

# Measuring Results of New Product Development

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**Summary:**

It is necessary to measure the results of new product development in order to establish the current level of product innovation and define what has to be done for its improvement. The subject of research in the article is measuring the results of product innovation. The article is aimed at identifying the directions in terms of which the measuring of results is to be considered. Our goal is to shed light on the different points of view thereon.

The need of measuring results of new product development is justified. It is shown that each determinant of product innovation performance serves three functions: of a goal; of an indicator and of grounds for personnel motivation. It is proved that, albeit different, the said three functions are interrelated.

The article defines the difficulties in measuring the results of new product development. It is proved that the main difficulties in measuring results are related to their use by a broad circle of

managers, to the intangible nature of the new product development performance, to the fact that product innovation is related to nonstandard and extraordinary tasks and the development of a new product is related to both insecurity and the organizational complexity and of lack of concentration on the new product development activities.

A system of indicators for measuring the results of new product development where different indicators are used at each company level is proposed. There are three levels of measurement using their relevant indicators: level of the separate new product project; level of the product innovation process and strategic level. The concept that it is necessary to choose an optimal number of indicators that could facilitate the efficient management of product innovation within the company is defended.

**Key words:** New product development, Product innovation, Measurement of new product development, Indicators for measurement of results

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## 1. Introduction

The speed of new product development, the quality of the results obtained from it and the costs related thereto are three key determinants used for evaluating the company's product innovations. New product development beginners are often told that to be successful their new product projects must be good at at least two out of the aforementioned three determinants. Is this practice-based advice reasonable? Should ambitious goals be limited to two of the three determinants? The answer to this question requires a definition of the "faster", "better" and "cheaper" determinants first and then an assessment of any possible combinations between them. Measuring results required to answer two basic management-related questions: what is the current level of company product innovation and what has to be done to improve this level?

**The object of research** in the article is new product development in a company. This is an activity, which, on the one hand is of essential to increasing the competitiveness of a business unit, while on the other hand it is related to a significant risk of failure. Product innovation efforts are not of routine nature and usually involve specialists from various fields.

**The subject of research** is measuring the results of product innovation. There is a number of reasons why this subject of research is a rather complex and versatile

one. First, the concept of measuring results has a large number of meanings; secondly, there are a lot of reasons for its performance; and thirdly, the results are used at different levels within the organization. One can add even more considerations that can further complicate the subject of research:

- there is always a difference between what can be measured and what must be measured;
- a determinant that can be used in a certain project usually cannot be applied to (an)other new product project(s);
- no determinant is good enough to reveal the overall picture in the company's product innovations; different companies, and even different managers within the same company, need different numbers of determinants.

With regard to the thus defined subject of research we have to clarify that the concept of "measuring results" is used in literature in at least three meanings: first, the concept may mean a **specific determinant** like a number of new products marketed by the company within the last 2 years; secondly, the concept may signify **the measurement process** – for example the organizational process of collecting information and its analysis; thirdly, the concept may denote a significant **aspect** of the long process of strategic planning – for example the process of goal setting and performance assessment aimed at company strategy revision.<sup>1</sup>

<sup>1</sup> To see how the concept of "measuring results" of new product development is used in literature take a look at Montoya-Weiss, M. and R. Calantone, Determinants of new product performance: A review and meta-analysis, Journal of Product Innovation Management, Vol. 11, 1994, pp. 397-417.

The aforementioned three meanings of the concept of "measuring results" turn the very measurement into a kind of challenge. **The article is aimed** at identifying the directions in terms of which the measuring of results is to be considered. **Our goal** is to shed light on the different points of view on the measurement of results of new product development and thus facilitate any future research in this area of marketing.

## 2. Need for measuring results of new product development

Each determinant of product innovation performance serves three different functions. The first one is the function of a **goal**. A goal is a specific result that a company would like to achieve and so directs its resources to do so within the limits of a certain plan for achieving such goal. For instance a goal can be defined as product development within a three-month period. The second function is of an **indicator** or of an actual measuring instrument. For example, an indicator of covering the project duration is the number of days between coming up with the idea of a certain product and launching the finished product on the market. The third function of the determinant is to provide grounds for personnel **motivation** – for instance, a criterion for specifying additional remuneration in the case of successful completion of the project in due time (within a three-month period).

