



Determination of target parameters of product service as an element of innovation activity of Enterprise

Determinación de los parámetros objetivo del servicio del producto como un elemento de la actividad de innovación de la empresa

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Received: 18/11/2017 • Approved: 30/10/2017

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ABSTRACT:

Level of service predetermines consumer's tendency to acquire product. Redundancy of offers at market makes companies seek for additional competitive advantages to emphasize their product among the majority of similar ones. This is what comprises relevance of the work. Its goal implies target parameters of product service as an element of innovation activity of enterprise. In the modern context the service is the one of significant sources of income for equipment manufacturers. International competition provides the necessity of putting emphasis just on the service. This, in turn, stipulates the necessity of goal-oriented service management and, correspondingly, makes issues of revealing key indicators of service activity actual. Authors of the paper represent existing models of innovative product service, offer authors' goal-setting model for product service at enterprise, describe current limitations and conditions of applying the model. There are also requirement to production of enterprise for different service levels.

Keywords: Limitations, resources, method, interaction,

RESUMEN:

El nivel de servicio predetermina la tendencia del consumidor a adquirir el producto. La redundancia de ofertas en el mercado hace que las empresas busquen ventajas competitivas adicionales para enfatizar sus productos entre la mayoría de los similares. Esto es lo que comprende la relevancia del trabajo. Su objetivo implica los parámetros de destino del servicio del producto como un elemento de la actividad de innovación de la empresa. En el contexto moderno, el servicio es uno de los principales fuentes de ingresos para los fabricantes de equipos. La competencia internacional proporciona la necesidad de poner énfasis solo en el servicio. Esto, a su vez, estipula la necesidad de una gestión del servicio orientada a objetivos y, en consecuencia, hace que los problemas de revelar indicadores clave de la actividad del servicio sean reales. Los autores del artículo representan modelos existentes de servicios de productos innovadores, ofrecen modelos de establecimiento de metas de los autores para el servicio de productos en la empresa, describen las limitaciones actuales y las condiciones de

1. Introduction

The key problem of modern companies is the complexity of service organization by virtue of insufficient information awareness of executives about current trends in the sphere, big number of factors having impact on service effectiveness, lack of resources and time for the organization, insufficient integration of service into system of sales. As a rule, the executives far not always understand what to begin with, how to set goal of service and how to unfold it to the system of subgoals. There are many goal-setting methods having own specific features and sphere of application, which requires intelligent selection with account of service specificity (Gordeyeva, 2015; Lukyanova, 2006; Prigozhin, 2010; Shevtsov, 2016). Besides, the problem is reinforced with availability of wide range of limitations of different types that make impact on freedom of choice in the area of service (Gribov and Leonov, 2011, p.18; Komarov and Chulkov, 2014, p.17; Udaltsova and Naumova, 2011, p. 38). Specificity of service also manifests in the necessity of considering relation between types of service operations and their quality and volume on the one hand, and type of production on the other hand (Ostrovsky and Volin, 2008, p. 52; Lankhorst, 2012, p. 13; Larman and Vodde, 2008, p.85; Larman and Vodde, 2010, p. 14; John, 2010, p.74; Sulemani and Nasir, 2010, p.22; Schwaber, 2004, p.63; Litvin and Lyubomirskiy, 2003, p. 35; Resnick et al., 2011, p. 181; Fazal and Raham, 2011, p. 91).

