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# Modeling the assessment of the industrial enterprise performance with a balanced scorecard

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**Abstract.** This article proposes a techniques package for the development and use of a balanced scorecard to assess the industrial enterprise management activities effectiveness. These methods allow us to create a system model for evaluating the effectiveness of enterprise management activities. Since effective management activity is one of the most important elements for the successful functioning of any enterprise, its important business process, the importance of evaluating such activities is beyond doubt. At the end of the planning period, an assessment is made in percentage terms of the marketing activities effectiveness of each enterprise marketing service employee. For these purposes, the final coefficient of key performance indicators is calculated. Using a rating scale, we evaluated the effectiveness of marketing management of an industrial enterprise using the concept of a balanced scorecard. The following indicators were identified as elements of the FAROUT scale: future orientation, accuracy, resource efficiency, objectivity, usefulness and timeliness. These indicators are the basis for evaluating marketing activities. The relevance of this study is based on the fact that using various methods of evaluating marketing activities; you can adapt to market changes and choose the optimal development strategy.

## 1. Introduction

To assess the industrial enterprise marketing activities effectiveness using the concept of a balanced scorecard, it is proposed to use a rating score based on the FAROUT system [1].

The FAROUT system is based on the premise that the results of the assessment must be reasonable and, therefore, valuable to those who make marketing decisions. In addition, it should have several common characteristics [2, 3]. These are:

- Future orientation. Information on marketing activities should be perspective-oriented, deeply and broadly aimed at an uncertain future, with the ability to withstand risk. Therefore, in the process of marketing activities effectiveness evaluating, it is necessary to use analytical methods that will be oriented to the future and not to the past [4].
- Accuracy. The marketer must obtain results that are distinguished by a high degree of accuracy. A high degree of accuracy is difficult to achieve for several simple reasons, such as, for example, when the data preceding the analysis, taken from one source, did not cross-reconcile with stable and slowly developing information, should be transferred from some sources in ways that they



were not originally created and come from sources characterized by a high degree of prejudice [4].

- **Resource efficiency.** For the result to be desirable, the data should come from sources that require not only lower costs than the value of the results, but its collection should not take too much time, no more than what a decision actually requires. When the data used for analysis comes from primary sources (that is, most of the information provided by people), they affect the possible level of analytical accuracy. It also requires great skill and understanding of what was really required from the primary sources. However, many secondary data sources can provide high accuracy and timeliness, but are not future-oriented, which can also be costly [5].
- **Objectivity.** Often too many good analyzes are covered by prejudices of consciousness or social prejudices, starting from the prejudice of the a priori hypothesis, group thinking and ending with comfort when solving problems in conditions of risk and uncertainty. To minimize the potentially destructive nature of these common prejudices, the findings should be reviewed and analyzed using a rational and systematic approach. Successful analysis reduces the destructive potential of analytical and decision-oriented biases [6, 7].
- **Usefulness.** The results obtained should correspond to the basic information needs of the decision maker in his specific context. A valuable analytical result should be consistent with the responsibilities of the decision maker, organizational context and style of interpretation. For the analyst, this is the key to developing results that “need to know” rather than “good to know”, and which correspond or partially coincide with the basic information needs of clients.
- **Timeliness.** How much time the analysis takes from the marketer will either interfere with or help the use of information. Most marketing information or competitive data has limited “shelf life”, especially where these decisions are made in dynamic, hyper-competitive, or turbulent environments. Information loses its value, the longer it remains excluded from decisions that predetermine organizational actions. Certain analysis methods may provide the necessary information, but take too much development time. On the other hand, other methods of analysis may require a little time, but do not show the required signs of objectivity, accuracy, usefulness and resource efficiency. Cost analysis will provide enough time for the organization to implement the course of action recommended by the analysis. Inconsistency with all of these criteria will be reflected in the fact that the results of the analysis will have less value for marketing decision makers [8, 9].

## 2. FAROUT scale elements

When exploring the FAROUT system, they usually use a five-point rating scale. Levels of a five-point scale are presented from low (1) to high (5) (table 1).

In accordance with table 1, the assessment is oriented from the present to the future; it is accurate, resource-efficient, objective, useful and timely.

Undoubtedly, compromises between the six FAROUT elements will be required to achieve an optimal assessment.

Using the scale of the FAROUT system, we evaluated the effectiveness of the industrial enterprise marketing management using the concept of a balanced scorecard. A summary of the rating is presented in table 2. In accordance with table 2, the following results were obtained [10-12].