Albeit different, the three functions of the new product development performance determinant are interrelated. Identifying

a particular goal specifies the direction of operation and at the same time sets a challenge for a company's personnel. The determinant's motivational function is related to the responsibility of the personnel involved in new product development. The function of an indicator reflects the willingness and the possibility for monitoring the progress of product innovation and its results. This function also allows for information assurance of task planning and performance.

An example of the interrelation between all the three functions of measuring results is the interaction between the motivational function and the goal and indication functions. The staff remuneration is fairer when objectives have been clearly set and indicators for assessing the achieved results have been introduced. If no indicators are used, or those used are inappropriate, there is no motivational effect of remuneration. If a company does not treat the three functions as interrelated, then goals, indicators and motivational mechanisms are developed separately and can even contradict each other. This would ultimately mean poor management of the new product development process.

Ensuring interrelation between the three functions of measuring results is a necessary but insufficient condition for the good management of product innovation, given that each of the three functions has some additional requirements attached thereto. For example, as far as goals are concerned – has the most appropriate

goal been selected? This question is related to the company's entire strategic planning process. Regarding indicators – are the items that have to be measured really measured and, if they are, are they measured in the way they should be? For example, the participants in the product innovation process may focus on specific goals where faster or better results can be achieved at the expense of other important organizational goals, the achievement of which may not be subject to measurement or encouragement. With regard to motivating process participants – have the remuneration system and the rest of the motivational factors been structured properly in view of achieving the set goals?

So it can be concluded that in order to make the most of the advantages provided by measuring results of new product development companies have to take into consideration both the existence and interrelation of the functions described above and the need to identify these functions in the proper way.

### **3. Difficulties in measuring results of new product development**

Measuring results of new product development is far more complex a process than other management areas. The main reasons for that may be classified as follows:

First of all, results from the measurement are used by a broad circle of managers, each of them having their own needs and depending on a different set of results to

support their decision making. For example top managers need few determinants that are summarized, strategic in nature and can be used for prognostication. At lower levels managers need wider ranges of determinants that are more specific, specialized and tactical in nature.

Secondly, new product development performance is of an intangible nature. A major part of the product innovation performance cannot be observed since it is to do with knowledge and involves gathering and transforming information, developing knowledge and organizational learning. This intangibility renders finding and measuring the results of the new product development much more difficult.

Thirdly, product innovation is related to nonstandard and extraordinary tasks. Standard and routine tasks and processes are measured more easily than unique and extraordinary ones such as the majority of the efforts related to new product development and introduction. Some new product development aspects more easily lend themselves to measurement than other aspects (e.g. task performance time, costs and components related to product features and project budget). Those elements are more tangible and definable and they can more easily be covered by the company's accounting systems. New product development implies some novelty, i.e. something different from what it used to be. Such novelty can manifest itself in any nonstandard task or difference from the established

routine practice. Established indicators may become inappropriate when the task is new and they be at variance with the nature of such new approach.

In the fourth place, new product development involves some insecurity. This insecurity refers to markets, technologies, intercompany organization, and interaction with external organizations. Such insecurity further complicates the measurement of results since it makes the choice of an appropriate determinant and the accurate assessment of achieved results more difficult. Instability, unexpectedness, uncontrollability and even immeasurability of certain factors may considerably influence the achieved results.

In the fifth place, new product development performance is usually not concentrated. Tasks and projects often require the involvement of specialists from various fields and different levels; they involve various fields of knowledge and a number of workers, as well as middle and top managers. New product development efforts often go beyond the organization limits and include various suppliers, partners, distributors and consumers. Such organizational complexity further impedes new product development result measurement.

#### **4. Characteristic features of indicators for measuring results of new product development**

Each indicator for the measurement of new product development result can be described by using four determinants:

purpose, target, type and relations to other indicators. Analyzing those four determinants is used as grounds for differentiating between different types of indicators, comparing them and establishing their strong and weak points.

##### *Purpose of indicators*

Purpose is related to the management issue that the indicator helps to resolve. Indicators are used to get into the essence of any studied phenomena and find answers to important management questions. Such questions justify the use of a particular indicator and thus define its purpose. Typical management issues are for example supporting decision making, planning, goal setting and performing innovation activities; assessing the performance of a completed or continuing task or project; comparing certain tasks or projects; evaluating the advance with regard to certain strategic or tactical objectives; allocating or relocating resources, etc.

