

# Development of the identifier system of indicators for improving the information potential of the holding

E V Dolzhenkova<sup>1,2</sup> and L V Iurieva<sup>1</sup>

<sup>1</sup> Ural Federal University named after the First President of Russia B N Yeltsin, Nizhniy Tagil Technological Institute, 59, Krasnogvardeyskaya str., Nizhniy Tagil, 622000, Russia

E-mail: <sup>2</sup>lenag1981@mail.ru

**Abstract.** The article presents the system of competitively-balanced indicators, which makes it possible to assess different spheres of activity of industrial enterprises of the holding for the purpose of improving its information potential. In order to manage metallurgical holding activities, it is proposed to combine accounting and analytical procedures used for strategic decision-making aimed at information potential increasing. For this purpose, the authors' identifier system of indicators includes three blocks: strategic, operational and tactical. When classifying indicators according to the management levels, the following points are taken into account: preliminary analysis of the structural elements in each indicator, consideration of triggers, need for expert assessment. Basing on values dynamics, the results of the calculations make it possible to identify positive trends for some enterprises and negative trends for other enterprises of the holding. They also help to determine the reasons for the increase or decrease of the integral evaluation of one metallurgical enterprise compared to another. All these increases the efficiency of strategic decision-making in the holding management. Besides, the proposed model gives the possibility for determining the assumptions for its implementation in each metallurgical enterprise, thereby increasing the information potential of the entire holding.

## 1. Introduction

The relevance of effective strategic decision-making by the management of metallurgical holdings under conditions of high uncertainty is closely related to the information preparation of data for this purpose. Modern digital economy requires the creation of such an accounting and analytical model that can satisfy the growing information demands of the management system. Such a model is to correspond with the development strategy of the metallurgical holding enterprise on the one hand, and, to be its information potential on the other hand.

Many foreign and Russian scientists were engaged in strategic management, its evaluation and analysis. Scientific works [1, 2] explore innovative strategies. The authors propose innovative strategies with specific product innovation packages. They believe that a stronger focus on product characteristics and improved market access encourage the efficient replication of existing capabilities of an enterprise with immediate benefits.

Empirical studies on the evaluation of the effectiveness of organizations management are the subject of scientific works [3, 4], where the authors show the evidence that financial indicators are a critical problem in its evaluation. Scientists reviewed the mechanisms for managing the efficiency of management strategic initiatives based on the analysis of critical sales processes in the metallurgical business [4].



Entrepreneurial risks are becoming an important aspect of strategic decision-making in today's circumstances [5–8]. Dynamic and organizational possibilities and their influence on the work of enterprises are investigated in works [9–13].

The main source of corporate efficiency – business process management is discussed in the following papers [7, 14].

The following works [15–18] analyze and evaluate competitive advantages in strategic management. Methods of competitive analysis in modern reality are investigated in such works as [19–23].

The review of these scientific papers made it possible to generalize gained experience and special features of strategic analysis to assess activities of metallurgical enterprises under the circumstances of uncertainties in the milieu. It also permits to note insufficiency of research in the multidimensional analysis of the competitiveness of metallurgical enterprises, as well as the development of a competitive strategic model for the evaluation of metallurgical enterprises activities.

All aforementioned determines the relevance of the topic of this research.

