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IMPROVEMENT OF THE SYSTEM OF BUSINESS SUCCESS MEASUREMENT IN A COMPANY USING MULTICRITERIA DECISION-MAKING METHOD

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ABSTRACT: *Fast and successful adjustment of a company to modern business environment that is characterized by globalization, high demands of customers and shortening of product life cycles has become the main factor of its survival, growth and development. As a response to new business conditions a new - strategic concept of business system management and numerous methods for support to its implementation have been developed. Strategic concept of management seeks from an organization, besides efficiency that is a goal of traditional concept, to be also effective by directing all their efforts towards realization of strategic goals. Nevertheless, in practice it has been proved that only limited number of companies manages to successfully implement their strategies. A wish is to present through this Paper the most common causes of these failures, and to give certain solutions through use of method of multi-criteria analysis with an aim to implement strategy more successfully.*
KEYWORDS: *Balanced Scorecard, Strategy Management, Analytic Hierarchy Process*

INTRODUCTION

Until 80s of 20th Century business system management and business success measurement were based on traditional method of measurement and analysis of financial parameters. It was in line with management philosophy of that time in which competition was defeated by production volume, through cheap and standardized products and services, and financial measures showed success standards. Modern business environment that is characterized by growing globalization and degree of competitiveness, shortening of product life cycle, high demands of customers, need for knowledge management and better relationship with suppliers, made company work more complex. Fast and successful adjustment of a company to modern business environment has become the main factor of its survival, growth and development.

In this variable environment companies can survive and reach their long term goals only by timely defining of a good strategy and its successful implementation. Thereby, company management has to devote much energy, time and resources to successfully monitor and measure degree of realization of set strategic goals. These drastic changes of business environment have caused development of a new - strategic concept of business system management, and also development of methods and tools for business success measurement which give support to successful implementation of a given concept. It has been proved in practice that, even though there are given methods and tools, only limited number of companies manages to successfully implement their strategies. A wish is to present through this Paper the most common causes of these failures and to give certain solutions through use of method of multi-criteria analysis and optimization that would enable company management to implement chosen strategy more successfully.

STRATEGIC MANAGEMENT CONCEPT

Due to change in business conditions which at the end of last century were caused by appearance and development of information technology, globalization and hyper competitiveness, concept of conventional management was replaced by concept of strategic management. Application of new concept of management causes the change in focus from process and functions to strategy that has as its goal creation of value based on highly personalized product. New business conditions ask from organizations in planning process, decision making, monitoring and control of process and realization of improvement projects to take into consideration all necessary external factors and information. In order to survive, grow and develop, in given conditions organizations, besides being efficient that is a goal of traditional management concept, also have to be effective by directing all their efforts towards

realization of strategic goals. Companies are no longer able to make competitive advantage only by engagement and use of material resources because time of information and knowledge requires new capabilities and professionalism for reaching competitive success. Company's capabilities to manage in the best possible way its material resources became a key to creation and sustaining competitive advantages. The future of organization is more and more based on monitoring of non financial performances of organization, which represents significant change compared to traditional management concept.

BALANCED SCORECARD

Simultaneously with the change of the management concept, identification, measurement and business performance monitoring system changed. Due to outstanding changes of business conditions, it was perceived that widespread traditional system of performance measurement, based exclusively on financial performance system, is no longer able to satisfy the needs of modern control and management system. Its shortsightedness and orientation to the past, neglecting non material resources and insufficient support in directing company's activities towards realization of its vision and strategy, represented main limitations of traditional performance measurement system [4].

Managers had perceived that for monitoring of business success and making high quality decisions it is not sufficient to have only financial measures but they also have to be supplemented by measures of nonmaterial character through which nonmaterial property would be monitored. According to Stewart (Thomas Stewart) editor of Harvard Business Review Magazine: "the most important of all property is "soft" property like skills, capability, expertise, culture, loyalty, etc. This is knowledge property – intellectual capital – and it defines success or failure of organization" [10]. According to research of Brookings Institute, value of material property in companies is constantly decreasing and today physical property of companies, i.e. objects that can be measured by plain accountant techniques, represent less that one quarter of company value, and in 1982 is was around 40% of its value [17].