##### *Target of indicators*

Target is related to what is measured, to the unit of observation or analysis. Indicators should be selected in such a way that they are capable of finding the target; otherwise useless or misleading information will be obtained. Which targets or units of observation are possible? They can be arranged from bottom to top level as follows: individual, task, function, project, portfolio of open projects, list of impending projects, strategic business unit.

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### *Type of indicators*

Type describes the way of measuring. Indicators are of different types, the major ones being:

- *Quantitative and qualitative indicators.* Quantitative indicators are numerical indications and are usually regarded as more objective. Qualitative indicators are verbal descriptions or evaluations and are therefore considered as more subjective.
- *Process indicators and output indicators.* Output indicators describe the actual effect of the performed activities while process indicators cast light on specific aspects of work currently going on. Process indicators provide interim results as compared to output indicators. Such indicators for example are: number of ideas generated per new product; number of currently active projects; number of developed prototypes, etc. Unlike them, output indicators are more often used by companies as they are more tangible and easier to define. However, using output indicators only is not a good approach since in conditions of high uncertainty of developing new products the connection between income and outcome is not so direct. In fact companies can influence the new product development process and therefore process indicators have to be used.
- *Past time, current and prognostic indicators.* With past period indicators there is a time discrepancy between the event occurrence and the report of its results. With current time indicators there is a slight time

difference and so any information provided is actually of the particular moment in time. Prognostic indicators result from applying specific approaches and methods of forecasting future conditions or results.

- *Financial and non-financial indicators.* Financial indicators are related to a company's benefits from the implementation of a given new product project. They refer to sales, profit or determinants that are their derivatives. Non-financial indicators refer to various aspects of realizing product innovation.
- *Tactical and strategic indicators.* Tactical indicators are more specific, usually quantitative and they are the predominant type used. Strategic indicators are more general; they can be both quantitative and qualitative and are fewer in number.

### *Relations to other indicators*

This indicator determinant shows what other indicators it is connected to, the way it affects them and the way it is affected by them. The connection between indicators is an important feature of theirs. Product innovation management is currently facing the challenge of implementing a system of indicators where separate determinants are intentionally related and synchronized and not disconnected from each other. Meeting this requirement facilitates the implementation of the company strategy, improves its ability to make the right decisions at all levels and provides the organization with greater opportunities to learn from experience.

### 5. A system of indicators for measuring results of new product development

For each level the company uses different indicators to measure the results of new product development. Three levels of measuring results can be differentiated with their relevant indicators:

- *separate new product project level* – at this level indicators are focused on the advance of a particular new product project, on quality and on any other results of the project;
- *product innovation process level* – what is measured here is the process quality, the balance between the separate functional areas involved in the process and any results achieved in the process;
- *strategic level* – at this level indicators are focused on the strategic balance between the participants in the process and the company's financial results.
- Although quite a few indicators can be identified for each level it is important that the company selects the ones that best correspond to the specific features of its innovation activities. "The more, the better" is not a solution. What we need is an optimal number of indicators that could facilitate both decision making and the efficient company management in this area.

#### *Separate new product project level indicators*

In the process of regular inspections of a project advance the team in charge undertakes to attain certain (interim) results

within the terms specified. If the team fails to perform its tasks, it has either promised to do more than what is possible or it have done less than what is possible. Whatever the case is, certain changes have to be made to the project so that its progress can match the expectations of the company management. The following indicators can be used at this level:

1. *Level of achieving the results planned for each project phase.* The aim is to achieve all the targets. In certain cases some activities may be delayed but in any such case: the reasons for any non-performance have to be identified; the effect of such non-performance on the rest of the project activities has to be assessed and plans have to be developed for the implementation of the next project phase.
2. *Level of achieving performance indicators.* Such are the market share forecast, the sales forecast and some other indicators affecting the financial results and being the target of the tasks undertaken by the new product team. Performance indicators have to be updated upon the inspection of the progress under each project in order to establish any speedup or delay in performance indicators in comparison to the plan.
3. *Schedule adherence level.* The aim is to follow the approved project schedule and avoid any delays. A delay in any activity most often leads to another delay and as a result the negative effect on the entire project may be significant. For example,

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any delayed market launch of a product may deteriorate performance indicators and render the entire project useless.