**Table 1.** FAROUT scale.

FAROUT scale elements	Characteristic
Future oriented	A score of 1 corresponds to the fact that the result of the model exhibits a low level of future orientation, while 5-points score reflects the fact that the model is well oriented to the future.
Accuracy	A score of 1 reflects a low level of accuracy for this model, taking into account possible data sources. A score of 5 indicates that the level of accuracy has increased significantly in accordance with the requirements for this model.
Resource efficiency	A score of 1 means that this model requires a large amount of resources (financial, human, informational, etc.) and is characterized by a low level of effectiveness. A score of 5 indicates that this analytical method is highly efficient in the use of resources and the proposed results.
Objectivity	A score of 1 means that a particular tool was not highly effective, often due to the existence of prejudices and different opinions. A score of 5, on the other hand, means that the bias potential can be minimized.
Utility	The usefulness of a particular tool is based on the strategic results that the tool can provide. A model rated at 5 points provides a high level of assessed results, and a model rated at 1 point provides a low level of assessed results.
Timeliness	A score of 5 indicates that a particular model requires little time for analysis compared with a score of 1, which shows that this analysis method requires very little time to complete it effectively.

**Table 2.** Balanced scorecard.

FAROUT scale elements	Rating, points				
	1	2	3	4	5
Future oriented	Rating <sub>11</sub>	Rating <sub>12</sub>	Rating <sub>13</sub>	Rating <sub>14</sub>	Rating <sub>15</sub>
Accuracy	Rating <sub>21</sub>	Rating <sub>22</sub>	Rating <sub>23</sub>	Rating <sub>24</sub>	Rating <sub>25</sub>
Resource efficiency	Rating <sub>31</sub>	Rating <sub>32</sub>	Rating <sub>33</sub>	Rating <sub>34</sub>	Rating <sub>35</sub>
Objectivity	Rating <sub>41</sub>	Rating <sub>42</sub>	Rating <sub>43</sub>	Rating <sub>44</sub>	Rating <sub>45</sub>
Utility	Rating <sub>51</sub>	Rating <sub>52</sub>	Rating <sub>53</sub>	Rating <sub>54</sub>	Rating <sub>55</sub>
Timeliness	Rating <sub>61</sub>	Rating <sub>62</sub>	Rating <sub>63</sub>	Rating <sub>64</sub>	Rating <sub>65</sub>

### 3. Characteristic indicators

According to the “Orientation for the Future” indicator, the extent to which the marketing management system of an industrial enterprise using a balanced scorecard is regularly reviewed is determined taking into account changes in factors of the internal and external environment and the achievement of organizational improvements.

The “Accuracy” value indicator makes it possible to determine the mistakes made (errors). Here, cross-checking by independent experts will increase the accuracy of marketing decisions. For “Kultbystroy” accuracy is average.

The “Resource efficiency” indicator varies depending on the degree of participation of independent experts and the availability of internal and external data. For this enterprise, the marketing management system using a balanced scorecard has proven to be effective in terms of resource saving [13].

The indicator “Objectivity” for “Kultbystroy” is in the medium range. The support of independent experts enhances objectivity. It is required to identify “blind” zones and differences of opinion and opinion related to the positions of the enterprise marketing service heads and functional experts in assessing the designed system.

The value of the “Utility” indicator ranges from medium to high. This indicator provides an assessment of the industrial enterprise current situation and its competitiveness.

The value of the indicator “Timeliness” (for the studied enterprise it is medium to high) allows us to judge the relevance of the inclusion of the BS in the marketing management system of the industrial enterprise marketing activity [7].

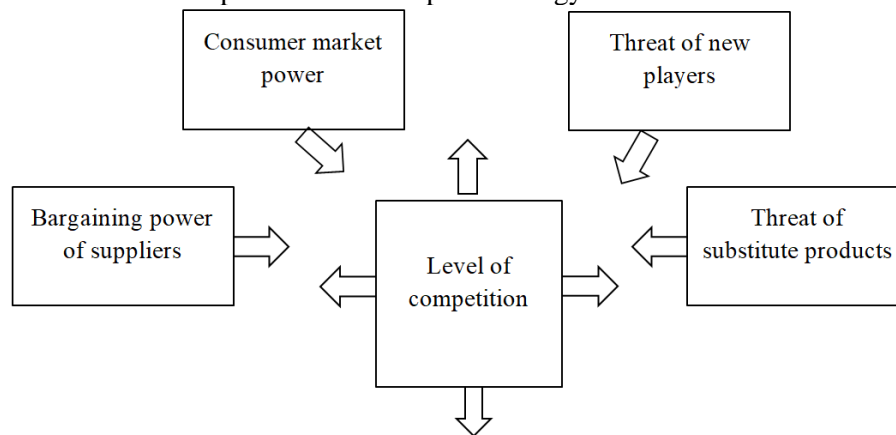
The effectiveness of any organization is largely determined by the functioning of the marketing system. The workers of this system do not directly create products, but, carrying out certain organizational and commercial activities for the production of goods, maintaining its quality, ensuring the commodity infrastructure, is an integral part of the production staff.

