

## PROBLEMS OF MEASURING SUCCESS OF A NEW PRODUCT

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**Abstract.** *There are numerous problems in measuring new product success. Considering the importance of a new product for business performance of enterprise as a whole, the authors suggest that it is first necessary to identify the critical success factors and then the measures. They indicate numerous individual measures, which could be separately used for the measurement of new product success as well as their drawbacks. The problem could be overcome by integration of the measures into a multidimensional system of valuation.*

### 1. INTRODUCTION

Identifying and developing a new product is always a messy, experimental process. For many companies this process is more difficult and less successful than necessary. The process of introducing new products is as risky as it is vital to the long-term success of companies. The number of new products introduced globally is increasing every year, but most of them fail. Revolutionary new products often come from upstart players or companies outside the industry whose vision is not limited by a focus on the current business and markets.

To remain successful innovators, business managers must continually review their companies' to meet the three conditions for effective innovation:

- Closeness to customers – Managers must know their customers and understand their needs and requirements well,
- Multifunctional teamwork – Successful product innovations are almost invariably the result of people in the company working together in teams rather than independently, and,
- Cross-functional communications – Innovations in most companies refer to the information flow between the key functions.

One of the most important themes in innovation research has been an attempt to identify the factors that are associated with new product success. Measuring new product outcomes from innovation is also crucial for our understanding the organizational behaviors

related to, and the resource allocation provided to, new product development. Although the importance of measuring new product success is widely recognized, its treatment remains elusive, partly due to the multidimensional nature of such success, the different levels of analysis that can be examined, and the multiple stakeholders who look for different things in the new product development product. This has resulted in the use of large number of measures in the assessment of new product performance.

There are numerous problems in measuring new product success. Taking into consideration the importance of a new product for business performance of enterprise as a whole, it is necessary to identify both the critical success factors and the measures. A review of relevant literature indicates greater simplicity in the process of critical success factors' identification. Logically, there are some differences, depending on the character of innovation (for example, radical versus incremental innovations), business model of enterprise (market-oriented enterprises as different forms of networks versus enterprises with traditional business models), size of enterprise (big global companies versus small and medium enterprises), etc.

However, the problems arise in identifying the system of new product success measures. The point is not in the deficiency of individual measures, but in imprecise definition of the subject of measures as well as in inadequacy of result interpretation. Isolated measures that are not integrated in the system of performance measures of enterprise as a whole, distort the picture of efficiency and effectiveness of enterprise. This is especially related to the new product success evaluation.

Attempting to overcome the problem, the different models for valuation have been created. The authors first analyze the critical factors of new product success, especially in condition of expressed connection of different participants in value chain, and, after that, they point out some problems in selection of new product success measures.

## 2. DEVELOPMENT OF NEW PRODUCTS IN THE NEW ECONOMY

The experiences of a large number of enterprises show that the failure in product development, particularly related to the products representing the basis for the creation of a whole range of other, so-called product platforms, originates from the phase of the product concept definition. The risk is more pronounced in the cases of developing the products that should create the needs of consumers. In such circumstances, when completely new products of high risk are created, technological and marketing uncertainties have to be studied in order to reduce or eliminate the risk of their implementation. The enterprises that are successful in this field are characterized by the management through projects, which enables successful management of each individual project and a network of projects within the enterprise, of interactions and relations among different projects and of the relationships with the environment [1, pp. 109-120].

The surveys of the practices of successful companies [2, pp. 116-124] suggest that adequate approaches (methods and techniques) in the product creation and development should be selected in the conditions of abrupt technology and market changes. Different approaches may be applied. However, it is important to emphasize that an approach would be more successful if it:

- Creates a clear product course map of the enterprise where the managers, regardless of their functional location, understand the significance of the product for the enterprise. Product maps help in defining key priorities, in timely decision-making and in defining the products that shall represent the grounds for further development. This enables not only the improvement of final products but also the elimination of the lost efforts that divert the enterprise from more important activities. The product maps, as well as the processes that create them, are the central parts of the total product development process;
- Develops the product strategy "without voids". Successful firms create a multitude of products in order to fill up the appearing voids in the market and satisfy new needs of their consumers. By studying the consumers and their purchasing motives, new market opportunities are identified and competition is neutralized;
- Collects and uses valid information from the market and cooperates in particular with consumers and suppliers. The product creation process includes consumers-innovators, who are the first to accept the product and who appear in the role of referential groups, which facilitates not only a full satisfaction of consumers but enables the realization of the desired enterprise performances.

