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PRODUCTIVITY IN INNOVATION AND NEW PRODUCT DEVELOPMENT

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Today`s business environment tends to be rapidly and non-linearly changing. Thus, business objectives are very much tied to management of unpredictability and chaos. Some of the changes in the market environment with the potential impact to the ways in which new product development (NPD) is practiced and managed over the past decade include:

- Increase level of competitions in the same market;
- Rapidly changing customer needs and expectations;
- Higher rates of technical obsolescence,
- Shorter product life cycles [1].

The primary impact of these environmental changes is to drive companies to implement those changes that help accelerate products through development and improve process efficiency as well as overall NPD effectiveness and innovation capacity for it [2]. Nevertheless, always moving along the changing environments may totally diverge from the companies planned pathway. Therefore this research studies several aspects of NPD and innovation.

Firstly, it is known that RP is being recognised as a significant technology for future product development. Today more and more manufacturers experience immense pressure to provide a greater variety of complex products in shorter product development cycle. The evolution of the market needs the time-to-market reduction, mainly because the product life cycle is shorter and also because it is very important to produce more rapidly from an initial conception or „idea" to a mass production product [3]. RP, as the name implies, should involve prototyping parts rapidly. Nevertheless, some RP systems are not rapid enough to compete with conventional machining systems [4]. Therefore, different case studies have been taken place in our research in order to find the method for increasing innovation capacity in development of casing type details. Different RP technologies have been implemented and compared as one part of the whole new product development process. On the other hand, the case studies have been executed by taking into account also concurrent engineering for launching efficiently to the final and desired result and modularisation for simplifying and accelerating the speed not only for product development but also for production. In addition, different RP technologies will be compared and some useful tips for future NPD and RP has been investigated.

Secondly, for today there is a new broad view of the innovation process – it is essential and needed that organisations are dealing with the educational dimensions of innovation. Nowadays it is often not enough when firms are focusing only on R&D and on the technological aspects of innovation [5]. Thus organisation's chiefs not only have to

provide physical capital (R&D and technology infrastructure) but should also deal with enhancing human capital (training of workers) and social capital (i.e. encouraging the formation of trust based relationships between other firms). Therefore the innovation capacity of employees and entrepreneurs in the machinery, metal and apparatus engineering sector in Estonia, has been analysed.

Finally, as it has been mentioned that novel applications to inventory management and a inventory classification problems using data mining and seriation has showed great potential also for engineering industry [6], DM implementation for manufacturing area has been analysed. In addition, some solutions for this method implementations have been proposed. Also E-manufacturing together with E-solution opportunities has been handled together with DM opportunities.

Thus, taking the previous into account, this research is about productivity investigations not only for innovation but also for new product development. This research should provide additional surplus values for companies and helps to find useful methods for improving new product development process.

Key words: New Product Development, Rapid Prototyping, Concurrent Engineering, Modularisation, Data Mining and E-Manufacturing

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