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COSTS MANAGEMENT FOR A PROFITABLE NEW PRODUCT DEVELOPMENT

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Abstract. *Costs with an in-advance-determined goal as a technique of strategic management for managing company objectives are very important for competitiveness of contemporary companies on the global market. They, however, demand as well significant alteration in relation with suppliers and customers that became equal partners in the new product development process. A company that is able to lower new product costs faster then others- not compromising with quality and functionality- can increase market share and profit margins. Therefore, it is of the greatest importance, during the process of new product development, to determine costs and prices which customers are able to pay. These costs than become target which designers and production managers should realize through carefully managed production process, and improved relationships with suppliers and other partners.*

1. INTORODUCTION

The circumstances modern companies do their business in have been considerably changed in the last couple of decades. In a highly competitive environment, companies have to manage costs rather aggressively if they want to survive the market match. This contest – the one that imposes aggressive costs management – starts in the earliest stages of life cycle and lasts during the entire product life at the market. To produce a quality product with a satisfactory service level at low costs represents to the leading world companies – that do business globally – "what is implied". Besides, a company that is able to lower most new products costs – not compromising with quality and functionability – may count on a market share increase and sustainable competitive advantage that brings an economic success. Therefore, without doubt, constant innovations with low costs and a high quality product are a business must even in a period of considering entering the market with a new product. These costs have to be such so that provide advantage to a company regarding its competition at the very beginning. Such a requirement is met only by costs of an in-advance-determined goal.

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2. IMPACT OF COSTS CONCEPT ON THE SUPPLY CHAIN PARTICIPANTS RELATIONS

Costs of a pre-determined goal are, above all, the technique of company's future profits strategic management. They begin with an objective – winning a profitable new product – accordingly they represent a modern concept of strategic management named management by objectives (MBO). MBO represents a significant management technique that uses objectives as a primary means to manage an organisation, starting from a notion that the goals as planned decisions are insomuch significant and fundamental that this approach is exclusively based upon them (1,p.170). This process is used by managers of all levels to identify their firm goals, define each individual responsibility regarding the results expected from them, and then to manage objectives. Hence, the activities of the MBO technique would be (2, p.39-44):

- objectives identification and categorisation,
- identification and confrontation of resources and demands, and
- objectives management.

A company development management by objectives is a tehnique that has been given revolutionary effects in practice in area of a new product development realising in advance defined costs with a goal.

A costs concept with an in-advance-given goal has been developed firstly in Japan and has been a reason of significant market share realisation of Japanese producers at the American market place. At first, it has been developed by known Japanese automobile companies as Nissan Motor Corp., Toyota Motor Corp., Honda Motor Corp., Isuzu Motors Ltd., and then some others as Olympus Optical Company Ltd., Sony Corp., Topcon Corp., etc. Indeed, the Japanese automobile producers applied new approach based on prices limited by market for the first time. Namely, it begins with an automobile market price that customers are able to pay. Costs calculations and the price of all elements of a vehicle must be matched with this price. It is achieved by determining of the mentioned costs and eliminating – collaborating with the suppliers – of all unnecessary investments, beginning with the first activity in a product development and process. Costs height is then a result of a joint engagement and functional goals of all the stakeholders interested in, and especially of suppliers. That has, however, demanded a change of relations with the suppliers proceeding from clearly transactional relations into partnership building.

Taught by Japanese car producers experience, American producers – especially Chrysler, have been trying to introduce this new concept of costs and accordingly to place relations with suppliers on new foundations (3, p. 42-56). Starting from production needs and quality products and costs with a goal, Chrysler first did a selection of suppliers they co-operate with, diminishing the number from 2,500 to 1,100. Area of co-operation with them is expanded and deepened specifically in the area of a new product development. Chrysler gained new partners that jointly with the company engineers created concepts for new products and designed all components for their production. Supplier accountability for a prototyipe creation during a product development time and for components production or one vehicle system is big. This means that suppliers of complex components take over total costs responsibility already in the process of product development, that enables them to be more flexible and innovative in providing more effective solutions for a problem. This is why in components pricing, a classical competitive approach with opposite interests of partners has not been applied any longer, but a costs approach with a goal that limits selling prices what could be achieved at market by the seller.