4. *Budget adherence level.* New product development costs are related to the project performance indicators and so the aim is to avoid excessive costs. However, development costs may be less important than other indicators. For example, it may be reasonable to raise product development costs to be higher if this ensures a faster market launch of a product or a lower production cost of a new product.
5. *Level of turnover in the main project team.* Turnover in the main team makes it difficult for its members to work together. Turnover decreases the commitment of the remaining team members; it results in a precious knowledge leak that accompanies any leaving team member and it takes time and efforts for new team members to become familiar with the project. The reason for high turnover often has its roots in the way new product development is organized; it may be the result of the shortage of resources or of the company's poor interest in product innovation. This problem usually requires intervention by the top management.
6. *Number of changes in the product parameters.* The great number of such changes may expose the negligence in specifying any requirements to a product. Another possible reason is insufficient time has been spent at the

initial phase on clarifying a product's desired features. Changes in parameters may result from changing the schedule and exceeding the planned costs.

7. *Level of using existing technical solutions.* This indicator is also known as platform usage. It should be as high as possible. What is meant here is the fact that efforts aimed at developing new products are more efficient when past developments and already existing technical solutions are used for each particular project. The wider the use of technological or product platforms, the lower the project costs and the faster products are launched on the market.

### *Product innovation process level indicators*

A company aims at achieving greater process efficiency. Studies show that greater efficiency results in faster development of new products, lower costs for resources, greater number of new products and higher revenue from new product sales.<sup>2</sup> To evaluate process efficiency and direct any efforts aimed at its improvement a number of indicators can be used. For example:

1. *Share of resource secured projects.* For each approaching project phase a team needs certain resources. Ideally, 100% of the projects, i.e. all projects, have to receive the full amount of resources planned for them for the relevant phase. If some of the projects do not receive all promised resources the schedule will be

<sup>2</sup> Cooper, Robert. *Winning at New Products: Accelerating the Process from Idea to Launch*, Third Edition, Basic Books, 2001.



impossible to follow and the portfolio will be packed with active projects.

2. *Share of projects satisfying the schedule and the cost restrictions.* This indicator describes innovation activity expectedness. The aim is to avoid projects being ahead of or falling behind their set goals.
3. *Time required for each phase.* The purpose of this indicator is to provide an opportunity for comparison between a company's achievements and its competitors' results. Thus the need for corrective actions emerges. For instance, if companies similar to ours need three months to develop and test a concept while our company needs five months to do so, the reasons for such excess should be examined. Comparison to competitors allows the setting of appropriate goals so that the overall product development time can be shortened.
4. *Total NPV (Net Present Value) of developed products.* This indicator is a total of the net present values of all products being developed at a given time. The total NPV shows the company's growth potential.
5. *Share of new products achieving or exceeding the set goals.* Many companies do not keep the practice of checking whether new products have achieved the goals set at the beginning of their development project. This trend is negative as far as it does not allow an objective and long-term assessment of

the company's innovation success. This indicator's starting point is the goals set for the product in the original plan and it studies the product results achieved during the first year of its launch on the market. The share should be high – over 80% and as close as possible to 100%. The very goals set for the product are easy to define and measure: whether development time and costs are at the planned level; whether the number of products sold during the first 3, 6 or 12 months is as planned; whether a product margin is according to plan, etc.

6. *Product development average investment amount.* This indicator may be calculated when the total sum of the major groups of costs made by the company for a certain period of time (for example 1 year) in connection with all products being developed is divided by the number of products launched on the market during the same period of time. The sum of costs would include the costs of: labor performed by new product developers; equipment and consumables used in product development; all kinds of functional and consumer tests and trials; product market launch and promoting sales during the commercialization stage.
7. *Management time share devoted to new product development.* Research shows that top managers' commitment enhances the product innovation process. Company managers' commitment is crucial when such process is a relatively new one and less important when it

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has already been improved many times. Inclusion of this indicator does not mean that company managers have to deal with technical activities and separate project level activities, but that their commitment is required with regard to activities that the new product success depends on.

8. *Number of ideas entering the idea screening phase from the idea generating phase.* The greater the number of ideas, the better. If the number of ideas is too small it will be difficult to select those that satisfy a company's strategic goals. To define the optimal number of ideas to be generated it is necessary to start keeping records and trace several figures:

- the number of ideas entering the screening phase;
- the number of ideas going to each phase of the process;
- the number of ideas reaching the market.