As a response to adjustment to new business conditions and need for new nonfinancial measures, several different methods of business success measurement have been developed, such as: Balanced Scorecard, Six Sigma, EFQM (European Foundation for Quality Management) Excellence Model, EVA (Economic Value Added) and others. Results of two different studies performed in the period from 2002 to 2006 in America [8], out of which the first was run in 150 American companies and the other one in 382 companies from 44 countries, it was shown that around 50% surveyed companies apply some form of performance measurement system. Studies proved that out of existing business success measuring methods more than 60% of the most successful organizations in the World use Balanced Scorecard Method [16]. Strong proves of omnipresence of BSC were given by Hackett Group, that in 2002 discovered that 96% of almost 2000 global organizations encompassed by the survey ran or intend to run BSC [10]. Potential benefits of BSC implementation are supported by the fact that it was enlisted among 75 most influential ideas of 20th Century by world famous magazine Harvard Business Review.

Balanced Scorecard makes it possible for vision and strategy to be implemented in a system of concrete goals and measures whose implementation is systematically monitored and measured [5]. In that way every business function has a perspective of a whole and clear picture of what it should do in order to reach indentified goals in all perspectives. It should be mentioned that BSC is not just a random collection of measures set in balanced perspectives, but primarily a part of strategic management system that enables transformation of vision and strategy in measurable quantitative and qualitative goals with inclusion of financial and nonfinancial parameters. Based on performed strategic analysis, defined vision and mission, company should identify critical factors of success and measuring characteristics (measures – performance) within all chosen perspectives. Critical success factors or generators of performances are all those factors, which if fulfilled enable a company to reach set strategic goals. When choosing perspectives most commonly used is "Kaplan and Norton Concept" which recommends use of perspective of customer, internal processes, learning and growth and financial perspective [7]. Nevertheless, every company has to start from its own specific situation in choosing necessary perspectives which was recommended by the very authors of the given concept, according to whom the four perspectives "should be seen as model not mold" [6].

For all success factors within given perspectives organization should define at least one measure that can be expressed by numeric value or attribute. Measures can be described as standards that can

be quantified and used for performance valuation in relation to expected results. For each measuring characteristic there is a description and frequency of measurement, measuring tool, target values (limits) that should serve for comparison with measured value. Critical success factor is reached when all its characteristics are within set limits. After choosing critical success factors and measures in all perspectives, all their mutual relationships within certain perspectives should be revealed; as well as relationships between factors of success and measures that are placed in different perspectives. Relationships are represented by strategic map that gives graphical display of everything a company has to do in every set perspective in order to implement strategy (Figure 1.).

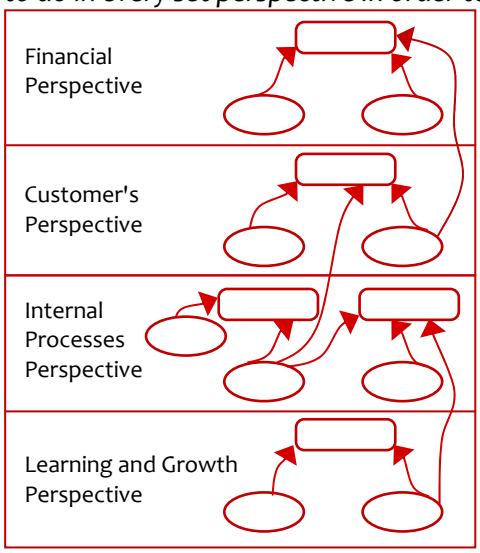

Figure 1. Strategic map

Set balanced system of measures is decomposed going from higher levels to lower levels of organizational units. The purpose of this is creation of preconditions for its implementation at all levels in an organization, as well as giving opportunity to all employees to show how their daily activities contribute to implementation of company's strategy. In order to preserve and thus fulfill its main function of dynamic management tool, BSC has to be constantly applied by influencing everyday operations in organization. Achieving set goals is constantly monitored through identified measurements, as well as successfulness of the very company that is successful only if it achieves its goals in all perspectives at the same time.

PROBLEMS IN STRATEGY IMPLEMENTATION

Although great number of companies applies strategic management concept and business success measurement methods, researches have shown that only 35% of surveyed companies stated that existing performance measurement systems are efficient, and only every tenth company manages to implement defined strategy [10]. Creators of BSC Kaplan and Norton believe that successfulness of strategy implementation lies in overcoming the obstacles in: vision (only 5% of work power understand strategy), management (only 25% of management has stimulus connected to strategy), people (85% of directorial teams spends less than one hour per week talking about strategy) and resources (60% of organizations does not connect budget to strategy) [10].

