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MANAGEMENT OF LOGISTICS COSTS IN THE NEW PRODUCT DEVELOPMENT PROCESS

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***Abstract*—**This study deals with the development problem of new products and costs related to the function of this important eneterprise. Basically logistics costs are related to material flow, but in recent decades increasingly appears immaterial component of logistics. In development of a new product, there are numerous hidden material and immetiral costs that can stop development projects. Through this study we will present a general model of logistics cost management in the new product development process.

***Keywords*—**logistics costs, management of development, information, management of processes.

I. INTRODUCTION

THE world economy has undergone a global financial crisis, which among other things showed which business models are the most succesfull. Many companies that have relied on the „proven“ methods of business doing no longer exist or are in a very difficult situation. However, companies that have invested in the development of new products and services they survived. The American company „Apple“ is a typical example, but fortunately not alone. For several decades is known that the best developmet is in conditions of high and unfair competition, new products and services provide a tremendous driving force to organizations and the overall economy.

There are numerous models of new product development, but development is expensive and requires the company that in addition to invest extra resources also to invest time and energy in order to change the current way of doing business. One of the neglected function of development is a new logistics product. In mass production, where we have a large number of repetitions of an action logistical costs are strictly controlled, however, when developing a new product hardly anyone cares about logistics. Project development is often listed as a project with control activities in terms of the beginning and the end of budget for each activity seperately.

Logistics in new product development is hidden and hardly visible, the new product development is always accompanied by a certain dose of uncertainity and risk. In case of unforeseen circumstances, the launch of new material and information flows becomes extremely complicated and expensive process. Throughout this study we'll expose approximate solution for the management of logistics costs.

II. NEW PRODUCT DEVELOPMENT

The reason for the creation of a new product is usually of a financial nature in terms of profit acquisiton. Creating a new product is possible to:

- Charge a higher price because it's a new product (fashionn industry is an excellent example),
- Rent a product (vehicles and photo copiers can serve as models for this claim),
- Or simply give away a product and charge additional services and consumption material (razors, printers, cameras can serve as examples).

To have a new product in some industries is not a matter of option but a matter of need, the automotive industry is an example for this because car buyers always want newer and better models. Also the IT has a strong competition in terms of new product development. Whether, in these industries the individual manufacturer does not go towards the new product development then its product program is „choking“ under the onslaught of new products with new capabilities. Of course, all industry branches are not the same. In some industrial branches the new product development trend is not so pronounced, but even then they should think about creation of innovation capacities. It should be stressed that the new product development does not have to be complicated and that little improvements are of the utmost importance, as can be seen best from the following sentences. "Little improvements are essential

to existing products and offer short-term advantages on the market" [1]. The short-term measures or rather little improvements of the company extend the life of its products.

There are techniques that rely on innovation capabilities of companies with the aim of improving the production programme. The purpose of these qualities are to increase the quality, quantite and reduction of cost price, which can be regarded as a discrete innovation that is not focused on the product itself but rather to the production process of an already existing product. The best technique of product development is a mechanism that reduces the risk of investment in the development. "We cannot understand the efficiency of any incentive mechanism unless we have a model of how technological opportunities arise, and a standard by which to know whether investing in them is efficient" [2].

III. THE NEW PRODUCT MANAGEMENT TECHNIQUES

With the development of the market, comparatively there has been developed and the technique development of new products. In the next context of the study, we will provide a brief overview of some significant techniques such as:

- Voice of the custormer,
- „Quality function deployment" (QFD),
- House of quality,
- Kaizen,
- Kaizen event,
- „Lean" philosophy of development,
- Six Sigma phylosophy,
- ISO standards,
- Design methods.

Most of the techniques are derived from other disciplines such as quality management or marketing. Six sigma philosophy has become very popular as to quality management, however, the expansion of this philosophy leads us to the discovery of new applications. It should be stressed out that most of the techniques are possible thanks to the development of information technology. Recent innovations in information technology and techniques offer valuable new ways to use information technology to collect and communicate knowledge across organizational lines and functions, while at the same time reducing that risk [3].