Records of those figures must be analyzed together with goal achievement data regarding the revenues from sales of new products. In many countries with regard to some branches there is comparative data of the number of ideas to be generated for a successful product launch on the market.

### *Strategic level indicators*

Company managers aim at achieving maximum return on investment when developing new products. They need

guarantees that any costs made are in line with the company's strategy. Furthermore the products being developed should match the company's objectives and investments should help the company achieve its goals in terms of income and growth. A set of financial and strategic indicators is used at company/strategic level and their purpose is to evaluate the efficiency of the company's efforts used in developing new products and to guarantee that the company's investments contribute to achieving the desired growth. Such indicators are:

1. *Share of the revenue from sales of new products/share of the number of new products launched on the market in the last X years.* For companies operating in fast moving consumer goods this indicator may be quite high – for example 40% of the sales may come from products launched during the last 2 years. For companies belonging to older and more slowly developing branches like chemical industry this goal may be at a 10% level or even a lower percentage of the sales may come from products launched in the last 5 years. Any non-performance of the set goals shows that the results of the product innovation process do not match the expected levels and an analysis of the indicators describing the new product development process level is necessary. Any overperformance

<sup>3</sup> Discussion about the Resource-Based View (RBV) of the firm and value creation see in Netseva-Porcheva, T., 2012. Tsenobrazuvane na baza tsennost – v tursene na pechelivshi tsenovni reshena. Sofia: Izdatelski kompleks – UNSS, s. 26-27.

of the set goals is also grounds for analysis since the reasons for such overperformance should also be found – for example, whether older products do not do worse than expected, which could in turn be a sign of the advance of a significant change in the target market trends. The importance of this indicator should not be overestimated as far as companies in which the number of new products launched is their crucial business objective are not that many, considering that the profitability of separate products varies greatly across industries. Besides, this indicator depends on what is understood by a new product – a company may launch on the market a smaller number of products of higher degree of novelty or a greater number of fake products of lower degree of novelty.

2. *Investments in new products as a share of sales.* Comparing new product development costs to sales allows companies to supervise how efficiently they use the resources targeted for innovation. For example, a chocolate producing company may have a 5% rise in sales while the costs for developing new kinds of chocolate may rise by 8%. This would increase the share of new product costs in the revenues from sales, which, provided everything else remained unchanged, would reduce the profit margin. This indicator allows company managers to assess their commitment to new product

development. If, for example, the share of product innovation costs is too small, then it is clear that a company does not rely on new products. To define the share of such costs a comparison has to be made to the average value for the branch as a whole or to the average value for the branch leaders.

3. *Shareholder value added.* On the whole, this indicator reveals the point of developing new products. Product innovation uses some of the company's resources in order to increase the business value for shareholders.<sup>3</sup> For example, a more efficient new product development process may increase the company's profit with 5 stotinki per 1 BGN share value. One can see to what extent new product development increases the market value of various business units within a company. This could be used as a standard for a more efficient allocation of resources for innovation activities across the company with the aim of maximizing the market value of the entire company as a total of the values of its different business units.

## 6. Conclusion

Measuring results of new product development is an interesting topic for further studies. On the one hand company managers realize that an appropriate measuring of results is crucial for product innovation management, while on the

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other hand researchers start to pay more and more attention to the efficiency of the systems used for measuring results and their impact on product development. The study of systems for measuring results of new product development is still in its early phase compared to the studies in many other product development aspects. This is partly due to the difficulties in studying those systems.

Measuring the results of new product development should be regarded as a significant company skill. There will never be an ideal selection of indicators or a perfectly functioning system of determinants. Some important aspects of new product development can even be immeasurable. Nevertheless, companies should go for a rational and managerial decision making oriented system of indicators that is developed and updated together with the organization. Indicators and results measurement systems are subject to change and adjustment to their company environment, to the company's strategies and to the new product development activities. Therefore a company should not go for developing a perfect system

of indicators but a flexible one that can possibly change together with the modern dynamic environment.

The specific features of indicators for measuring results of new product development have also been specified. Each of those indicators can be described by using four determinants: purpose, target, type and relations to other indicators. The analysis of those four determinants is the basis for differentiating between different types of indicators, comparing them and revealing their strong and weak points.

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