

# Identification of the model elements for evaluating the management activities of an industrial enterprise based on KPI specification

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**Abstract.** This article summarizes modern methods of evaluating the marketing activities of an industrial enterprise and on this basis, identifies the possibilities of using the concept of a balanced scorecard for a comprehensive assessment and its results. These elements serve as the basis for drawing up a model for assessing the management activities of an industrial enterprise. In the study of the relationship between the prospects of the MBSC and the prospects of the key indicators of achievement, it was determined that the marketing mix should include four marketing sub-mixes (product mix, contract mix, communication mix, distribution mix). Each sub-mix is a key indicators of achievement perspective. As a result of these studies, on the basis of prospects, their optimal ratio was found to solve a specific tactical or strategic task of developing the key indicators of achievement. This topic is relevant, since marketing is the most difficult to manage area of the enterprise and therefore it is necessary to use various models and methods for assessing the effectiveness of various factors that help identify diverse problems and coordinate movement towards goals.

## 1. Introduction

One of the most important steps to the formation of the marketing component of the industrial enterprise balanced performance system should be the development of key performance indicators (KPI) for the enterprise marketing service.

In accordance with the methodological recommendations of A. Preisner, two approaches can be used to track the results of marketing activities. Firstly, the top-down method, in which the prospects for a corporate-wide balanced scorecards (BSs) are copied and transferred to the marketing level. This path is somewhat conservative, since using it we can hardly change the original concept and follow it exactly, the author emphasizes. However, the methodical accuracy of this method leaves open the question of how realistic it is to take into account all the features of marketing.

Secondly, the “natural” way, according to which, first of all, it is necessary to determine when marketing, is in its “state of harmony”. Necessary prospects are determined on the basis of success factors identified in the analysis of the external environment and the company's own experience. In the



end, each enterprise finds its own way of solving the problem, therefore, it is impossible to propose a single scheme for all.

## 2. KPI Prospects

The development and adoption of marketing decisions in the enterprise system is based on taking into account the differences and commonality of the concepts of marketing as a philosophy, a way of organizing the company activities, and as a tool that affects the exchange process that the subjects of this system enter into and continuously interact with. Marketing theory requires an integrated application of these three aspects of marketing understanding [1].

This approach allows you to define marketing as a set of ideas that should be a single entity in the enterprise and which must be managed. However, knowledge of the marketing philosophy, the ability to manage business ideas may not be sufficient to organize effective marketing activities. Tools are also needed, that is, a set of methods, methods by which it would be possible to influence buyers and other subjects of the marketing system to achieve the set goals. Such a tool is a marketing mix. The marketing mix was called the “4P” method (model): product; price; distribution; promotion [2].

Despite the limited application, the 4P model can be used to develop the KPI enterprise marketing service. In this case, the marketing mix should include four marketing sub-mixes. These are: commodity mix; contractual mix; communicative mix; distribution mix. Varying the factors (tools) of the marketing mix allows us to find the optimal ratio for solving a specific tactical or strategic task of developing KPI [3].

All the elements presented in the aggregate and interconnectedness represent nothing more than a model for assessing the effectiveness of the management activities of an industrial enterprise. Each submix is a KPI perspective, which includes an independent set of measures, the implementation of which forms the appropriate policy for tracking the results of the company's marketing services activities.

For the marketing department of CJSC “Kultbystroy”, it is recommended to use five perspectives: “commodity mix”; “Contract mix”; “Distribution mix”; “Communicative mix”; “Performance”. For every KPI prospect, key success factors must be identified. Each key success factor is associated with the personal employee goals. Objectives describe the specific results that need to be achieved [4].

For each of the prospects, based on the key success factors and personal goals of the given employee, it is recommended to form a set of performance indicators and performance indicators for each employee of the marketing department in the form of a set of financial and non-financial performance indicators, with the help of which a quantitative and qualitative assessment of the degree of planned activities implementation by the employee is carried out and his or her contribution to the success of the marketing activities of the enterprise as a whole [5, 6].

## 3. Commodity mix perspective indicator group

Profit from new types of goods ( $P_N$ ). The indicator is calculated based on the sales volume of new goods types ( $V_N$ ) and total costs for these goods ( $E_N$ ):

$$P_N = V_N + E_N, \quad (1)$$

$$E_N = C_{pr} + C_d. \quad (2)$$

where:  $C_{pr}$  is the cost of producing new types of goods,  $C_d$  is development costs of new goods types.

