THE EFFECTS OF NEW TECHNOLOGY ON PRODUCT KNOWLEDGE MANAGEMENT

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In order to manage the market competition, rapid changes in technology, accelerating industry clock speed, increasing number of product variants, shrinking product lifecycles, limited supply, and price pressures, technology companies need to put more emphasis on managing product launches successfully and timely. Therefore, the focus of this study is to examine product of an manufacturer that operates in high volume and high clock speed industry. Furthermore, special attention is paid to how the company could learn from previous product launches and utilize this information internally when preparing for upcoming product ramp-ups.

Keywords:life cycle product, knowledge product, quality, technological innovation, change management,
JEL : M11, O33

Introduction

In his article Levitt [1965] describes the importance of the concept of product lifecycle and how it should be used as a competitive power.
A key factor in his article is the proactive way of anticipating future stages. Early planning, looking ahead, advance thinking, sample planning and acting are the topics that are discussed widely in his text. Early planning is defined as the promotion of more frequent usage, developing varied usage, finding new users and uses.
By looking ahead the company can become a of competitive and market events and then make noticeable improvements to the short term tactics of the product. When these considerations have been made the company has to also be aware what the impact of one decision has in the following phase (Simula 2008). All the effects cannot of course be forecasted and therefore, the company has to act on the basis of conclusions at its disposal the goal for a product for certain time intervals and therefore, provides the product should go time-in-market, can usually be define as introduction, growth, maturity and decline, four stages have been introduced in multiple sources, the strategic decisions that have to be made in different stages of a product profitable and successful.

Method of research

The article include a theoretical part based on existing research literature on product processes and product launches. That is followed by an empirical study of a case company.
The theoretical section covers topics such as new product development, productizing process, product lifecycle management, lessons-to-learn culture and best practices.
The empirical part of the study is performed as a descriptive case study. The study is descriptive, since it illustrates and describes the topic of management in its real-life context.

Study case: A guide to understanding advances and production.

By identifying the dependencies between challenges created by external factors and the corresponding internal factors to solve the challenges companies can effectively maintain the inflow of profits like in Table 1. (Putkiranta, 2007)

Table 1. Challenges from external factors and corresponding alterable internal factors

External factors	Challenges	Internal factors
Markets request	Competition	Sales
Competition	Customer needs and utility	Marketing
Demand	Manufacturing process	Manufacturing
Supply	Manufacturing production capacity	Product portfolio
Partners	Delivery	Human Resources
Manufacture	Price	Supply Chain
Technology	Quality	Total Quality Management
Economy	Product Reliability	New technology
Law	IT programs for virtual simulation of product	
Environmental management	FEM method programs	

Demand factors such as delivery time, delivery flexibility, demand forecasts and customer specific product requirements are the main creators of challenges from the downstream.
In the upstream challenges originate from material delivery times, availability forecasts and delivery time accuracies. Also several of other external factors such as strikes and competitor pricing develop situations which are challenging for companies (Putkiranta, 2010).
Due to short product lifecycles characteristic of the market, companies have little time to analyze and learn from their previous successes and failures in product launches.

The effect of new technology on product development it's examined following the ramp of LCP cycle for a product (see figure 1)

