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USAGE OF PROCESS MANAGEMENT IN THE COMPANY PRODUCING ECOLOGICAL  
TIRES WITH THE SUPPORT OF ICT

VYUŽITÍ PROCESNÍHO MANAGEMENTU V PODNIKU VYRÁBĚJÍCÍM EKOLOGICKÉ  
PNEUMATIKY S PODPOROU ICT

**Abstract**

High level of competition – so-called hypercompetition – is an issue of increasing importance nowadays. Companies who want to be successful in the global market are forced to use modern methods to be ahead of their competitors. We are concerned with such tools and methods that can simplify apparently complicated matters. Since we find ourselves in a changing and global market environment, only a company who is able to respond to changes very quickly can be successful. The implementing of process management is one of efficient methods. Information and communication technologies can significantly help implement process management.

The author of this article describes the usage of process management as an important competitive advantage. The main goal is to design an information system to be used to increase profit and make employees work more efficiently. First of all, main and supporting processes will be identified, based on which the information system will be designed. The system will be created with the aid of MS Access. Thanks to clearly defined individual processes and ICT support, the company will raise its profit.

**Abstrakt**

V současné době se stále častěji hovoří o vysoké úrovni konkurence – o tzv. hyperkonkurenci. Společnosti, které chtějí být úspěšné na globálním trhu, tedy musí využívat moderních metod, které jim zajistí dostatečný náskok před konkurencí. Snažíme se zabývat takovými nástroji a metodami, které mohou zjednodušit zdánlivě složité věci. Jelikož se nacházíme v prostředí globálního trhu a změn, může být úspěšná pouze ta firma, která je schopna reagovat na okolní změny velmi rychle. Jednou z efektivních metod je zavádění procesního managementu. Ke kvalitnímu zavádění procesního managementu mohou velmi významně přispět informační a komunikační technologie.

V tomto příspěvku autor popisuje využití procesního managementu jako významné konkurenční výhody. Hlavním cílem je vytvořit návrh informačního systému, který má přispět ke zvýšení zisku a zefektivnit práci zaměstnanců. Nejprve bude ukázána identifikace hlavních a podpůrných procesů, na jejichž základě bude vytvořen návrh informačního systému. Návrh systému bude vytvořen s podporou MS Access. Díky jasné definici jednotlivých procesů a podpory ICT dojde ve společnosti ke zvýšení zisků.

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## 1 INTRODUCTION

At the current time of hypercompetition, each company has to use methods to ensure it a position ahead of its competitors. There are tendencies towards methods and tools that are able to simplify apparently complicated matters. The implementing of process management, which, in connection with information and communication technologies, brings a company a significant competitive advantage, can be one of the solutions. This article will show, in a simplified form, how to implement process management with the support of information and communication technologies in a medium-sized company. It is a company producing ecological tires for cross-country cars.

## 2 PROCESS MANAGEMENT

Process management represents a new view of the organization and activities management in a company. It is an alternative to the section structure, which divides the company into individual plants, departments, divisions, etc. Each section has its own agenda and responsibilities. In this model, barriers – mainly communication and information – between individual sections may appear which leads to loss of quality of activities important for the company's prosperity.

Process management enables a company to perceive, manage and improve its processes and their resources in order to provide customers with products as efficiently as possible. It is a method of making work flow through the company more transparent, improving customer relations, and meeting various customers' requirements, as well as a method to better utilize the employees' knowledge by means of team work.

It is necessary for good implementing of process management that all processes be defined correctly. The processes currently represent the basic motive force of the organization. They must be understood as objects that can be started, controlled, and revised. A process can be defined as a set of activities requiring one or more types of inputs and creating an output with value for the customer [WOLF 2005]. Thus, a process must be designed so that it meets the customer's requirements and is measurable. Such a process can be further improved. Complex processes can be divided into smaller units – sub-processes. The sub-processes are descriptions of specific activities following each other. It is important to realize that only a process creates added value in a company and that each process has its responsible owner. Processes are usually recorded as flow charts and there are several software instruments available for process modelling and visualization.

One of possible approaches to process management implementation is implementation on the process level. In this approach, the organization is divided into individual processes according to various criteria. In this article, I shall use the division into main and supporting processes.

