V., 2004, *Business process outsourcing: a costs perspective*, "European Business Forum", 19.
- Davenport H., 1993, *Process Innovation: Reengineering Work through Information Technology*, Harvard Business School Press, Harvard.
- Detlor B., 2010, *Information management*, "International Journal of Information Management", 30.
- Goyal A., 2006, *Business Environment*, V.K. Enterprises, New Delhi.
- Hedstrom K., Kolkowska E., Karlsson F., Allen J.P., 2011, *Value conflicts for information security management*, "Journal of Strategic Information Systems", 20.
- Jelonek D., Stepniak C., 2013, *Dynamic Business Process Modeling in the Organization*, [In:] People, Knowledge and Modern Technologies in the Management of Contemporary Organizations. Theoretical and Practical Approaches. Monograph, (Eds.) Csaba Balint Illes, Felicjan Byłok, Anna Dunay, Leszek Cichobłaziński, Szent Istvan Egyetemi Kiado Nonprofit Kft, Godollo.
- Krupski R., Niemczyk J., Stańczyk-Hugiet E., 2009, *Koncepcje strategii organizacji*, PWE, Warszawa.
- Kleas M., 2000, *The History of the Concept of Transaction Costs: Neglected Aspects*, "Journal of Economic Thought", 2.
- Lis T., Tomski P., Bajdor P., 2014, *The Optimization of Information Logistics as the Determinant of Competitive Advantage of an Enterprise in Turbulent Environment*, "Logistyka", 5.
- Lis T., Łapeta J., Lis M., 2005, *Evaluation Methods of Profitability of Informatics Investments*, "Elektronnoe Modelirovanie", 27(2).
- Man M., Modrak V., Grabara J.K., 2011, *Marginal cost of industrial production*, "Polish Journal of Management Studies", 3.
- Nowicki A., Pawełszek I., Stepniak C., 2012, *The Role of Information Resources in Entrepreneurship*, „Zarządzanie”, Zeszyty Naukowe Politechniki Częstochowskiej, 6.
- Pachura A., 2012, *Innovation theory – an epistemological aspects*, "Polish Journal of Management Studies", 5.
- Powell T., 2001, *Competitive Advantage: Logical and Philosophical considerations*, "Strategic Management Journal", 9.
- Ross Stephen A., Westerfield Randolph W., Jordan Bradford D., 2007, *Core principles and application of corporate finance*, MCGRAW-Hill.
- Tomski P., 2006, *Information Technology and Communication in the Aspect of Enterprise Joint Actions*, [In:] The Challenges for Reconversion. Innovation - Sustainability - Knowledge Management, (Ed.) P. Pachura, ISI Pierrard, HEC du Luxemburg, Virton.
- Turek T., 2011, *Selected Areas of Web 2.0 Technology Application in Partnership Enterprises*, Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Nr 205.
- Vance D.E., 2003, *Financial Analysis and Decision Making*, McGraw-Hill, New York.

DOSKONALENIE PROCESÓW INFORMACYJNYCH W PRZEDSIĘBIORSTWACH - ANALIZA RENTOWNOŚCI SPRZEDAŻY W PRZEDSIĘBIORSTWIE PRODUKCYJNYM Z WYKORZYSTANIEM SYSTEMÓW ERP

Streszczenie: Procesy stanowią nieodłączny element systemu technicznego, społecznego czy organizacyjnego. Co więcej, ukazują dynamikę organizacji i są podporządkowane jej celom; dynamizują rzeczywistość organizacyjną oraz umożliwiają analizę przyczynowo-skutkową zmian zachodzących w organizacji i jej składowych elementach. Celem opracowania jest wielowymiarowa ocena zarządzania rentownością sprzedaży przedsiębiorstw produkcyjnych przy wykorzystaniu systemów ERP; w opracowaniu przedstawiono obrazy (okna) oceny wyników działalności przedsiębiorstwa; ich egzemplifikację podano dla badanego przedsiębiorstwa. Zebrane i uporządkowane informacje zaspokajają potrzeby informacyjne decydentów na poziomie gwarantującym metodologiczną racjonalność decyzji.

Słowa kluczowe: procesy informacyjne, rentowność sprzedaży, Information Technology

周圍過程改進信息企業。案例分析採用ERP盈利能力銷售自產的企業系統

摘要：該過程是在技術系統，社會或組織的一個組成部分。此外，他們還表現出了組織的動態和其目標是次級債;更有活力的組織現實，讓事業和組織的變化和它的構成要素的影響的分析。該研究的目的是盈利銷售使用ERP系統的製造企業管理的多維評估;該研究提出了圖像（窗口）評估企業的業績;其例示提供給調查公司。收集和結構化信息滿足的水平，保證方法的合理性決定的決策者對信息的需求。

關鍵詞：信息處理，對銷售退回，信息技術