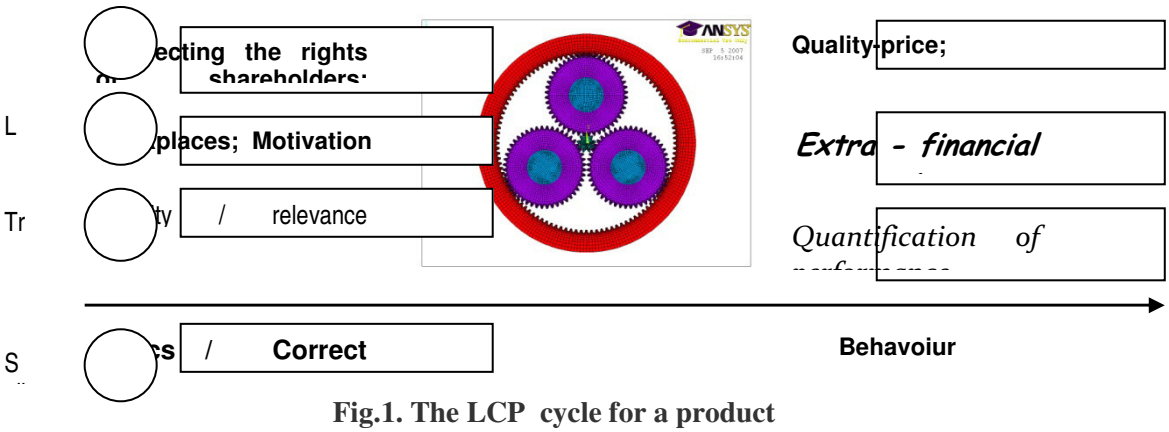

Fig.1. The LCP cycle for a product

Therefore, the purpose of this study is to identify how past experiences in product ramp-ups can be best utilized in a fast clock speed industry.

Objects of study

The objectives of the study are the following (Moyer, 2009):
-To identify challenges in product, planning and management,
-To recognize the ways of improving performance through learning,
-To create a tool for describing and analyzing past product and storing data base information about old and new products.
Are improvements in technology responsible for the development of new products?
Often those who write about future developments in industry and in lifestyles base their predictions on their expectations, often correct, of the advance of technology.

Customer needs and wants drive the development of successful products and the role technology plays is the opposite (Larson 2011).
The lack of the required technology holds back the development of products that, if possible and practicable, could be successfully introduced.
What drove the sale of our products (industrial automation devices and systems) was the needs and desires of the individuals working for our customers (manufacturing companies).
What held us back was the inability, usually due to technological limitations, to produce the desired product at a reasonable cost. (Barbuta-Misu, 2010).
As technology improved, the limitations were lifted and new products were brought to the marketplace (Korhonen 2008).

Results

The study also exhibited that the new product technology has effect on how the ramp up behaves. In products with new technology, issues with upstream, software and demand seem to appear. The products with technology that has been used before have complications with modifications that seem to pop-up in the later phases of product development. (Yin 2003).
The problems with demand, software and upstream in **new technology** appear as slow building order book, delays and supply shortages or quality issues (see table 2).
In upstream problems like supply of mechanics and covers, the solution would be to follow the guideline set by the global supply situation.
Gaining momentum in the project start by collaborating with surrounding elements the probability of succeeding later on is remarkably higher.
Problems with software leading to delays and too tight schedules are common, but the only way to avoid surprises is to have follow-ups to constantly paint the readiness of the platform.
The products with **"old" technology** seemed to have one repeating problem: different types of modifications (see table 3).
It is clear that stand alone solutions will not serve the designers needs, if he wants to have access to all relevant information for a sound product development, further research work has to prove this. On this platform information of various characters are located and shifted around for the purpose of being accessed from any point during the design process using new platforms like Consoli, D. mentioned in his article (2011).

Table 2. Implication and solutions in new technology

New Technology			
Issue	**Upstream**	**Software**	**Demands**
Implication	Supply Mechanical quality Consumer needs Product quality	Optimization Tight schedule Zero wastes	Slowly demands Sales adjustment Product price Life cycle product Quality ISO standards
Solutions	Supply driven action New technology Reduce damage costs	Realistic approach Improve the technology Robust design	Customers request Old fashion product Morale wear product

Table 3. Implication and solution in traditional device of using old technology

Traditional device			
Issue	**Supply problems**	**Cover problems**	
Implication	Manual design Time Analytical calculus Waste of materials	Production output Waiting time Solution for the first sign of damage and product failure Over shape of product ''big robust design''	
Solutions	Supply driven action	Focus on down stream Cost with redesign	Maximize results Mega product construction

Table 4. Implication and solution in using IC programs in LPC

Customers needs and specification			
Issue	Sales for high volumes Quality products Reliability -LCP	Inventory risk Competition –new programs –detecting the failures and future damage	
Implication	Invest money on new trends programs Develop a new orientation about manufacture Change of channel distribution	Significant work in progress and investments for new technology Reduce the wastes from technological process Introduce a new management change Develop a new Knowledge Management of product	
Solutions	Using 7 classical tools to identify the customer needs, Pareto Analyze, Cause –effect diagram	Orientation for new customers strategies	Customers goggles

One approach is to have an integrated product data model and to create views upon this model. Each view represents a specific selection window which gathers all necessary information for a certain need of access.