The theoretical and methodological basis of the research is comprised by scientific works of national and foreign authors. Thus, various aspects of service management are described in the works of such authors as: Alekhina E.S., Gornostaeva Z.V., Gribov V.D., Gukova O.N., Duvanskaya E.V., Komarov N.M., Leonov A.L., Naumova E.V., Perter M., Udaltsova M.V., Chulkov V.O., Yastrebova E.N., etc. The issues of goal-setting were also dealt by such scientists as: Vladislavlev P.N., Litvak B.G., Miles T., Ogilvy D., Prigozhin A.I., Shevtsov A.A., Yuditsky S.A., etc. The issues of organization management theory, features of application of system analysis in enterprise management, as well as adaptive management technologies are specified in the works of such scientists as: Andreychikov A.V., Andreychikova O.N., Altshuller G.S., Anfilatov V.S., Baldin K.V., Bush E.D., Volin Y.M., Vorobyev S.N., Emelyanov A.A., Zlotin B.L., Zubov I.V., Kydryavtsev A.V., Kukushkin A.A., Lukyanova L.M., Orlova E.R., Ostrovsky G.M., Parfenova V., Tarasenko F.P., Filatov V.I., Shpakovsky N.A., Shimukovich P.N., Bjork A., Fazal U., Goodpasture C., John C., Larman C., Litvin S., Lyubomirskiy A., Michael de la Maza, Nasir M., Raham S., Resnick S., Schwaber K., Sulemani K., Vodde B., etc.

To reach the desired goals authors have set the following tasks:

1. To define interaction pattern for elements of goal-setting system within service: goal - limitations - method or limitations - goal - method;
2. To represent existing models of setting goal criteria of service, reveal their advantages and disadvantages, as well as sphere and conditions of their application;
3. To offer authors' model of goal-setting for service under conditions of existing limitations, to define conditions for increase of its flexibility and robustness;
4. To reveal factors defining the choice of service level for different types of products.

Subject of the research is represented with models of service for manufactured goods available at today's market.

In general, innovation activity is the activity that is aimed at search and realization of innovations for the purposes of product line extension and increase of product quality, improvement of technology and organization of production.

The innovation activity not necessarily should be carried-out on a permanent basis - even more so at small enterprises where such a statement of question is just impossible. However one should appoint a worker who would bear personal responsibility for success of innovations. He should be in charge of timely detection and change of obsolescent products, equipment, technologies, as well as of all-round analysis of production and administrative activities (X-ray business) and development of innovative measures. In addition, the worker being responsible for innovation activity should be an opinion leader at enterprise.

The common factors having impact on innovation activity of enterprise include cyclical fluctuations, influence of which on economy constantly strengthens as the result of globalization process. Competition between sellers of innovative products makes executives of enterprises increase production technical level and, correspondingly, the quality of products, reduce operating costs in an effort to increase effectiveness of innovation activity. So, the competitive struggle at innovation market activates development of innovative aspect in enterprise activity, which, in turn, requires use of definite mechanisms.

2. Materials and methods

Subject of the research covers principles and methods of determination of target service parameters under conditions of existing limitations and types of products.

Research methods in the work are represented with: management theory (Blinov, 2016, p. 18; Yuditsky and Vladislavlev, 2005, p.32), system analysis method (Andreychikov and Andreychikova, 2013, p.5; Anfilatov *et al.*, 2009, p. 34; Vorobyev and Baldin, 2009, p. 68; Zubov, 2003, p. 25; Orlova, 2007, p.61; Parfenova, 2014, p.60; Tarasenko, 2010, p.26), goal-setting methods (Gordeyeva, 2015, p.18; Altshuller *et al.*, 1991, 15; Lukyanova, 2006, p.38; Miles, 2014, p.106; Ogilvy, 2012, p.14; Prigozhin, 2010, p. 84; Shevtsov, 2016, p.91), servisology (Gornostaeva *et al.*, 2016, p. 139; Gribov and Leonov, 2011, p. 96; Gukova and Yastrebova, 2015, p.173; Komarov and Chulkov, 2014, p 16; Udaltsova and Naumova, 2011, p. 148), agile management technologies (Ostrovsky and Volin, 2008, p.54; Lankhorst, 2012, p.19; Larman and Vodde, 2008, p.43; Larman and Vodde, 2010, pp. 36-42; John, 2010, p.13; Sulemani and Nasir, 2010, p.97; Schwaber, 2004, p.36; Litvin and Lyubomirskiy, 2003, p.189; Resnick *et al.*, 2011, p. 74; Fazal and Raham, 2011, p. 94). These methods allow us to consider the researched problem as the goal-oriented and organized process on improving target parameters of industrial products service. Besides, for the purpose of solution development authors have used such instruments of TRIZ (Altshuller, 1991, p.6; Vorobyev and Baldin, 2009, p.98; Altshuller *et al.*, 1985, p.69; Litvak, 2012, p.67; Shimukovich, 2015, p.46; Shpakovsky, 2011, p.92) and economic analysis as ikaering, technology of formulation and resolution of contradictions, algorithm for solution of engineering tasks, resource analysis, factorial analysis, causal analysis, etc.