**Main processes** are processes which create added value in the company. These processes serve to fulfil the company's strategic goals. There are usually only a few main processes. **Supporting processes** do not add value directly; they add it by means of main processes. They serve for effective performance of main processes and they make it possible to control the company's operation [BARAN, PÁLFFY, SCHMELCZER 2005].

The main goal was to create an information system based on the identification of processes, serving for the growth of profit and raised efficiency of work. To elaborate a high quality design, it was necessary to perform an analysis of the organization and existing processes used for the production of new tires. Another important step was to identify the main and supporting processes within the company. Based on this knowledge, the information system was designed.

## 3 MAIN AND SUPPORTING PROCESSES

Since this is a production factory manufacturing ecological tires, the biggest stress is laid on processes related to production. As it was mentioned before, main processes create added value in the company and there are always only a few. These are usually groups of successive processes aimed at one specific area. The following main processes were identified in the company during the process analysis (see Figure 2):

- Marketing – this process relates to market survey activities, creation of offers, promotion, advertising, etc.

- Production – the most important and extensive process.
- Sale and service – key process job management. It includes selection of orders, conclusion of job orders that the company is able to meet, communication with customers, and provision of necessary service.



**Fig. 1** Main processes

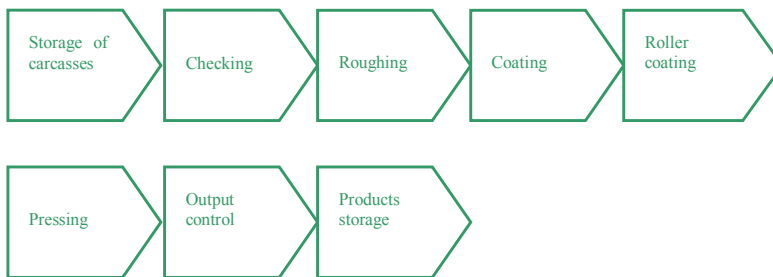
Supporting processes are used to make the main processes efficient. The following supporting processes have been identified as the most important in the company Supplies – fulfils purchase tasks related to dislocation of materials, semi-products and tools

- Quality management – ensures, controls and regulates quality requirements
- Production equipment service – provides for development and service of equipment necessary for production

As these processes are rather complicated, it was necessary to identify their sub-processes. In order to design the information system, it was essential to divide the production and sale and service processes, by means of which the amount and quality of produced tires can be monitored.

### 3.1 Production

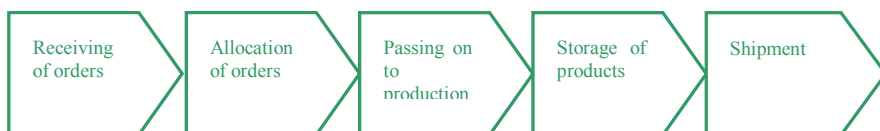
Considering the character of the company, this process is the most extensive and important one in the company. In this process, tires are produced that are later sold to end customers. In terms of the information system, this process is important due to final numbers of produced tires. The production process is further divided into sub-processes: storage of worn-out tires, checking, roughing, coating, roller coating, pressing, output control, storage of finished products.



**Fig. 2** Sub-processes of the production process

### 3.2 Sale and service

As I have mentioned, this is a key process in terms of job orders management. Its sub-processes are as follows: receiving of orders, allocation of orders, passing on to production, storage of finished products, shipment.



**Fig. 3** Sub-processes of the sale and service process

All the identified processes were modelled in the form of flow charts and a process map was created. On this basis, an information system was created which met the original requirements.

#### **4 INFORMATION SYSTEM DESIGN**

The information system was designed based on the identification and mapping of individual processes. The system shall serve as information support for the company's strategic plans. Thanks to a good quality information system, the company can collect important information that enable better management. The information system should also improve control over the flow of material, semi-products and finished products, production process control, planning, and job order management. The described characteristics as a whole will enable the company to gain competitive advantage over other companies and thus raise its profit. Correctly set user interface will also represent an advantage for the company's employees, helping them make their work more efficient – a majority of information will be available in electronic form, well-arranged, and accessible for all processes in real time.