Sales of new goods types  $V_s$ . The indicator can be defined as the number of new types of sold goods ( $Q_N$ ) or as a multiplication of the number of sold new goods types ( $Q_N$ ) by unit price of a new product ( $P_{Un.N.En}$ ):

$$V_s = Q_N * P_{N.En}. \quad (3)$$

Number of consumers ( $Q_c$ ) is the number of enterprises buying products of “Kultbystroy”.

#### 4. Contract mix perspective indicator group

The cost of servicing one consumer ( $C_{CS}$ ) is a total cost, which may include all costs of the enterprise servicing consumers: advertising costs, sales promotion activities (for example, participation in special exhibitions), business trips, transportation and other expenses [7]. Hence, the cost of servicing one consumer ( $C_{CS}$ ) can be calculated as the ratio of the total cost of customer service ( $C_{tcs}$ ) to the total number of enterprise consumers ( $K_n$ ):

$$C_{CS} = \frac{C_{tcs}}{Q_c}. \quad (4)$$

Price level versus industry average ( $L_p$ ) can be defined as the ratio of the enterprise unit price ( $P_{Un.En}$ ) to the industry average unit price of a similar product ( $P_{Un.In}$ ):

$$L_p = \frac{P_{Un.En}}{P_{Un.In}}. \quad (5)$$

Number of complaints is determined by counting the number of consumer complaints with claims regarding product defects.

#### 5. Distribution mix perspective indicator group

The share of lost consumers ( $S_{LC}$ ) - The indicator can be defined as the ratio of the number of lost consumers ( $Q_{LC}$ ) to the total number of customers in the enterprise ( $Q_c$ ):

$$S_{LC} = \frac{Q_{LC}}{Q_c}. \quad (6)$$

The value of the indicator is determined for the year, that is, if the consumer has not made a single order for products during the year, then it is considered lost for the enterprise. Re-purchase share ( $S_{RP}$ ) - this indicator is determined by the ratio of the number of repeated orders ( $Q_{RO}$ ) to the total the number of orders of the enterprise ( $Q_O$ ):

$$S_{RP} = \frac{Q_{RO}}{Q_O}. \quad (7)$$

The number of new markets. For a new market, a city, region or region may be taken in which the company's products were not previously presented, but are currently presented. The value of the indicator is determined by a simple calculation of the "developed" territories for a certain period of time (for example, for one year) [8].

#### 6. Communicative mix perspective indicator group

Customer Satisfaction ( $S_c$ ) is an indicator, that can be calculated as the ratio of the buyer number who were satisfied with the purchased goods or who accompanied the purchase of the service ( $Q_{s.p}$ ), to the total number of company's products buyers ( $Q_c$ ):

$$S_c = \frac{Q_{s.p}}{Q_c}. \quad (8)$$

Also, the indicator can be defined as the number of customers who expressed extreme satisfaction with the purchased products and services in a special study ( $Q_{s.st}$ ). Share of regular customers ( $S_{rc}$ ) is an indicator, which can be defined as the ratio of the number of regular customers ( $N_{rc}$ ) to the total number of enterprise customers ( $Q_c$ ):

$$S_{rc} = \frac{N_{rc}}{Q_c}. \quad (9)$$

A consumer is considered to be a regular customer who orders products every month.

The share of new consumers ( $S_{nc}$ ) is an indicator, that can be determined by the ratio of the new consumer number (consumers who have not previously purchased the company's products, ( $N_{nc}$ ) to the total number of consumers of the company's products ( $Q_c$ ):

$$S_{nc} = \frac{N_{nc}}{Q_c}. \quad (10)$$

### 7. Performance perspective indicators group

Annual sales per customer ( $V_{cs}$ ). This indicator is determined by a simple calculation of the quantity of products purchased by each consumer, which is noted in a special journal [9]. The average indicator can be calculated as the ratio of the organization annual sales ( $V_s$ ) to the total number of company consumers ( $Q_c$ ):

$$V_{cs} = \frac{V_s}{Q_c}. \quad (11)$$

Market share ( $M_s$ ). This indicator can be calculated as the ratio of the sales volume of a given product of a certain company ( $V_s$ ) to the total sales of similar products in the market ( $V_{sc}$ ):

$$M_s = \frac{V_s}{V_{sc}}. \quad (12)$$

Marketing expenses. The following expenses may be included in the amount of marketing expenses: advertising; business trips; fare; expenses for postal, telephone services, etc. The value of this indicator is calculated every month.

It is possible to calculate many more other indicators of the effectiveness and efficiency of the marketing service. However, using too many indicators should be avoided in order to prevent their incorrect combination, excessive workload of the DPRK and, therefore, the complexity of working with this system [10]. For each performance indicator, a specific (target) value is set, which must be achieved. This value depends on how high the status of the employee in the enterprise.