## 2. Research Methods

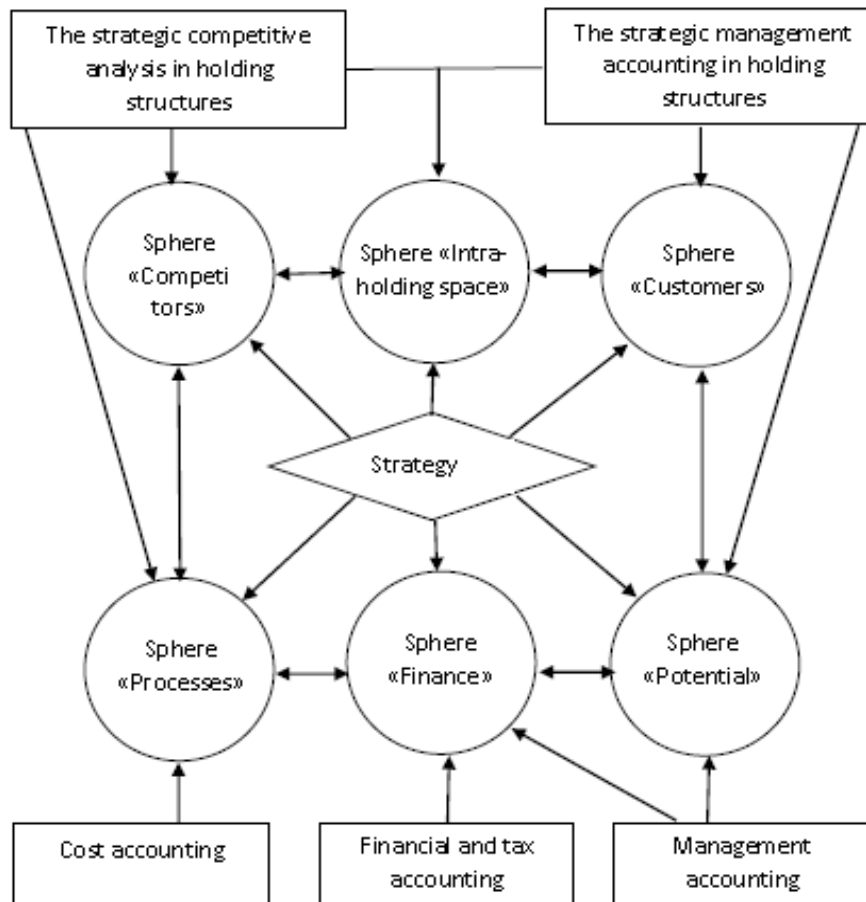
The state of competition in the industry, according to Porter's concept, depends on the influence of five main forces. These competitive forces determine the attractiveness of the industry and the position of the holding in competitive activity. Together, they assess the limiting profit potential of the industry, ranging from substantial to minimal. The pressure of cumulative forces on the metallurgical holding enterprises can be meaningful for all rival parties. To overcome it, the strategy should be based on a careful analysis of the origins of each component. Knowledge of these major sources of competitive pressure provides a stable foundation for a strategic action plan. It will give the possibility to identify the strengths and weaknesses of the holding enterprises, to give a clear justification for the position of the holding in the metallurgical industry. One of the most important indicators of the conditions of competition is the level of intensity in the market, which is determined by several more specific indicators. The most important of them are the profitability of the market, the rate of growth of the market, the type of the market, its volume and the distribution of market shares of competitors, the degree of concentration in the market [4].

Thus, there is a need to develop an identifier system of indicators (hereinafter ISI) in holding structures, which enables the integration of accounting and analytical procedures in order to form and improve the holding strategy for increasing its information potential.

The operation of the ISP is based on strategic management accounting (hereinafter SMA) and strategic competitive analysis in holding structures (hereinafter SCAHS). The outcome of the activity is the establishment of a system of competitively-balanced indicators (hereinafter SCBI) covering the main areas of holding activity.

When developing the SCBI for the metallurgical holding enterprises, factors relating to the static (in short-term period) strategic context and the dynamic (in short-term period) system of objectives should be assessed. At the same time, the ISI itself in the work of the holding structures forms a space in which the objectives are formulated and the SCBI is developed for each enterprise of the metallurgical holding.

According to requirements of the SCBI information provision, the information sources should be useful, relevant, timely, actual and comparable. The authors' model analyses the holding's activities in six key areas. Figure 1 shows the motion of information flows in the SCBI. Special role is assigned for SMA and SCAHS. From these analyses, information about competitors and intra-holding space can be derived.



**Figure 1.** The motion of information flows in the SCBI.

When constructing a system of competitively-balanced indicators of ISI for a metallurgical holding, it is firstly recommended to classify such indicators according to the stages of milieu analysis noted in Figure 2 (1st indicator group is strategic bloc, 2nd indicator group is operational bloc, 3rd indicator group is tactical bloc). In addition, the classification should take into account the importance of the indicator for the management decisions of the metallurgical holding, which is compiled based on expert assessment.