Fortune Magazine study from 1999 proved that 70% of failure of "top management" is not a result of bad strategy, but incapability of its implementation. Namely, during implementation and use of BSC and other methods for business success measuring there are many sideways and problems that can cause distortion of company image, wrong diagnosis, wrong moves and finally giving up on using them. Thereat, it is forgotten that they are just a good tool for management, and not a replacement for a good management.

Since its development (1991), BSC has seen many appraisals, but also critics. Very detailed explanation of possible reasons of unsuccessful implementation of BSC was given by Arthur M. Schneiderman according to whom there are six main reasons due to which most BSC eventually do not reach the expectations of its creators [14]:

1. Independent variables of balanced score card, as the main initiator of future stakeholder satisfaction, are irregularly identified. Defined measures are not often adjusted with vision and strategy of a company. Subjectivity in choosing measures creates problems also, and thus it should be present in the least possible amount. Schneiderman sees the greatest problem that causes failure of BSC in inadequate identification of measures.
2. Weakly defines metrics. Management often makes omissions in defining metrics for nonfinancial measures, that in comparison to financial metrics is more complicated and weakly elaborated.
3. Target values are not based on stakeholders' requests, main process limitations and possibilities of process improvement. Target values have to be objectively and clearly defined in accordance to realistic possibilities of its realization and existing company resources, not in accordance to managements' wishes.
4. There is no system that "lowers" goals of higher level to the level of sub-process where actually improvement activities are situated. Problems in implementation of BSC can happen if established

balanced measurement system is not decomposed from higher levels to lower levels of organization.

5. *No good methodology is used for implementation of system improvement. Organizations often eliminate only incurred mistakes, at the same time they do not undertake measures on finding and eliminating main causes of conflict occurrence.*
6. *There is no quantitative relationship of nonfinancial and expected financial results. There is a problem of quantification of nonfinancial parameters, i.e. their turning into money amounts (e.g. how much will company profit be increased if motivation of employees increases for one notch on set scale?). Responses to these questions require understanding company as a whole in which many synergic effects occur.*

Besides Schneiderman there are many more authors that tried to explain reasons of failure in implementation of BSC and point out its deficiencies. According to Stephen R. Letza failures that can occur during implementation of BSC are: measuring wrong things although they are measured in the right way, assumption that some things can not be measured, creation of conflicts between managers along function lines [9]. Alexandros Papalexandris emphasizes that BSC does not take into consideration or gives little importance to some important critical factors of success such as change management, project management and development of IT infrastructure [11]. According to Nick Bontis the greatest problem in implementation of BSC is focusing on only four perspectives from theoretical model although creators of BSC proposed, in case of need, for the model to be expanded with additional perspectives [3].

Based on previously listed standpoints, it can be concluded that main problem in implementation of BSC in practice is inadequate selection of measures. Besides this, problems associated with the following are identified: quantification of nonfinancial measures and measuring their influence on reaching strategic goals, defining goal values that are not based on realistic possibilities of their improvement, lack of cascading system for BSC to lower levels of companies and inadequate selection of perspectives.

APPLICATION OF AHP IN MEASURES SELECTION

Inadequate selection of measures, as the main problem in failure in use of BSC in business systems, could be greatly decreased or totally eliminated by use of Multi-Criteria Decision-Making in the process of measures selection. By using these methods in development of strategy map BSC, systematic and impartial process of measures selection would be provided. This Paper proposes the use of Analytic Hierarchy Process Method due to its easy understanding and simple use in solving stated problem. For the problem one can also use Analytic Network Process that uses more complex estimates, and AHP being only special case [12].

Analytic Hierarchy Process -AHP Method was developed by Thomas Saaty in the beginning of 70s of the 20th century as a reaction to discovery on non existence of unique, simple to use and easily understandable methodology that would enable making complex decision taking into consideration quantitative and qualitative aspects of decision [2]. Almost universal applicability of AHP Method, as a new paradigm for decision making, together with simplicity of its use resulted in it being today one of the most popular and most commonly used methods for multi criteria decision making in solving complex problems [1]. AHP Method offers opportunity for a problem to be divided into hierarchy of problems, with an aim at the top and criteria and alternatives at lower levels of hierarchy that can be easily understood and subjectively evaluated. Subjective evaluations with use of Saaty's Scale of Relative Importance [13] are translated into metrical values out of which one forms matrix of size n x n whose consistency is being evaluated. Based on mathematical model, local priorities (weight) of each criteria in the Model is being counted, then one defines line of importance (participation) of alternatives in the framework of every observed criteria. Participation of every alternative is multiplied with weight of observed criteria/sub-criteria and then obtained values are added for each alternative individually. Obtained values represent weights (priorities) of observed alternatives in the Model [2].