There are several definitions of the economic efficiency of marketing activities:

- Relative diverse (at all stages of the marketing process) result that meets the ultimate and intermediate goals of marketing activities.
- Ratio of the effect (result) from conducting marketing activities to all costs accompanying this process.
- Return on costs associated with marketing activities, which can be estimated as the ratio of effect, result, expressed in natural (material or non-material) or cost (price) forms to the cost of all necessary resources (material, technical, labor, etc.) for organization and implementation of marketing activities.

The main task of the manager is to find a field of activity where protection against the action of these competitive forces would be provided and / or an opportunity to use them for their own purposes would appear.

Of the five factors of competition in the industry (figure 1), as a rule, one factor dominates, which becomes decisive in the development of an enterprise strategy.



**Figure 1.** Key success factors for industrial enterprise.

This system helps eliminate the tendency to return to a limited number of tools. It requires the analyst to consider the possibility of using each tool constantly when analysis is needed.

#### 4. Conclusion

As a result, the paper proposes a package of methods for the system formation for evaluating the marketing activity of an industrial enterprise based on a balanced scorecard, as an element of the production business process management of an industrial enterprise including a methodological rationale for the development and implementation of a indicators balanced system for marketing activity of an industrial enterprise, a methodology for developing a balanced system of indicators for industrial enterprise marketing activity, a methodology for developing key indicators of achievement for marketing employee.

In addition, the advantages of managing the enterprise marketing activities using the concept of a balanced scorecard, which are focused on the future, accuracy, resource efficiency, objectivity, usefulness and timeliness, are substantiated.

## References

- [1] Solovyova Y N 2006 *Theory and Methodology of Providing Marketing Competence in the System of Managing Strategic Alliance* (Saint-Petersburg: SPbSUEF)
- [2] Raven D 2002 *Competence of Modern Society: Revealing, Development and Implementation* (Moscow: Cognito center)
- [3] Tynchenko V S, Fedorova N V, Kukartsev V V, Boyko A A, Stupina A A and Danilchenko Y V 2019 Methods of developing a competitive strategy of the agricultural enterprise *IOP Conference Series: Earth and Environmental Science* **315(2)** 022105
- [4] Kukartsev A V, Boyko A A, Kukartsev V V, Tynchenko V S, Bukhtoyarov V V and Tynchenko S V 2019 Methods of business processes competitiveness increasing of the rocket and space industry enterprise *IOP Conference Series: Materials Science and Engineering* **537(4)** 042009
- [5] Kaplan R S and Norton D P 2004 *The Balanced Scorecard. From a Strategy to an Action* (Moscow: Olymp Business)
- [6] Kaplan R S and Norton D *An Organization Oriented to a Strategy. How Organizations Using a Balanced Scorecard Succeed in the New Business Area* (Moscow: Olymp Business)
- [7] Meyer M V 2004 *Business Performance Estimates* (Moscow: Peak)
- [8] Chzhan E A, Tynchenko V S, Kukartsev V V, Fedorova N V, Yamshchikov A S and Krivov D A 2019 Essence and classification of the agribusiness organizations competitive strategies *IOP Conference Series: Earth and Environmental Science* **315(2)** 022106
- [9] Brown M G *The Balanced Scorecard: in the Implementation Way* (Moscow: Alpina business books)
- [10] Niven P R 2003 *The Balanced Scorecard step by Step: Maximum Increasing Efficiency and Fixing the Result* (Dnepropetrovsk: The balance club)
- [11] Nili A, Adame K and Cennerley M 2003 *The Efficiency Prism* (Dnepropetrovsk: The balance club)
- [12] Olven G, Petreyk Y, Roye G and Roye S 2005 *The Balance between Strategy and Control* (Saint Petersburg)
- [13] Praysner A 2007 *The Balanced Scorecard in the Marketing and Sales* (Moscow: Grebennikov publishing house)