The strategic bloc of indicators describes the mission and strategic objectives of the holding. With the help of this bloc indicators, it is possible to set the guidelines and focus in the activities of the holding enterprises for the next 4–5 years, which will increase the efficiency of strategic planning.

The operational bloc of indicators is mainly required for operational planning. The indicators of this bloc help to link the strategy of the metallurgical enterprise of the holding with its operational activities.

The tactical bloc of indicators is used only for current activities. These indicators generally reflect private processes and tasks which are managed in the short-term period.

Stages of strategic management of the holding	Stages of environmental analysis		
	Analysis of the external environment of the holding	Analysis of the internal environment of the holding	Analysis of the external environment of the holding enterprises
Holding activity analysis	↓	-->	-->
Planning and strategy development	↓	-->	-->
Implementation of the strategy, control of its implementation and management decisions	↓	-->	↓

**Figure 2.** The main stages of SCBI for ISI.

The following algorithm should be used to construct the three blocks of indicators:

- Analyze the main elements that are involved in the calculation of the indicator.
- Identify key triggers and explore possible ways to influence them.
- Based on the analysis of the impact, take a decision on the relation of the indicator to a certain block.

The authors' ISI classifies the indicators into the following three groups of importance based on expert assessment.

Group 1. This group includes the most significant indicators for the holding strategy. These indicators reflect the general processes taking place in different areas of the SCBI. For the planning and integration of such indicators it is proposed to develop special set of regulations.

Group 2. The indicators for this group reflect private processes. As a rule, these indicators regulate normative values, and their planning and accounting at predetermined intervals are not mandatory. The values of the indicators are given at certain intervals. Such indicators will be taken into consideration in the implementation of the holding strategy only if their values exceed a given interval.

Group 3. This group includes indicators that measure private processes and tasks, as well as duplicate indicators of the first and second groups.

Such analysis will significantly increase the information potential of the holding in strategic decision-making.

### 3. Results and discussion

On the basis of the analysis carried out, the indicators of the different areas of the SCBI have been identified. The SCBI indicators array is defined as a set of different measuring instruments that can be grouped according to the main aspects of the metallurgical holding activities. The presented range of indicators is not final and can be edited at the request of users.

Calculation of indicators is proposed to be made in the following areas: financial management; process management; innovation management; service; intra-holding space; competitiveness.

Each of these areas is characterized by a system of indices and indicators. Indicators describe the qualitative constituent of each SCBI area and indices describe its quantitative constituent. On the basis of the calculated indices it is necessary to make an integral assessment of the impact of each indices area on the competitiveness of the holding enterprise as a whole (see Table 1).

Guided by the proposed model, the authors calculated indices for all spheres of the SCBI at metallurgical enterprises, included into the United Metallurgical Company: Vyksa Metallurgical Plant, Chusovoy Metallurgical Plant and Schelkovo Metallurgical Plant.

**Table 1.** Repair service state indexes.

Index	Importance group
SCBI Sphere	Calculation formula
1. Finance	$I_{integr}^f = \sum_{i=1}^6 I_i^f \cdot d_{ig}$
2. Processes	$I_{integr}^{pr} = \sum_{i=1}^9 I_i^{pr} \cdot d_{ig}$
3. Potential	$I_{integr}^p = \sum_{i=1}^9 I_i^p \cdot d_{ig}$
4. Customers	$I_{integr}^{cu} = \sum_{i=1}^2 I_i^{cu} \cdot d_{ig}$
5. Intra-holding space	$I_{integr}^i = \sum_{i=1}^{16} I_i^i \cdot d_{ig}$
6. Competitors	$I_{integr}^c = \sum_{i=1}^8 I_i^c \cdot d_{ig}$

$d_{ig}$  – Group of the indicators importance influences the significance value of the indicator in the integral assessment according to SCBI spheres of activity: significance value of Group 1 – 0.5, Group 2 – 0.3, Group 3 – 0.2. This ratio was determined on the basis of expert assessments given by the heads of metallurgical enterprises.