Costs - understood this way- make costs an input for new product development process and not a result reached at the end when all costs are added. The key to success is to design a new product so that buyers are satisfied. Thus, costs with a goal are not a programme for its sake, but an integral part of a new product development process.

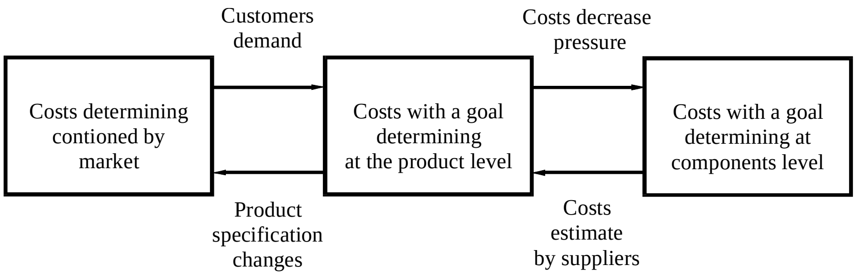

Fig. 1. Three main phases in the process of costs with a goal determining

Otherwise, the very process of determining these costs can be divided into three phases, that is illustrated the best with a Fig. 1. (ad. 4, p.24).

Analysis plays a critical role in determining the part of costs that are conditioned by market, determining the so-called permissible costs. These permissible costs enable to transfer competition pressures linked to costs on the product designers in a company. Costs determining at product level focuses designer's creativity on a new product development, however conditioned with achieving an appropriate costs level. When a company determines costs at product level, it scans them at component level, transferring costs pressure on its suppliers. Suppliers, however, have to find ways to design and produce components so that they themselves can realise appropriate returns on investments when they sell components to producers.

The very process of these costs determining is highly complex as it encompasses more steps in the framework of all the above mentioned phases. Besides, the pressures we explained should be compensated one with another, so that products are products with an appropriate quality and functionality level whereas they provide to every participant in value chain an adequate return on investments. About this process phases more will be said in the next chapter.

3. PROCEDURE AND PHASES OF THE COSTS DETERMINING PROCESS

Noticing the three phases of the costs determining process, Cooper and Slagmulder quote that in each phase phramework, a number of steps can be established that lead to the final objective – a profitable new product development. These steps are analysed at individual phases further on (acc. to 4, p 24-33).

In the framework of the first phase – determining costs conditioned by market – there are five steps:

1. Determining long-term sale and company profit objectives;
2. Structuring of production lines;
3. Product sales price with a goal determining;
4. Profit margin with a goal determining;
5. Calculating of the so-called permissible costs.

Determining costs with a goal begins with setting long-term plans of sale and profit. The goal is to ensure that each product during its life cycle contribute to the company's long-terms profit goals. To ensure reality and credibility of the long-term plans of sale and profit, a company must pay exceptional attention to analysis of buyers and competitors. Therefore, it begins with an entire series of information as: corporation plan, review of technology, analysis of general business environment, analysis of competitive environment, sales trends and other quantitative information. Usually, future sales are anticipated on the basis of sales level from previous periods, market trends and offers by competitors.

Then structuring of production lines follow in order to achieve maximum profitability. Production lines must contain enough products to ensure meeting of buyers' needs, but not too much products that would confuse buyers. Especially, changes of buyers' preferentials should be taken into account in the course of time.

Sales price with a goal determining is the next phase, at the basis of which is a concept of value provided by a new product for product buyers. The buyers will pay higher price for the new product if it provides a higher value in relation to the previous product or the competition product. The leading principle in retail price forming in Toyota, for instance, is that the price of vehicle stays the same until there is a change in function of the previous model, because only this change alters perceived vehicle value in the eyes of buyers. That means, increase of retail price is based on perception of additional value that comes out of new functions.

Taking into account expected market conditions, companies have to ensure the most realistic sale prices. That's why an entire series of internal and external factors has to be analysed as for instance Nissan does. Namely, from the internal factors, it analyses a model position in the product matrix, strategic objectives and profitability goals, while from external ones, it analyses the corporation image, buyers loyalty level, product quality and functionality comparing to the competition offer, expected prices of the competitors models, expected market share.