A successful product definition implies a timely (early – in the phase of the product concept creation) and significant involvement of customers in the process of its development [3, pp. 418-425]. Thus, the opportunities emerge for creating specific products for different market segments, the development and production costs and time are reduced, the services that add value to the product are improved, and the customers are tied to the product. The best way of creating added value is to create a concept of expanded product to the consumer's standards. It is risky to expand the physical product too much, as this may cause a reorientation of consumers to other products and producers. Tying of consumers reduces their transactional expenditures, which directly affects their increased loyalty. The information on how the consumers validate particular product characteristics and components and how the deliveries by suppliers help to offer value added thus becomes the basis for increasing the profitability of all the partners.

A synergy in using the enterprise resources and competences is achieved by establishing special business units and designing teams for the development and launching of new products. The teamwork, including all the partners, reduces technological and marketing risks of the new product development. The dialogue with consumers and suppliers enables collection and application of the information that helps eliminating potential discrepancies, reducing the costs and shortening the time-span of the product development and launching. This new marketing approach to the management of projects or products is characterized by the following: retaining of customers primarily through constant contacts, focusing on the product benefits, highly emphasized services that add to the product value, high loyalty to consumers and readiness to satisfy their expectations. The quality should be the responsibility of all the employed in the enterprise, and not only those working in the production unit [4, pp. 828-837]. The market position of the enterprise gains strength by joint creation of the products that represent the fundament of the line, which may be extended by adding new products.

Application of the so-called platform approach is one way of offering a customized product to the market. It implies the process of identification and usage of common elements in the enterprise offer, of target customers and the process of delivered value crea-

tion. The platform-based offer creation contributes to the cost reduction, the time shortening, the quality improvement, the offer synchronization, a greater number of options, and the relationships with consumers, suppliers and other participants of the process of value creation and delivery.

The development of platform-based varieties contributes to the reduction of costs (which results from the standardization of components built in the product and the fixed equipment that is exploited much more efficiently by the application of specialized tools), and to the dissemination and joint usage of knowledge of all the linked subjects. Thus, for instance, the companies in the car industry, which create "platform products" by means of strengthening partnership relations, increase their participation in the market by 5.1% each year. In contrast, the companies that do not foster such relationships and still make individual products face a decline in their market participation by 2.2% annually [5, pp. 19-31].

The capability for and speed of introducing new products are of the utmost significance for the strategic positioning of the enterprise and its major competence. Flexibility can be defined, *inter alia*, as the capacity to make the production volume vary per unit of labor time without affecting the quality and efficiency. The speed of reacting to the market demands and the ability of delivering the value in time also mark the enterprise flexibility level. Flexible systems of production enable the product modification in each phase of its life cycle, as well as the alterations in the product mix when the demand level changes.

Creativity and development of creative ideas are the key elements of the innovative strategy. Creativity motivates the generation of new ideas, which is one of the major determinants of innovation. Innovativeness is conceptually defined as a successful development, adoption and implementation of creative ideas. Thence, the creativity that implies the generation of new and important ideas stands as an indispensable but not sufficient forerunner of innovations. The product differentiation, based on creativity, is the stage in which the new product characteristics are superior to the products of the competition. The superiority is expressed by the uniqueness, quality, cost rationalization and technical performances, which contribute to the increase of loyalty and satisfaction of consumers. Creativity is an intangible strategic resource, which is flexible, valuable, rare and hardly imitable. The creation and launching of a new product in the present business conditions is all the more successful if it is based on the market orientation [6, pp. 114-132].

Market orientation accelerates the creativity, as it includes generation and dissemination of the marketing knowledge and information in response to the market needs. In the context of a new product development, the orientation towards customers comprises a knowledge collection of customers as a response to new and significant stimuli. Customer-oriented enterprises improve the creativity of a new product and marketing program and increase the innovativeness of the organization.