The results of the calculation show positive trends in changes of indicator values for some enterprises (e.g. Vyksa Metallurgical Plant, Chusovoy Metallurgical Plant) and negative trends in the indicator values for other enterprises (e.g. Schelkovo Metallurgical Plant). It should be noted that the model was implemented at enterprises with the following assumptions:

- indices were defined only for those areas where information was available;
- the output volumes of iron, steel and metal products in general were taken as the main production of the enterprises.

The results of the calculation suggest that Vyksa Metallurgical Plant is the most competitive. Its calculated indices are higher than those of other enterprises for almost all spheres. In addition, the calculations reveal the reasons for the lag or exceedance of the integral assessment of one enterprise over another, increasing the efficiency of strategic decision-making.

#### 4. Conclusion

Thus, the authors' ISI can be used for strategic decision-making to increase the information potential of the metallurgical holding. Its monitoring is based on the strategic management accounting and competitive analysis. On the basis of dynamics of the ICI values it is possible to identify positive trends for some enterprises and negative trends for other enterprises of the holding. The dynamics of the ICI values also identifies the reasons for the increase or decrease of the integral evaluation of one metallurgical enterprise compared to another. This increases the efficiency of strategic decision-making in holding management.

#### References

- [1] Branzei O and Vertinsky I 2006 *Journal of Business Venturing* **21** (1) pp 75–105

- [2] McKenny A F, Short J C, Ketchen D J, Payne G T and Moss T W 2018 *Strategic Entrepreneurship Journal* **12** (4) pp 504–21
- [3] Carton R B and Hofer C W 2006 *Measuring Organizational Performance: Metrics for Entrepreneurship and Strategic Management Research* p 296
- [4] Rocha C F, Duclos L C, da Veiga C P, dos Santos C B and Neves N A F 2016 *International Business Management* **10** (4) pp 357–69
- [5] Caves R E and Porter M E 1977 *Quarterly Journal of Economics* **91** (2) pp 241–61
- [6] Covin J G and Lumpkin G T 2011 *Entrepreneurship: Theory and Practice* **35** (5) pp 855–72
- [7] Covin J G and Wales W J 2012 *Entrepreneurship: Theory and Practice* **36** (4) pp 677–702
- [8] Shams S M R 2016 *Marketing Intelligence and Planning* **34** (5) pp 671–91
- [9] Henri J-F 2006 *Accounting, Organizations and Society* **31** (6) pp 529–58
- [10] Teece D J, Pisano G and Shuen A 1997 *Strategic Management Journal* **18** (7) pp 509–33
- [11] Andreeva T and Ritala P 2016 *Baltic Journal of Management* **11** (3) pp 238–59
- [12] Barney J 1991 *Journal of Management* **17** (1) pp 99–120
- [13] Fainshmidt S, Pezeshkan A, Lance Frazier M, Nair A and Markowski E 2016 *Journal of Management Studies* **53** (8) pp 1348–80
- [14] Afflerbach P, Bolsinger M and Röglinger M 2016 *Business Research* **9** (2) pp 335–75
- [15] Ansoff I 2015 *New corporate strategy* (Saint Petersburg: Peter Com) p 408
- [16] Gordon Ya 2006 *Target competition* (Moscow: Top) p 368
- [17] Kaplan Robert C 2014 *Strategy-oriented organization* (Moscow: Olympus Business) p 392
- [18] Porter M 2005 *Competitive strategy: a technique for analyzing industries and competitors* (Moscow: Alpina Business Books) p 454
- [19] Blank I A 2013 *Financial strategy of the enterprise* (Kiev: Nika-Center, Elga) p 345
- [20] Iurieva L, Kazakova M and Dolzhenkova E 2015 *Costs management accounting at industrial enterprises in conditions of the innovation economics* (Moscow: RUSCIENCE) p 290
- [21] Koveny M 2004 *Strategic Breakthrough: Technologies for Implementing Corporate Strategy to Life* (Moscow: Alpina Business Books) p 232
- [22] Mintzberg G 2001 *Strategic process* (Saint Petersburg: Peter) p 567
- [23] Rampersad H K 2014 *Individual Balanced Scorecard* (Moscow: Olimp-Business) p 176