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Propose a methodology to implement balanced scorecard for operational appraisal of industrial groups

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Abstract

The value of operation assessment has been specified for organizations and it plays a vital role in most of the organizations. Complexity and frailty of decision making in business makes Strategic management imperative. On the other hand, key operational factors are fiscal and non-fiscal measurement criteria used to identify goal's quality and reflect an organization strategic action. These factors are used to assess the present condition of the company and define suitable solutions to business methods. This study proposes an appropriate methodology in order to design and implement balanced score card (BSC) for operational appraisal of industrial groups. In order to achieve this goal thirteen required steps is proposed and discussed.

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1. Introduction

The complexity and subtlety in business decision will cause strategic management as essential tool for organization.

Managers design the strategic management process for facilitating the efficient condition of institution in the competing environment. However, most of them talk about Lack of effectively implementation of their strategies. The perspective which these managers consider for their organization are clear for themselves but knowledge and understanding of their personnel from this perspective is insignificant and their sympathy and assistance to achieve these goals are more insignificant.

Seniors have been consistently searched to find a way to make sure of the execution of their strategies and then have chosen operation evaluation methods as a tool to execute their strategies. Although measuring the operation is one of the most important and principal elements to progress however, existence of a correct and compatible model appropriate to the environment condition is a more significant factor for measuring operation.

On the other hand, in the present competing and complex environment being aware from all aspects of an organization is vital for managers to take a decision. Operation should be measured and termed appropriately and comprehensively. These measures should not only be accordance with the organization commission and perspective but they should also be covering all aspects of an organization operation. So, for achieving this important factor (evaluating the operation), there is a need to design key operational indicators and consequently a proper methodology to set up required indicators. The goal of this study is to propose a proper methodology to design key operational indicators for industrial groups.

2. Operation Evaluation

The rapid growth of international competitions in the past decade as a result of changes in technology and increase in products variability' caused organizations to feel a necessity in continuous improvement of operation more than ever [4].

Nowadays organizations are using operational measurement to assess, control and improve trading process in order to maintain and develop their computational benefits. Among the managers five duties (planning, organizing, staffing, directing, controlling) controlling requires a lot to measure and evaluate the operation more than all. The general evaluation of an organization operation pays attention not only on activities efficiency, but also requires effective control of organization to reach the long term goals and strategies.

Some criteria which are reflecting the organization strategies need to be chosen in order to establish an operation evaluation system. These criteria can be the present and future key success factors which are in turn stemmed from the organization strategies. Operation evaluation helps the management to control the organization's position and condition. In each moment the common feature of all operation evaluation models is effort to relate operation factors with the organization strategies and long term perspectives.

3. The Key Performance Indicator

Key performance indicators are often used for evaluating the present condition of the organization. Key performance indicators (KPI) are defined based on the organization strategies. Indicators are necessary factors of human essence; they demonstrate the basis of trade, knowledge and progress. In organizations, performance criteria's are imperative instruments of management. Performance indicators cater the information and indication that assist organization get novel insights, make possible to learn, assist in making decision and let to act to develop future performance. Nevertheless, in many government, public segment and non-profit organizations, make the serious mistake to trust that every indicator is helpful [21]. Key features to determine indicators

- Primary definition of business matters requirement
- Having operational goals from business necessities
- Quantitative and qualitative measuring criteria of results and comparing them with the whole set of goals studying the differences and regulating stage phases or resources to fulfill short term goal [3, 5, 9, 22, 26].

4. Balanced Scorecard

There are a lot of strategic control methods and systems purposed at evaluating from strategic management viewpoint [31]. Balanced Scorecard (BSC) is one of the methods facilitating systematic and periodical controls in organization. BSC which enables to convert the vision and strategies of a business in terms of performance factors and thus guarantees establishment of the framework needed for strategic management system, has been proposed by Kaplan and Norton [10, 11]. While the traditional fiscal indicators are significant, BSC recommends that financial metrics are inadequate in clarifying the business performance when they merely contain the information pertained with the issues that carried out in the past. Therefore, Kaplan and Norton recommended BSC model that allows combination of measurements according the past organization actions and the criteria's that will bring future performances [12].