The orientation to the competition is regarded as the capability of the firm to identify, analyze and answer to the competitive opportunities and threats and to increase the information level of the organization. The orientation to the competition affects positively the creativity of a new product and marketing program. Competition-oriented enterprises constantly investigate the behavior and position of major competitors, which contributes to the creation of products and programs that differ from the competitive ones.

Cross-functional integration has a positive impact on the creativity of a new product and marketing program, since it enables the generation of a superior value for target customers. In the sphere of the new product development, this is manifested in the level of interaction and communication, the level of information distribution and communication, the degree of joint involvement in managing specific tasks. The cross-functional integration facilitates the generation, collection and dissemination of market information on new stimuli from the environment through functional domains, thus increasing the creativity. This also includes the open generation and dissemination of new ideas, solution of the problems and susceptibility to changes.

A keen market competition leads to the increased interconnecting and networking of enterprises, providing thereby the possibilities for the synergy of resources, learning and flexibility. The dependency and firm correlation of different partners (enterprises, customers, suppliers, competition) strengthens their competences and creates the conditions for a continuous strategic customization. The benefits from the development of firm relationships exceed their costs. New technologies are spreading and becoming more available. The involvement of customers makes it possible to select the trends that they desire. The cooperation with suppliers reduces the costs and improves the system of values. The problems of deficient qualified personnel can be overcome by introducing teams from several organizations. The long-term relations of loyalty and trust improve the performances of all the involved participants. Therefore, the product development process has to include all the network members that dispose of necessary resources and skills. The cooperation of the mentioned participants or potential partners in the process of product creation and launching, and in general project management, develops into a new source of competitive advantage. Better understanding of values preferred by consumers creates a sustainable advantage for each individual partner.

### 3. CRITICAL FACTORS OF THE SUCCESS OF NEW PRODUCTS

A significant issue related to the success of managing a new product development project is the identification of critical factors of success. This is the basis of their selection, determination of priorities and allocation of resources, starting from the characteristics of the new product project, major competencies of the enterprise and features of the market (consumers and competition, above all). Since the measures of new product success are different and each enterprise uses its own system of standards, the enterprise management should decide on the project selection criteria within the framework of a complex system of business performance measurement.

Technology was formerly considered as the only factor of a new product success. A new product was the result of a proactive research and development and the application of science. Such approach is known as the technology pushing. This approach is still very successful, especially in high-technology branches, where the changes in the market are very fast and projects are extremely expensive and risky. The development cycles of such technologies, as well as of the products resulting from their application, are ever shorter. The producers of high-technology products are forced to shorten the periods of new product development and launching [7, pp. 87-103].

Recent case-study research emphasizes a highly significant role of the market research and the marketing function engagement in stimulating the need for a new or improved product. The process of new product development is progressively acquiring the characteristics of a market-managed project. Rapid technology and market changes impose the need to coordinate research-developmental, technological and marketing strategies.

Numerous empirical research projects [8, pp. 439-456] show that the critical factors of the new product success are the following:

- Definition of a new product prior to its development – the analysis and selection of a target market, identification of the benefits for potentially profitable consumers;
- Integration of consumers into the process of value creation (from the idea to the realization of the product). This is a very complex process, in which the most difficult part is to provide reliable information necessary for shaping a customized offer. The application of modern information and communication technologies and the execution of online marketing research enable successful overcoming of limitations, while the costs of activities in the customization process are reduced to acceptable limits;
- The product innovativeness;
- The product superiority based on the quality as a strategic instrument and on the superior value delivered;
- Superiority based on other elements of the offer – services offered to consumers, which eventually increase the product value;
- Controlled cannibalization;
- Flexibility enhancing the adjustment potentials even in the industries falling into the group of so-called mature ones. Computerized operations are the most flexible. In view of the situation in some industries and branches, particularly in certain enterprises, the levels of competence in flexible production, and therefore innovation, are varying largely. However, empirical research points out that the organizational culture is crucial for the enterprise transformation into a flexible system that reacts proactively to the market requirements;
- Inter-functional coordination, technological and marketing synergy and involvement of the top management into the process of new product development, which contributes to more efficient time management;
- High-quality performance of new product development activities;
- Organization and guidance of the project of a new product development, launching and commercialization by adequate strategic positioning;
- Logistic activities largely restrain successful commercialization of a new product. It is not enough just to make a product fit the buyer's standards. Although the activities related to the product delivery to the buyer enlarge the value for customers, they may represent significant limitations as well. Alongside with the development of the Internet and electronic trade, that is of the appropriate marketing infrastructure, it becomes easier to solve the problems of delivering value to consumers [9, pp. 81-87; 10, pp. 91-101; 11, pp. 101-113, 12, pp. 197-212, 13, pp. 507-519].