Determining of profit margins should ensure realisation of long-term company profit plan. The company can determine profit margins in two ways. In the first method, one starts with the real profit margin of the previous product afterwards it is adapted to the market conditions changes. In the second model, the company begins with the profit margin of the entire production line (or some other products clustering) and increases or decreases profit margin for individual products within the cluster, depending on the real situation at the market.

Permissible costs calculation – after the company establishes sales price and profit margin – is a rather simple one and is done by the following model:

Permissible costs = Sales price with a goal – Profit margin with a goal

Thus, permissible costs that reflect relative competitive position of a company are calculated as a difference between anticipated (projected) sale price and wanted profit (5, p.47). They are, in other words, market deduced costs, which realisation is tended to, and they are determined by projected sales price on the basis of relation trends of supply and demand for a new product and other internal and external factors action that influences the sales price and that are already mentioned.

As such, permissible costs do not take into account capacity of costs decrease by a company designer. This is enable only in the second phase – by determining costs at product level.

In this second phase of the determining costs phase, the product designers are focused on finding the ways of new products development, that would meet buyer's needs, but at a permitted price. In practice, however, it is neither so easy nor possible to find ways of doing so. To realise costs, changes in production process and given product turnover are necessary. Significant savings can be realised in the design and development phase of a new product. In this phase, product characteristics are developed upon the customers ability to pay, that is, it is designed so that pre-determined costs are realised (5., p.47). Therefore it is a characteristic of this costs concept not to design first a new product then to calculate its costs, but vice versa – first costs are determined as a price of product costs, only afterwards its design.

Determining costs at a product level is done in three steps (ad. 4, p.28):

1. Determining permissible costs with a goal at product level;
2. Ensuring discipline in the process of determining costs with a goal;
3. Realisation of production costs with a goal not sacrificing the product functionality and quality.

Having permissible costs determined upon external conditions (market conditions) and not taking into account capabilities of company designers and suppliers, there is a risk that these permissible costs are not going to be realised. Namely, at highly competitive markets, buyers expect that every new generation of products is better regarding higher quality and functionality or lower prices. Each of these improvements, or their combination requires that company decreases new products costs in order to keep profitability. The goal of decreasing is reflected in the degree of decreasing costs needed to reach permissible costs, that is a result of subtracting permissible costs out of present costs of the product that a company realises. Naturally, the company must really evaluate what the achievable and what the non-achievable possibilities are in cutting down the costs.

In the second step, since the company has determined the goals of cutting down the costs, process of product designing can begin. The main engineer and top-management must continually monitor progress of engineer in design and production in achieving this objective and take some corrective actions as soon as possible. On the contrary, the most important rule can be endangered: "costs with a gain must never be surpassed". This rule can be realised in three ways by a company. Firstly, whenever improvements in design result in costs increase, company must find an alternative compensating the costs increase saving at some other point. Secondly, company will not launch a new product which costs surpass objectives. Thirdly, production has to be managed carefully in order to ensure achieving costs with a goal.

Company might jeopardise a rule that costs cannot be surpassed in the three following cases only. Firstly, when introduction of a new product leads to increased sales of other products in production programme. Secondly, when it has been expected that product will lead to increased sales of next generations products. And thirdly, perhaps most significantly, when bringing a product at the marketplace in time so critical for success that costs are of second-rate importance. Some studies show that exit at the marketplace with a new product is of more importance for gaining competitive advantage (6 p.282). Namely, a six-month delay in new product introduction can diminish cumulative profit up to 35% for a five-year period of time. On the other hand, introduction of a new product in time, with costs even 50% higher than budget, diminishes profit potential for 4 % only. Some world companies managers prefer coming out with a new product in time, in order to outrun competition, to exceeding budget for the new product development. All this leads to a conclusion that competitiveness based on time gains in the case of innovation greater significance in relation to competitiveness based on costs.

Realising costs not sacrificing functionality and quality of the new product is possible by applying some engineering techniques like security engineering, quality function development and alike.

When a company has determined the costs on product level, it develops these costs on product components level. Thus the company transfers competition pressure related to the costs it meets onto its suppliers. This objective is specifically significant for firms that are more horizontally than vertically integrated, as they purchase considerable part of material and components more from exterior than superior suppliers.