When developing service model any enterprise have to consider the following issues: choice of service level, determination of service factors, and determination of service goals.

To meet expectations of consumers enterprise provides different levels of service: premium service, standard service, economical service.

Choice of the level depends on the following factors:

- market segment, within which company works;
- complexity of product;
- expenses for maintenance of required service level;
- potential gain from service.

Goals of service are:

- time of equipment repair;
- required rate of profit from service;

- to provide customer's loyalty;

Table 1
System of goals, criteria and indicators of service goals

No	Goal	Criteria of goal	Indicators of criteria
1	To solve customer's problem	Total time for problem solution	Speed of problem detection
			Speed of problem diagnostics
			Time of search for solution
			Time of solution realization
		Quality of problem solution	Amount of problems that have been solved on a turnkey basis after first appeal
			Amount of problems that have been solved without drawing customer from his main activity
		Number of solved problems	Amount of problems in percentage of possible amount of problems
Prevention of problems in future	Repair interval without equipment break down		
2	To provide required rate of profit from service operations	Price for service operations	Does not exceed definite share of product cost
			Does not exceed definite share of customer's budget
		Expenses for service operations	Do not exceed "Price - Profit rate" level
			Amount of new technologies implemented into processes
			Conformity of new technologies to modern level, yes/no
		Profit rate	Required level in percentage terms
Falling behind leaders of branch			
3	To provide customers' loyalty	Repeated visits of customers	Number of repeated visits
		Customer service quality	Customer's satisfaction index

		Readiness of service workers to respond to customers problem	Response time Time of problem turn-key solution
4	Growth of company's income	Economic effectiveness	Economic efficiency of service
		Cost of customers attraction	Unit cost as per customer; customers conversion
		Number of customers	Dynamics of customers' number growth
		Return and profit from service	Average purchase size
5	Provision of feedback for product designers	Customers' proposals on product improvement	Amount and level of solutions suggested by customers
		Customers' complaints about product defects	Amount and sphere of reclamations
		Quality of feedback with product designers	Speed of implementation of changes to product after customers' appeal
6	Reconnaissance of probable new zones for product application	New ideas about product application	Number and level of ideas
		New ideas about new segments for product	Number and perspective of new segments
7	Reconnaissance and search for information about products of competitors	Revealing of competitors' products advantages	Number and quality of solutions revealed in competitors' products
		Revealing of competitors' products disadvantages	Number and quality of disadvantages revealed in competitors' products
		Revealing of competitors' service advantages	Number and quality of solutions revealed in competitors' service products

- to increase company's income;
- to provide feedback for product designers;
- reconnaissance of probable new zones for product application;
- reconnaissance and search for information about products of competitors.

In our opinion, service goals can be subdivided into technical, economic, organizational, socio-psychological and others (table 1).

Wide range of goals allows providing balanced, complex, system and all-round development of organization. Each of the goals is responsible for its own area of organization development, which allows working for short and long perspective, working for solution of existing problems, as well as performing proactive operations to prevent problems in future. Of separate significance are the goals aimed at provision of customers' loyalty and the goals oriented on

deep reconnaissance of technical, economic and social future trends. This provides careful consideration and accounting of dynamics of development, friendly and counteracting systems.

3. Results and discussion

For the purpose of service goals and methods of their achievement management one can use various approaches. At that the process of goal achievement can be imposed with different limitations, which do not allow applying this or that method or significantly influencing the speed of goal achievement.

The important factor is the choice of interaction between such elements as goal, limitations and methods. In our opinion, there can be three models of their interaction:

Goal - limitations - method;

Limitations - goal - method;

Goal - method - limitations.