The balance of strategic and tactical objectives is crucial for the success of a new product. In this respect, it is necessary to analyze critical factors that influence strategic or operative decision-making (Figure 1, 14, p. 357).

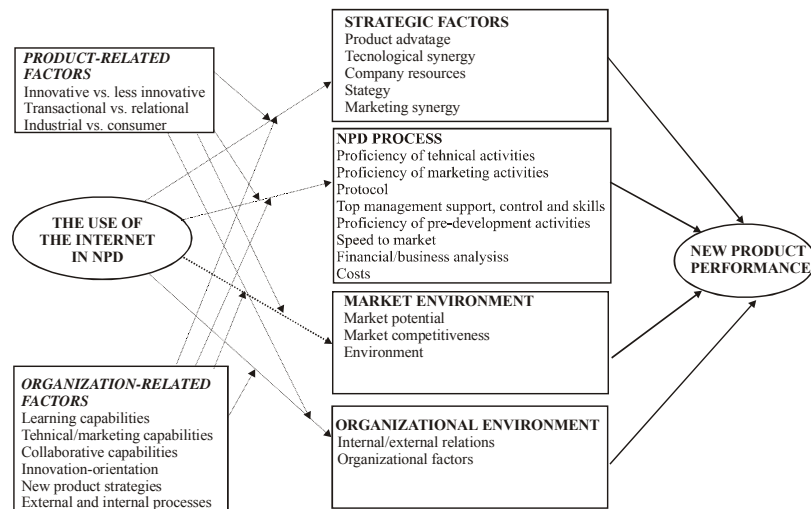


Fig. 1. Key Factors of New Product Performance

#### 4. MEASURING NEW PRODUCT SUCCESS

New products are important for business success of enterprise as a whole. Measuring new product success and its contribution to business performance of enterprise as a whole is a very complex process. A fundamental problem when measuring new product success lies in the meaning of such success, as it has not been well defined. The interpretation of success is affected by the interest groups involved in new product development (R&R, production, marketing).

Complexity of measuring comes from character of innovation - radical, incremental, compatible and incompatible. Radical innovation has a high probability of failure but can be more profitable than incremental innovation. Similarly, incompatible innovation can be more profitable than compatible one. An idea is radical if it meets one or more of three tests: it changes customer expectations and behaviors, it changes the basis of competitive advantage and it changes industry economics [15, pp. 76-84, 16, p. 361].

The time perspective of new product success also increases the difficulty of selecting relevant measures [8, pp. 439-456, 17, pp. 85-99, 18, pp. 115-133]. In the short term, it is most important to launch a new product to market. In the long term, the emphasis is on financial performance.

Success can be a value-laden concept. These problems have been aggravated by the fact that little theoretical work has separated success indicators and determinants (for example, if customer acceptance is an indicator or a measure of new product success [19, pp. 118]). Measuring success implies a possibility to make a difference between project success and contribution of program of new product development to the success of enterprise as a whole. The majority of the proposed measures are noncumulative and theoretical, making comparisons difficult or impossible. New products impact on an organization can be multilevel and multidimensional, complex and dynamic, subtle and perceivable in the long term [20, pp. 23-41].

There are no reconciled opinions in the literature on new product success measures. Some authors [21, p. 395] identified five independent categories of success measures: product utility measures, program success measures, individual product success measures, financial performance measures, and measures of customer acceptance of new products. Many authors cited individual measures that could be used in new product success evaluation. The number of measures varies. Some authors induced 10 measures [22, p. 374]: rate of success, percent of sales, profitability relative to investment, range of technical success, influence on sales, influence on profit, success in meeting sale goals, success in meeting profit goals, profitability relative to competition and global success. Empirically, they identified three new product performance aspects, which they termed: financial performance, market impact and opportunity window dimensions.