This phase consists of several steps as well (ad. 4, p.30-33):

1. Decomposition of product costs with a goal into function level;
2. Determining costs at component level;
3. Managing suppliers.

A new product development is usually multi-functional project performed in a teamwork. These teams usually encompass representatives of different functions as for instance: R&D, product design, production engineering, material purchase, production and spare parts purchasing. Main engineer is responsible for each function costs determining. Costs are usually based upon particular rates of costs decrease realised in past, however they can be based both on functional analysis and productivity analysis. Besides, some companies use market analysis to determine costs, that is especially applicable when product functionality is changed.

These costs decrease rates from past as well as market analyses should lead to such costs decrease of each function that sum of main functions costs equals to costs on product level.

When a company determines main functions costs than it breaks them down into component level. The objective is to establish purchasing price payable by the company for each component purchased externally and which must be respected by the suppliers. Therefore, it's highly important and good to manage suppliers that primarily relates to the supplier selection process and awarding of suppliers for finding out creative ways of costs decrease of components with which producers are supplied.

A critical decision company is to make upon price forming at component level is whether to purchase components from internal or external suppliers. This process begins with evaluation of internal or external suppliers regarding components sales price they can supply with the producer. That's why the producer must prepare a detailed order for new model where all needed components are listed. Then, these orders are distributed to internal and external suppliers who they will be most probably purchased from, with a detailed description of each component and its partial production volume. Suppliers than evaluate the price and time of each component delivery.

The sum of expected components costs in a given function has to respond to that function costs. If the sum of components costs is too high, it is necessary to make additional costs reductions, that is done in the further process of negotiating until a final agreement with the supplier concerning costs is reached.

Company can deviate from costs with a goal only in very specific circumstances and usually for a brief time period. The goal of this relaxation of costs is to enable supplier to realise reasonable return on investment until finds a way to reduce costs to a target level.

Besides, a lot of companies have special plans for awarding a supplier for creativity in innovation and finding ways for additional costs decrease. These plans include supplier awarding for total or partial order for a particular component. For instance, if Nissan accepts an idea on costs decrease, it awards the supplier that suggested it with a significant percentage of contract for that component for a defined period of time, for example 50 % for the following twelve months.

4. Conclusion

Costs with an in-advance-determined goal as a technique of strategic management for managing company by objectives gain ever important place in a competitive fight of the world companies for realisation of greater market share and wanted profit level. They, however, demand as well a significant alteration in relation with suppliers and buyers that become equal partners in the new product development process. Concept of costs demands appropriate infrastructure provided by information technology and just-in-time logistic systems. However, building of trusts and readiness to sacrifice short-term interests for long-term objectives of profitability and sustainable competitive advantage is yet most important. A classic competitive relation with the opposite interests of participants in a value chain does not exist, but building of relation of partnership where all are equally interested in and share a new product fate that is launched at the marketplace. Such attitudes and relations showed that for a long-term success sake, classic competitive pressure and fights must be surpassed, and through co-operation and collaboration, groups of linked companies have to fight for realisation of common goals at market place.

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UPRAVLJANJE TROŠKOVIMA ZA RAZVOJ PROFITABILNOG NOVOG PROIZVODA

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Troškovi sa unapred određenim ciljem kao tehnika strategijskog menadžmenta za upravljanje kompanijom pomoću ciljeva su veoma značajni za konkurentnost savremenih kompanija na globalnom tržištu. Oni, međutim, zahtevaju i značajnu promenu u odnosima sa dobavljačima i kupcima koji postaju ravnopravni partneri u procesu razvoja novog proizvoda. Kompanija koja najbrže može smanjiti troškove novog proizvoda - a da ne čini kompromise u pogledu kvaliteta i funkcionalnosti- može povećati tržišno učešće i profite. Zato je od najveće važnosti, tokom procesa razvoja novog proizvoda, odrediti troškove i cene koje su kupci sposobni da plate. Ti troškovi onda postaju cilj koji dizajneri i proizvodni menadžeri treba da ostvare kroz pažljivo upravljanje proizvodnjom i poboljšanje odnosa sa dobavljačima i drugim partnerima.