Within the framework of the first method, the Walt Disney's method, designers first determine goal of service out of any limits and suppose there are no limitations in achieving the goal. So, they make pattern of target zones and goal criteria. Then they impose limitations pertaining to internal or external environment. At that there is differentiation of the limitations by the degree of their severity. The severe limitations cannot be avoided by designers due to various reasons, therefore they are accepted as is. On the basis of severe limitations there is correcting of target criteria - up to waiving them in case of impossibility of their achievement. What is for soft limitations - there is search for methods that can overcome the limitations. Thus, there is gradual coordination of goals and limitations between each other due to definite methods.

The second model, the Ilyushin's model, offers initial setting of limitations on the part of external or internal environment. Setting of goals is performed with account of the limitations. This allows accelerating the process of solutions' elaborating with account of existing limitations, however at the same time constricts scale and spectrum of goals that can be set by designers. The next step is the selection of methods for their achievement.

The third approach (goal - method - limitations) is aimed at setting big goals and search for methods of their achievement. In the present case such parameters as effectiveness of methods and presence of limitations are not regarded as of paramount importance. Thus, there is absolute freedom for designers' fantasy, due to which they can step over the bounds of existing rules. And just hereupon designers impose limitations, which can cut off these or those methods of goal achievement. Such setting of task provides preservation of audacious goals, as far as there are methods being a kind of buffer between limitations and goals. These methods take the fall of limitations and can be changed without refusal from goal achievement. In authors' opinion, the third approach is the most adequate under conditions of external environment dynamism, since it allows extending the range of taking decisions and seeking for the most effective zones. It is important to notice that under such an approach one should set really audacious goals, as far as only such goals provide strategic advantage. To set such goals one can use technology of ideal end result. The essence of the technology can be expressed by the mere phrase: "Problem RESOLVES ITSELF".

Goals of service determine parameters of product. Therefore we offer applying the technology of ideal end result for determination of service target parameters. At the present time one of actively manifesting law of technical systems development is the law called "Exception of man from system". That is why we consider that effective service requires carrying out of a number of ideal end result principles. Among them there are:

- equipment ITSELF monitors mode and operating conditions;

- equipment ITSELF diagnoses the reason for break down;

- equipment ITSELF informs operator and service department.

Therefore, authors have offered to set a goal of extra-high level - equipment SHOULD CONDUCT SELF-REPAIR in case of break down.

There is a system of service goals hierarchy by Khusainov:

The highest level - as an ideal variant, equipment should conduct SELF-REPAIR in case of break down;

High level - equipment ITSELF diagnoses the reason for break down;

Middle level - equipment ITSELF informs operator and service department about the fact of break down;

Low level - equipment ITSELF register the fact of break down.

Table 2 determines service equilibrium point, in which there is maximum benefit.

Table 2
Determination of service equilibrium point

Service level	Expenses for manufacturer	Profit for manufacturer	Expenses for consumer	Profit for consumer
Top	High	Very high	Very high	High
High	Middle	High	High	Middle
Middle	Low	Middle	Middle	Low
Low	Low	Ultra-low due to loyalty drop	Middle	Low

Service parameters are influenced by a number of limitations presented in table 3.

Table 3
Limitations having impact on service parameters

Limitation type	Manufacturer	Customer
Economic	Required profit rate, current level of expenses, market price for services	Creditworthiness, cost for service
Time	Availability of time resources for meeting consumers' needs	Amount of time, during which consumer is ready to await problem solution
Technical	Conformity of enginery to the modern requirements, availability of required amount of equipment	Bear no relation to customer
Technological	Conformity of applied technologies to the modern level	Bear no relation to customer
Psychological	Degree of motivation and customer centricity of employees	Level of requirements to service, minimum accepted level of service

Personnel and qualification	Qualification and number of employees working in service	Minimum accepted level of qualification and culture of employees involved to service
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On the basis of these requirements one can form target indicators for enterprise products' service and monitor according to them how effectively or non-effectively service departments of enterprise work (Table 4).