There are many authors who indicated the need for using both financial and nonfinancial, as well as direct and indirect measures of new product success. Hart, for example [23, pp. 22-36] identified three project level success dimensions, namely, beating the competition technologically, beating the competition to market, and providing a technological breakthrough. Some authors suggested that success could be measured from both technical and economic perspective and that multiple criteria were needed if a correct assessment was to be made. The Product Development Management Association collected 46 measures from 77 publications and also gathered 34 measures that were used and 45 measures that people would like to use [24, pp. 429-458].

The presented and other sources signify that some measures are used more often than others. The analysis shows that 16 measures are cited in almost all the sources, which are the key for new product success measurement [19, p. 119]. The measures are: customer acceptance, customer satisfaction, meet revenue goal, revenue growth, meet market share goal, meet unit share goal, break even time, attain margin goal, attain profitability goal, attain return on investment goal, development cost, launched on time, achieve product performance goal, meet quality guideline, speed to market and percentage sales by new product. The measures could be integrated into several groups: customer acceptance measures, financial performance measures, product or technical measures and organizational level measures.

Integrating individual measures into a complex system, such as balances scorecard or strategic map [25] makes some real assumptions for more efficient measurement, which, in their turn, ensure managing of the process of new product development. The system's authors explained how BSC could help in strategy implementation. Management can formulate a strategy and implement it top down but will need good bottom up information to optimize it. A good alignment between strategy and BSC use is a key for success. This is an iterative learning process including and connecting the key indicators of performance and their optimization. By integration of two important systematic approaches, balanced scorecard and activity-based costing, reliable information for measuring new product success can be obtained. Innovation and improvement perspective, as a particular system of measures in balances scorecard, enables measuring importance of innovations, which create new revenue and market sources. It is known that all new products of enterprise do not equally contribute to value creation. Namely, the practical investigations show that a great number of new products destroy or reduce the value. Turning toward value-added activities requires from management to evaluate success in an adequate way and integrate the measures in an integrated system of measures and control. It is also especially



important in new product success evaluation as well as in marketing customer (buyer) and supplier relationships control. The focus upon identifying key success factors and their adequate measures requires integrating the systems of success control and measurement, both of individual indicators and enterprise as a whole.

#### CONCLUSION

Constant invention and launching of new or modified existing products to the market represents an imperative of enterprise growth and development in the contemporary business conditions. There are numerous problems in measuring new product success. Considering the importance of a new product for business performance of enterprise as a whole, it is necessary to identify both the critical success factors and the measures. Review of relevant literature indicates greater simplicity in the process of critical success factors identification. Logically, there are some differences, depending on the character of innovation, business model of enterprise, size of enterprise, etc. The problems are more expressive in creation and selection of adequate measures for new product success valuation. The theory and practice know of many individual measures whose use in the new product success measurement is quite limited. The problem could be overcome by their integration into a multidimensional system of evaluation. The multidimensional system of evaluation contributes to:

- Introducing and launching right products - The aim could be achieved if the most valuable products are introduced and launched, namely, those whose participation in profit of enterprise is optimal;
- Capabilities for right value creation - Analysis of present clients and their future needs and requirements is the starting point for creation of products corresponding to customer requirements;
- Inducting the best processes - The ways of creating and distributing value to customers could be very different. The abilities for inducting the best processes are often limited by inadequate introduction of enterprise in different forms of business networks, inadequate technology, limitation to invest in developing new capabilities, knowledge, and skills; and,
- Motivating employees - Superior value of new products is created by satisfied, motivated, and loyal staff. The system for knowledge management and its development stimulate the creation of new competences. The quality of business processes will be at higher level if the employees who are in direct contact with clients are constantly training.

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## PROBLEMI MERENJA USPEHA NOVOG PROIZVODA

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*Problemi merenja uspeha novih proizvoda su brojni. S obzirom na značaj koji nov proizvod ima za poslovne performanse preduzeća kao celine aAutori sugerišu da je neophodno prethodno identifikovati kritične faktore uspeha, a zatim i merila. Ukazuju na brojna pojedinačna merila koja se mogu izolovano koristiti za merenje uspeha novog proizvoda, kao i na nedostatke njihovog izolovanog korišćenja. Problem se može prevazići njihovim integrisanjem u multidimenzionalni sistem vrednovanja.*