Kaplan and Norton described that organizations need to use Balanced Scorecard to:

- Expound and upgraded vision and strategic orientations
- Corresponding strategic goals and measures across the organization
- Group and person objectives align with the enterprise's vision and strategy
- Connection the strategic goals to long term objectives and yearly resources
- Discovering and balancing strategic innovations
- Accomplish episodic performance reconsiders to study about and develop
- Strategy and acquire response to learn about and develop strategy [28].

The proposed model has four perspectives in performance measurement: financial, customer, internal process and learning and growth perspectives [11]. According to this attitude, in the process of strategic management, not only fiscal aspect but also non fiscal aspect such as customer, internal process and learning and growth is considered. Therefore, BSC works as a strategic management system [11]. In spite of the advantages of Balanced Scorecard, there are some defects on methodological principles of this approach [1, 14, 16]. These defects are in the method to be applied in consolidating BSC viewpoints or the performance criteria's which act as diverse measurement units under each BSC view; the method can be implemented in identifying the contribution which is made by each perspective on the performance [14, 1], the company performance is calculated with a comprehensive quantitative approach by pertaining weights or weight of the performance indicators under each viewpoint and the process [16]. Such discussions have been concentrated in some studies related with the methodological basis of BSC and attempted to propose achievable answers for these debates with the help of multi-criteria decision making techniques [16, 25, 14, 27].

5. Related Work

Balanced Scorecard framework has been employed by Willcocks and Lester [29] to the particular requires of Information Technology asset evaluation in a major European ferry company. Furthermore, in order to aid managers appraise Information Technology investments and the performance of Information System organizations in a comprehensive way, BSC is suggested as a useful model.

Sixty six Australian manufacturing firms have been studied by Hoque and James [6] on their application of nonfinancial measures normally found in discussions of BSC development. They found that within the similar industry, organizational performance is a self-reported appraise relative to peers. Their consequences reveal a noticeably positive association between the practice of typical BSC measures and advanced performance.

Moreover, Malina and Selto [19] have scrutinized the effectiveness of the Balanced Scorecard in communicating strategic reasons and helping as a management control tool in large international manufacturing company. They discovered evidence of an indirect connection between BSC's management control task and improved performance on BSC measures. Besides, managers in their study perceived enhanced performance on the BSC would lead to improved efficiency and productivity.

The context effect of association performance measures into the four aspects of BSC has been studied by [17]. They acquired the BSC aspects have meaning to the decision maker as they prime him or her to find out possible relations among the measures within one type and to react any perceived correlation.

Umashankar and Dutta [28] tried to use the concept of Balanced Scorecard and argue how it can be applied in Indian university. This research based on previous literature and appliance the BSC in university by other researchers proposes this model offer the opportunity to formulate a cascade of indexes, sharing and exploiting a comprehensive and integrated framework for foreign shareholders and for others. In addition, pointed out this is a helpful model that can be adjusted with suitable modifications to the management of schooling in India if it be a school, college, self-governing institution or private organization [28].

These are some example which has been stated by researcher that the Balanced Scorecard is a helpful model which can be applied in organization. Moreover, other researcher which has implemented Balanced Scorecard as a performance evaluation and management system is presented in tabular format.