Dissemination of information throughout the organization became one of the most important factors of company operations. Lately more and more is spoken about integrated operations, this phenomenon is important for entire business. „For the system to be a true CIE (computer-integrated enterprise), and to be as productive as possible, the user should input data into the system only once. It is then up to the program logic to route and install the data into the correct tables and databases for processing and record keeping" [4]. These integration provides great opportunities and challenges. Integration capabilities, among other things, breaking the physical boundaries of the company leading to the creation of virtual companies.

Despite all the available techniques of new product development must not be forgotten the role of a man. "To be sure, many technologies own their existence to the inspiration and hard work of individuals, including the unsung heroes who were responsible for the myriad improvements necessary for the realization of new technologies" [5]. People who bring their knowledge and experience are of invaluable importance to the company, especially in situations when they access to new product development.

IV. LOGISTICS OF NEW PRODUCT DEVELOPMENT

The term logistics most often understands the skill transfer of material goods, but in recent decades increasingly occurs informational and human component. Logistics as a science increasingly is being developed and become a basic integrative component that connects a large number of participants in business. This leads to appearance of a new phenomenon called „supply chain", this concept indicates the integration of suppliers, manufacturers, customers and other interested parties. "Producing products alone does not assure a sale, even if such products are actually in demand. Somehow these products must reach the end user otherwise they will be "stuck" in a warehouse somewhere" [6]. All this leads to the fact that the logistics of company is one of the most important components without which there is virtually no effective business.

Information represents an important role in logistics, but each logistics process creates a tremendous amount of information. It concerns to instructions, gudelines, contracts and the like, accompanying the goods through the process. With new information system, collection and processing of data becomes relatively easier. However, information systems are able to collect and emit virtually unlimited amount of data facing us with a new problem. The problem arises in the decision-making process, it is necessary to adopt a tremendous amount of information that unfortunately one can not easily handle. There are several ways to solve this problem, such as, aggregation. According to some authors "… in order to keep computation time and hardware requirement acceptable, data have to be aggregated" [7]. This is a very important for the new product creation process.

Unfortunately the logistics of the new product is insufficiently processed in the literature, of course, when

we speaak in relation to other phenomena related to logistics, which is a pity because new products require greater involvement of the logistics system. "As product life cycles continue to compress and new products accelerate to market at an ever-quickening pace, inventory managers will find their responsibilities growing in the area of identifying and reducing inventory that is no longer required" [8].

It already has been said that the new product development brings certain risks, unfortunately, may be an important factor in deciding to launch the new product development. It is not uncommon for companies to opt for risk avoidance and thus avoid the development of new products. In today's business is practically possible to survive at the leading position without strong development. Therefore, companies are increasingly investing in the planning process of new product development. "This planning process focuses on reducing the likelihood of adverse affetcs on the project by identifying appropriate actions to be taken for each risks for which response is advised." [9] It should be noted that plans are subject to change due to unforeseen circumstances. In these cases, updates can be very expensive especially when it comes to logistics. The fees for the purchase, delivery and storage of some certain specific material may involve more costs.

Logistics is an almost universal component of the company, regardless of size. "New research from John Carroll University and West Virginia University finds that despite many differences, what large and small companies have in common is a dedication to transportation management issues". [8] It is important to note that the logistics of the new product appears in all development processes.

Model of logistics costs management when developing new products (figure 1).