In some cases the tooling in the production was changed or the diverse mix of sales package contents was not in control (see table 4).

Conclusion

However, for much this stage will prove to be the critical one, many wait until this period before acting, and it is the only stage where some sort of action is critical.

Theoretically the product life-cycle is a smooth and elegant curve; in reality there are constant short-term fluctuations due to external factors (Levitt 1965).

The first common mistake is to assume that any reduction in sales it is a signal of the decline phase of product life cycle.

In this situation we can realized that in fact we can talk about a reengineering of the product taking in consideration the enter activity of the organization, applying a new management change, a new orientation for knowledge product management.

If we take in consideration the product failures form bath cave diagram (a quality tool) with the life cycle product (form marketing point of view) we can identify a new orientation model for engineering and management organization activity (figure 2).

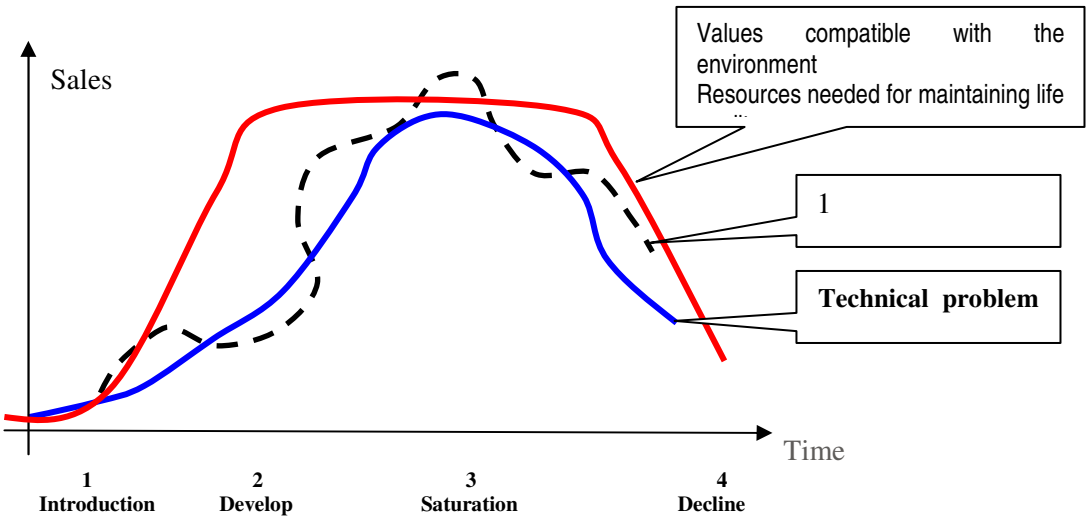

Fig. 2. Life Cycle Product Model theoretical trend, sales and manufacture solutions

The area between stages 1 - 2 may at first appear to be decline, but in fact are part of the growth stage and the fluctuation of product sale taking in consideration the customer perception..
Similarly, the area between points 3 -4 may at first be read as a new growth phase; in fact it is temporary increase that has no real significance because in this period the reengineering is searching a new option for the new product using the old data base of old product (Figure 2.).
The purpose of this study was to establish a model PLC to support the daily tasks of a working company. Due to the limited resources and experimental nature of the research quite a few possibilities were left for subsequent studies. In conclusion the company need to improve his knowledge management taking in consideration the necessity of implementing and developing a new orientation of simulation and virtual design of product in the different stages of LCP.
At least four types of topics could still be implemented in the case company to utilize the new technology power of learning in the case organization, namely the following:
1. Implementing the **learning culture** to support the lifecycle of product,
2. Integrating the tools described in this study regarding the new IT programs to cut the wastes,
3. Making the tools and realized performance in connection with the needs of customers,
4. Establishing a learning culture to reduce the information in knowledge product management and sharing obstacles meet in manufacture design and technological process.

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