Table1: Different method for Implementing Balanced Scorecard

Researcher(s)	Purpose of the Research	Implementing Stages
Cui-yun Mao, Qiang Mei, Zhi-qiang Ma[20]	Proposition a new method in order to select the information system for organization	The criteria were determined by using a balanced scorecard. The name of BSC is with the intent to keep score of a set of measures that maintain a balance between short-term and long-term objectives. Using TOPSIS Fuzzy technique for ranking and selection of a number of possible alternatives through measuring Euclidean distances.
Ming-Chang Lee[15]	Performance Evaluation by Using the Analytic Network Process and Balanced Scorecard	Define the BSC aspects. Define the indicator based on each aspect. Using ANP technique for weighting the indicators.
Ihsan Yuksel, Metin Dag deviren [31]	Using the fuzzy analytic Network Process (ANP) and Balanced Scorecard (BSC) for performance evaluation in manufacturing firm in Ankara, Turkey	A vision was determined by the expert team. Strategies required for the achievement of the business Vision was determined. BSC perspectives and performance indicators were defined Using ANP Fuzzy technique for weighting the indicators
Jinting Yang, Yinghui Liu [30]	Implementing Balanced Scorecard by using Fuzzy Analytical Hierarchy process in accounting firm in Handan city Hebei province	Define the BSC aspects Define the indicators based on each aspect Using FAHP technique for weighting the indicators
Asadollah Kordnaeij, Maryam Salmasi, Saeedeh Fruzande [13]	Using Balanced Scorecard for evaluation of strategies implementation in Iranian Insurance Firms (Case Study: Rayan-Saypa)	Specifying BSC aspects Define the measurers for each aspect All the determinants were evaluated with one sample t-tests.
M.D. Nayeri, M.M.Mashhadi, K.Mohajeri [23]	Using Balanced Scorecard for Evaluation Universities strategies in Iranian business schools	Define the BSC aspects. Data for all the perspective is gathered by questionnaire. Using GAHP for rating each aspect.
Peide Liu, Zhengwei Du [18]	Utilizing Balanced Scorecard model for E- commerce enterprise performance assessment based on D_S Theory	Define the BSC aspect. Introduce the indicators based on Balanced Scorecard aspects. Analyzing the data by D_S Theory.
Amy H.I. Lee , Wen-Chin Chen, Ching-Jan Chang [14]	Performance appraisal of IT department in the manufacturing industry in Taiwan by using fuzzy AHP and BSC approach	The BSC concept is applied to define the hierarchy with four major perspectives. Performance indicators are selected for each perspective. Proposed fuzzy AHP (FAHP) approach in order to analyze the data. The weight of each perspective according to calculated weight is determined.

Researcher(s)	Purpose of the Research	Implementing Stages
Barbara Bigliardi and Eleonora Bottani [2]	Performance measurement in the food industry supply chain via Balanced Scorecard	Four dimensions of the BSC has been proposed and introduced as a starting point of the study. A set of KPIs suitable to be adopted in the context of food companies by Delphi Technique is determined. After the interview with experts, they have confirmed the effectiveness of Balanced Scorecard model and indicators that they introduced.
Chris Papenhausen, Walter Einstein [24]	Implementing the Balanced Scorecard at a college of business	Based on the college mission, the BSC strategy map will develop. The next step is the development of a Balanced Scorecard showing multiple goals and measures for each perspective. Finally, the measurer according to the goal and Balanced Scorecard aspects has been defined

6. Stages to Design Balanced Scorecard

This stage will present the methodology relate to design and develop Balanced Scorecard model.

The first step: The formation of work teams

Firstly, a team of senior managers, middle managers, experienced and proficient experts is required to design a Balanced Scorecard model.

The second step: Develop a mission statement, vision and values

With the help of a working team a mission statement which reflects the value and vision of the organization will be developed.

Third step: Compiling strategic objective

Strategies are long-term actions and activities that the organization for achieving their goals will require to execute it.

Forth step: Identifying aspects of the balanced scorecard

The basic model of Balanced Scorecard has been included four aspects therefore; in this research are proposed four aspects as well.

Fifth step: Definition of critical success factors

A set of performance goals which help the organizations to achieve their strategies correctly. Here, through meetings with managers and experts, a list of critical success factors could be defined.

Sixth step: Ranking of critical success factors according to calculated weight

Among the identified critical success factors four critical success factors which have the greatest impact in achieving the strategies are chosen. As previously mentioned, with the help of multi-criteria decision- making techniques such as (I) AHP and (II) TOPSIS Prioritization factors might be done.

- *Principles of Analytical Hierarchy Process Group*

Analytical Hierarchy Process is one of the most comprehensive system is designed to make decisions with multiple criteria because this technique provides to formulate the problem as a hierarchical and also consider various quantitative and qualitative criteria's. This process involved various options in the decision and able to use sensitivity analysis on the following criteria and benchmarks. In addition, facilitated judgments and calculations due to paired comparisons. Also, it shows the compatibility and incompatibility decisions which is one of the advantages of multi criteria decision [15].