According to the company's wish, the designed information system has been made user friendly – its controlling had to be easy – and based on commonly available programs. That is why Microsoft products have been used.

The designed information system has thus been created with MS Access 2003 software support. It is based on tables, over which queries and from them the necessary macros are created. All processes within the system are connected, which means that the numbers of tires are automatically rewritten from one process to the following. Moving through the system is ensured by forms, in which necessary information are entered by users. The information are the numbers of received and released tires and numbers of good tires in individual processes. The system is set so that it can calculate supplementary information itself – i.e. when the number of good tires in a process is entered by a user, the system will calculate the number of waste products and transfer only the number of good tires to the next process.

Inputs of the information system are entered manually. The advantages of this method are its financial cost and its utilization even in case of failure of automatic data collection. The disadvantages are more complicated updates and the possibility of errors caused by human factor.

With regard to the financial costs, the company decided against automatic data gathering; however, this function can be added later if necessary.

The forms are designed to be simple and easy to understand. An example of a working form can be seen in Figure 6. The upper part contains the numbers of tires in individual processes; the numbers of good and waste products are listed below. The right side part includes function buttons for a given process. In the bottom part there is a sub-form used to add data to the process.

The main advantage of the system is the fact that it is designed for a specific company and tailored to its process map; thus, it is exactly identified with its processes and needs. As opposed to available ERP systems, no adjustments need to be done that could cause incorrect setting of the system.

Another advantage of the system is its simplicity of use. According to the requirement, the design has been created so that users do not have to participate in any complicated initial training processes. The system is controlled intuitively and, as common software instruments are used, most users should be able to control it without problems. This brings numerous further advantages. These include, to name just a few, reduced time and financial expenses that would be necessary for the training of all employees and easy adoption by employees – users. This means that employees will be willing to work with the system and will not think it a useless thing that does not help them in their work. The employees' positive approach to changes in the company is very important and it is a necessary prerequisite for correct functioning of information systems. Since this is a medium-sized company, lower financial costs for the purchase, maintenance and updates of the system are of an advantage as well.

Last but not least, it must be mentioned that this article only contains the design for one part of the information system – the production. To be used further, it must be coordinated with other systems that are already in use and, in the long term, additional important parts to support decision-making within the company – e.g. financial – must be created.

## 5 EXAMPLE PROCESSES

Roughing:

The roughing process includes procedures and methods used to transform production input “used tire” or carcass into intermediate product “roughed tire”.

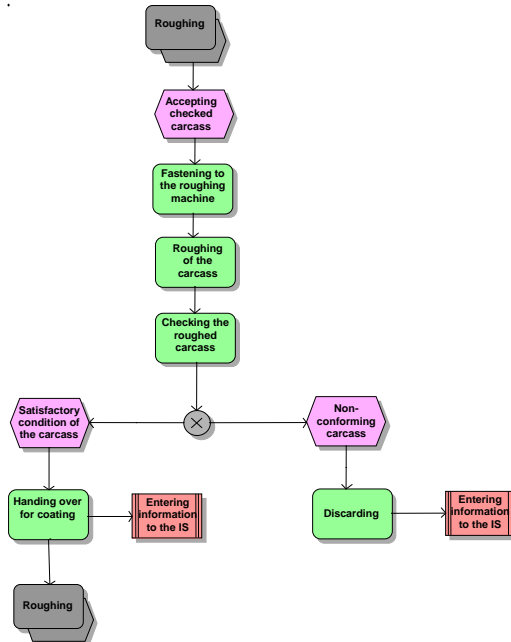


Fig. 4 The roughing process

## 6 CONCLUSION

In my paper I briefly described how process control can be utilized as an effective management method in order to increase a company’s competitive strength. I applied this method to a specific medium-sized company.

The main and supporting processes and their sub-processes were identified and mapped and a process map was created. Then, according to the information acquired, an information system was designed. The main goal of the information system was to increase profit and efficiency of employees’ work.

This design has been verified in practice and it is currently being debugged; moreover, possibilities of its further implementing in similar small and medium-sized companies are being considered.

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