Table 4
Methods of achieving target criteria of service

Target achieving method	Advantages	Disadvantages
Ikea method	Initial orientation on technical simplicity and functionality of product. Consumer can personally perform assembling and disassembling of product	High price of branded service. Focus on extra-feasibility of product has negative impact on its aesthetics
LEGO - Volkswagen method	High unification of separate elements of product, standardization provides high speed and simplicity of meeting wide range of requirements of various segments of consumers	Reduction of product uniqueness level, loss of exclusiveness factor for consumers and, subsequently, drop of consumers' interest
Application of target costs concept	Orientation on purchasing power of target group of customers. Activation of creative thinking of company's employees due to severe limitations and high goals	Excessively severe limitations can result in keen simplification and reduction of effectiveness of taking technical, economic and organizational decisions
Application of full circle concept	Determination of expenses for service, possibility of forecasting and planning own expenses for customers	Reduction of flexibility of responding to change of expenses level within the period of product use
Application of costs transparency concept	Increase of level of customers' credibility and loyalty, growth of level of foundation of customer's expenses and company's responsibility for taking decisions	Increase of error cost, complexity of such service process management, susceptibility to price and other attacks on the part of competitors, tax services, etc.
Project management methods	Possibility of guaranteed observance of service terms, customers' understanding of situation on criteria of terms, quality and expenses	Difficulty of service management under conditions of high uncertainty and significant changes
Queues theory	Possibility of forecasting and controlling customer flows on the basis of elaborated algorithms	Necessity of high qualification and strict observance of algorithms

Orders and reserves management methods	Possibility of forecasting and controlling demands and reserves on the basis of elaborated algorithms	Necessity of high qualification and strict observance of algorithms. Necessity of accuracy in choosing algorithms
Methods of transportation, stocking logistics, JIT method	Possibility of increasing level of service, working processes' organization and orderliness	Reduction of flexibility of managerial mechanisms, difficulty of work under conditions of chaos
Methods of scientific management of labour	Possibility of fast reduction of superfluous spending of resources, time and finances for solution of simple tasks	Difficulty of choosing adequate instruments for definite situation. Probable deterioration of psychic atmosphere within organization
Conflicts management methods, negotiating	Possibility of turning negative factors to useful or neutral ones	Requires high level of employees' emotional maturity
Methods of increasing value for customer	Possibility of goal-oriented management of service parameters having the biggest significance for customer. Possibility of taking additional profit	High speed of obsolescence of values, difficulty in maintaining set level of customers' satisfaction
Customers service methods	Possibility of intelligent use of emotional factors and, subsequently, growth of customers' loyalty	High degree of dependence of company on employees differed with emotional maturity
Methods of attraction of customers and increase of their loyalty	High degree of determinancy of customer base and expected financial flows	Probable reduction of creative motivation and deterioration of goal-setting system quality due to the necessity of superfluous meeting of ungrounded needs of consumers

4. Conclusions

As the result of research author have found that for setting service goals one can use three models bracing together goal, methods and limitations. Difference between these models consists in sequence of solving tasks on goals setting, choice of methods and determination of limitations. Authors consider the model "Goal - Methods - Limitations" is the most adequate and appropriate under conditions of dynamic environment. Strengthening of the model with ideal end result technology allows setting really great goals extending beyond existing possibilities of equipment and technologies. Application of the model provides strategic advantage for companies due to development and realization of preventive solutions aimed at future changes in economy, enginery and consumers' psychology.

Besides, authors suggest subdividing service goals into four groups: technical, economic, organizational and socio-psychological. This allows taking into account various aspects and levers of service as an instrument of company's competitive advantages under conditions of tough struggle for customer. Integration of these goals into enterprise's activity is performed

through the development of target criteria and indicators, which allows effective measuring goals and conducting their coordination between each other, and also control for achieving service goals. It has been found that on the basis of determination of service goals one can determine requirements to design and technological features of product. This allows providing feedback between parameters of service and parameters of the very product, as well as facilitates elaboration of goals for products designers and the system of their production.

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Revista ESPACIOS. ISSN 0798 1015
Vol. 39 (Nº 04) Año 2018

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