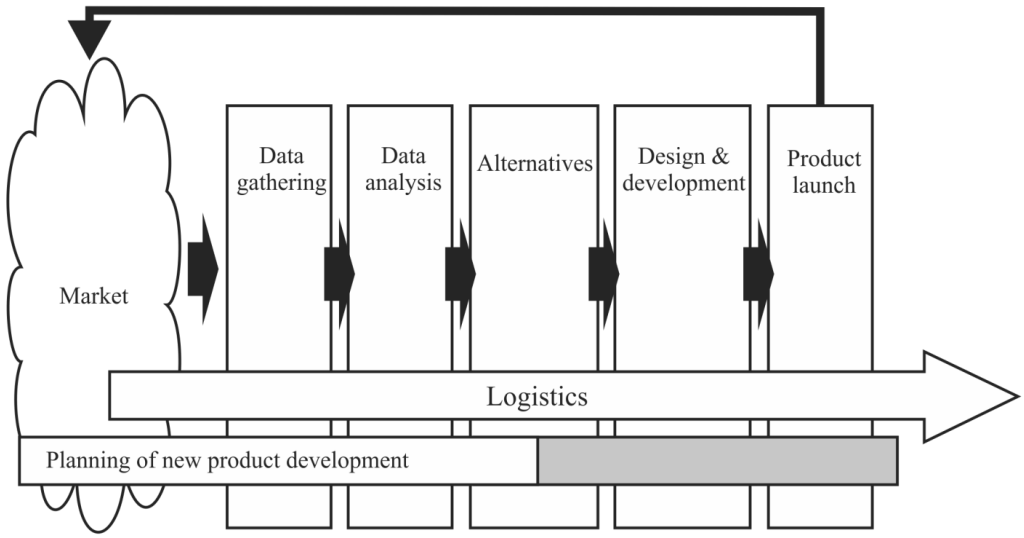

Figure 1. Model of logistics costs management when developing new products

The previous figure shows the impact of logistics on the process of the new product development. For the needs of this model we used a sequential model of development, however, it should be noted that this model can be used and in other models of new product development (open model of new product development, parallel development model etc.).

The starting point of this model is the market that is the main driver of development and the most important „judges" of development outcome. Development planning occurs at all stages, starting even before the commencement of the development process. Based on sales, business strategy, and a similar internal or an external mechanisms, such as the competitive pressures, the companies initiate the planning development process of new products. This model is market-oriented and can easily be used in the event that you want to achieve a model of open innovation.

The sequential approach to new product development is used in this case because it is the easiest way to show and explain. The beginning of sequence is the data collection, this part is very important because based on these data is created an initial plan with rough details. The next-coming element is the analysis of the data, and the bad ideas and vague data are rejected. In this part of the model are two possible errors: the first is to accept the bad concept, another variant is to reject the good concept. The much worse problem is to refuse a good concept, bad concept will sooner or later be proven as such. Creation of alternative is in the next step sequences and indicates an acceptance of an idea or concept and decomposition of the same. Often occurs

that small changes can make big things in terms of easier acceptance of new product. Design and development are penultimate items in the sequence and in this part of the model a new product gets its final shape. In this segment, the new product development model should have already been tested and shown to a few customers. Base on the reaction of the selected circle of customes are made possible modifications. At the end is a product launch in the market. Model begins with a market and ends so.

New product logistics faithflly follows the model and continues to evolve as the product is launched. Without a strong logistics support new product has no chance to succeed in the market. It should be noted that some of the logistics elements must be formed already in the early stages of planning. Part of the development planning should also include planning of logistics functions.

V. CONCLUSION

The presented model provides a certain overview of the development and emphasizes the importance of logistics in the process of new product creation. Through the model can be seen that logistics activities are occurring first after the planning and upon the completion of the plan and realization of new products they're still in long use. In this way the logistics is largely breaking the time horizon of mere new product development.

The negative aspect of this model is the lack of a series of details that would make it more usable, that's why this model has an academic value but not and usable. However, the model has a strong foothold in theory and practice, through research that was conducted on the territory of Serbiathe authors found that the logistics functions had been relatively neglected. Due to the difficult economic situation, most of the companies do not start development capacities, that's why it was not possible to examine the direct effects of this or similar development model.

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