- *TOPSIS Method*

TOPSIS (technique for order preference by similarity to an ideal solution) method has been presented [7]. TOPSIS is a multiple criteria method to identify solutions from a finite set of alternatives. The basic principle is that the chosen alternative should have the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution [8].

Seventh step: Ranking of Balanced Scorecard according to calculated weight

According to executives and experts opinion for Balanced Scorecard aspect calculated weight with using AHP technique is assigned for each aspect and they will be ranked according to their weights.

Eighth step: Executive program

In this phase the session will be formed by Experts and members of the strategic management team according to the vision, mission and strategic goals, the executive programs need to be determined.

Ninth step: Selection of indicators

As the targets were determined it is necessary to define and select indicators for sensing and measuring. To define or measuring the index some criteria should be considered. Kaplan and Norton emphasize that not too many indicators in the Balanced Scorecard model introduce [12]; therefore, the most important indexes which have effective role in organization should be selected.

Tenth step: Strategy map

Balanced Scorecard strategy map provides a framework to show how the strategy related to the intangible asset and value creation process.

Eleventh step: Prioritization the indicators by TOPSIS method

In order to prioritize the indicators, comments and attitudes of managers and professionals is needed. Therefore, in order to collect these comments, a questionnaire is designed and it can be analyzed by using TOPSIS method.

Twelfth step: Calculate the percentage of achieving the goal

At this stage, for identifying and calculating the Percentage of achieving goal for each indicator initially, quantitative amounts of each of the indicators in the current and ideal solution is collected and measured.

Thirteenth step: The efficiency and score of performance indicators

In the final step, with the weights obtained for Balanced Scorecard aspects, strategic objectives, indicators and the percentage goal of indicators, performance indicators score are calculated and with comparing the performance between current and ideal levels distance and the gap between these two levels (performance gap) is determined.

Fig. 1 shows the conceptual framework for implementation of BSC in industrial groups.



Fig. 1. The conceptual framework for implementing BSC in industrial groups

Regarding to the problem in organization such as limited resource and organizational capital, the need for better implementation has been realized. Therefore, with studying balance assessment and the advantages of BSC method, it has been found out that it can help to achieve the more efficient and effective results.

As there is difficulty in allocating weightage to diverse perspectives and measures in Balanced Scorecard model a new method with applying AHP and TOPSIS has been offered which can be improved the achieved result of the study. Also with using, the results of this study to identify strengths, weaknesses, and priorities organization's goals the possibility of more effective presence organization in competitive environment will be provided.

7. Conclusion

In this research, steps for design and implement the Balanced Scorecard for industrial groups has been expressed. Since Balanced Scorecard have some advantages such as:

Powerful concept in the translation and implementation of organization strategies, to strive for tangible the organization strategies across the organization, Create a snapshot of past and present status and trends and possibility of foresight the affair, linking various goals through cause and effect relationships, Easy to priorities activities, processes and organizational tasks, aligning the workers to general objectives, Enhanced association and attention to the strategy therefore, the importance of using this model in organizational environment will be specified.

As it has been shown, designing Balanced Scorecard is included thirteen steps namely; formation of work teams, develop a mission and vision statement, compiling strategic objectives, identifying aspects of the balanced scorecard, definition of critical success factors, ranking of critical success factors, ranking of Balance Scorecard aspects, setting up executive program, selection of indicators, designing strategy map, prioritization the identified indicator, calculation of the percentage of goal and the efficiency of performance indicators.

Furthermore, to implement the proposed methodology, prioritization methods and techniques such as AHP and TOPSIS should be addressed to prioritize strategic goals, Balanced Scorecard aspects, critical success factors and performance indicators. For future work, in order to completely implement the BSC in the industrial organizations, indicators should be introduced for each of the BSC's aspects; financial, costumer, internal process and learning and growth.

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