Performance indicators and target values must comply with the rule system known as SMART. In accordance with this system, indicators should be: specific; measurable; achievable (achievable); result-oriented (result-oriented); tied to time (time-specific).

At the end of the planning period, an assessment is made in percentage terms of the effectiveness of the marketing activities of each employee of the marketing service of the enterprise. This can be done by calculating the final coefficient of the DPRK. To do this, according to previously proposed indicators, the operational goals of the marketing employee are selected, which are ranked in terms of their importance to the enterprise.

Then the level of achievement of this goal is determined. The scale format in this case is selected from 1 to 3 (the goal is not realized ... the goal is realized). Next, weighted estimates for each goal are calculated as the product of importance and the level of achievement [11]. The sum of the works in each direction is divided by the maximum possible estimate. The obtained value in percent characterizes the degree of realization of the DPRK perspective; the final coefficient characterizes the degree of marketing service goals implementation.

$$T_r = \frac{\sum_{i=1}^n a_i * b_i}{\sum_{i=1}^n a_i * b_{max}} * 100\%, \quad (13)$$

where:  $T_r$  - KPI final coefficient characterizing the degree of marketing employee potential realization;  $n$  - the number of performance indicators and employee performance for each run;  $a_i$  - priority level of indicator of the effectiveness and efficiency of the employee for each perspective;  $b_j$  - expert assessment of the degree to which the employee reaches the target values of performance indicators and employee performance for each prospect (points);  $b_{max} = 3$  - the maximum possible degree of achievement by the employee of the performance indicators target values and the effectiveness of the employee's activity for each prospect (points) [12].

As an example, consider the methodology for the formation and implementation of KPI for the head of the enterprise marketing department [13].

In accordance with the table 1, it can be concluded that the head of the marketing department realized the potential in the framework of the "Product mix" perspective (100.0%) to the greatest extent. The

least implemented indicators are the Perspective “Performance” (50%). The total KPI is 83.3%. Analysis should be carried out for the entire marketing department of the enterprise.

**Table 1.** Calculation of KPI for the head of the marketing department of JSC “Kultbystroy”.

KPI perspective	Performance indicators and employee performance and their target values	Priority level, $a_i$	The degree of implementation (from 1 to 3 points)		Integral evaluation		Highest possible rating	Degree of implementation
			Rating ( $b_i$ )	Max, $b_{max}$	Rating $a_i * b_i$	Total, $\sum a_i * b_i$		
Commodity mix	Increase the number of consumers	6	3	3	18		18	
	Increase profits from new types of goods to 12%	3	3	3	9	33	9	33 (100%)
	Increase sales of new types of goods to 12%	2	3	3	6		6	
Negotiated mix	Reduce the cost of servicing 1 consumer by 10%	2	2	3	4		6	
	Ensure the price level for products is 10% lower in relation to the industry average	1	3	3	3	9	3	12 (75%)
	Reduce the number of complaints to 3-4 pcs./month	1	2	3	2		3	
Distribution mix	Reduce the share of lost consumers to 3%	4	2	3	8		12	
	Increase repeat purchases to 80%	3	3	3	9	26	9	30 (80.7%)
	Increase the number of new markets by 15%	3	3	3	9		9	
Communicative mix	Reduce the share of unsatisfied consumers to 3% of transactions	4	3	3	12		12	
	Increase the share of regular customers to 40%	5	2	3	10	28	15	33 (84.8%)
	Increase the share of new consumers by 60%	2	3	3	6		6	
Performance	Increase market share to 18%	4	1	3	4		12	
	Increase annual volume sales for 1 consumer up to 35 t.r./month	1	2	3	2	9	3	18 (50%)
		1	3	3	3		3	

## 8. Conclusion

In this article, the relationship between the prospects of MBSC and the prospects of KPI was presented and studied in detail. 5 prospects were selected, namely the “Commodity mix”; “Contract mix”; “Distribution mix”; “Communicative mix”; “Performance”, and for each prospect, key success factors were defined. A set of general performance indicators and performance indicators for each employee of the marketing department was formed in the form of a set of financial and non-financial performance indicators, which are elements of a model for evaluating the management performance of an industrial enterprise.

The KPI system was finally developed as a marketing component of a balanced scorecard in CJSC “Kultbystroy”, which allows MBSC to determine the degree of success in realizing the potential of the marketing complex based on the calculation of the integral performance indicator.

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