In development of AHP Model for selection of measures, all perspectives are given the same importance, thus they did not have direct influence on selection of measures, so that criteria of balanced perspectives was obeyed. Authors of some papers [15] have given more importance to customer and financial perspective; although it was shown that today growth and development perspective have greater influence on creation of value and survival, development and growth of

company. Before choosing alternatives, management team should define criteria for selection and measures (alternative) group in every perspective out of which in the process of decision making through AHP method a final list of measures will be synthesized. Figure 2 shows AHP model, developed for support to the process of making decision on choice of the most relevant measures in the framework of every set perspective individually.

For selection of alternatives (which in this case represent measures) the following four criteria are taken into consideration:

- *Data Availability (K1) refers to possibility of data collection and amount of resources that will have to be used for that. During selection of measures it should be taken in consideration that the costs of data collection should be lower than the value that can be obtained by their use. Also, one should have in mind existence of measuring means for measurement of individual parameters.*
- *Metrics Complexity (K2) with these criteria one should observe complexity and elaboration of existing metrics, existence of measurement standards and possibility of comparing measures with other organizations. In doing so, when possible, one should avoid measures that rely on subjective evaluation.*
- *Relationship with Strategic Goals (K3) One analyses influence a chosen measure has on realization of strategic goals. Choice of measures that have no influence on company strategy realization lead to obscurity, problems in communication and wasting valuable resources in trying to reach goal values of measures that do not influence reaching strategic goals.*
- *Influence of Critical Success Factors (K4) In comparing measures and giving importance to measures one monitors number of critical factors of success which measures influence within all perspectives at strategic map and intensity (importance) of influence of individual measure on reaching critical success factors.*

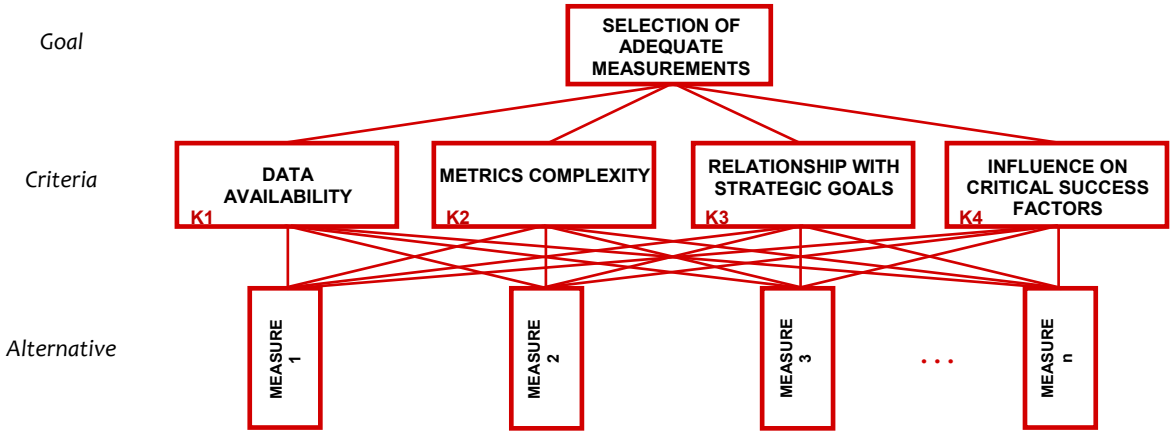

Figure 2. AHP Model for measure selection in perspectives

Implementation of developed AHP Model has been done at company ZP "Elektrokrajina" a.d. whose main activity is electric power distribution. In doing so, as support to choice of measures, software package Expert Choice which completely supports AHP Method was used. First, ranking of criteria according to their individual influence on goal reaching choice of adequate measures was performed. Ranking was performed by comparison of all possible pairs of criteria in accordance to Saaty's Scale of Relative Importance, whose values are then inserted in Matrix of priority comparison (Figure 3). Figure shows criteria comparison, K1 - data availability and K2 –simplicity of calculation, whereas criteria K1 has been given double importance. In the matrix, shown values of comparison are marked with black, whereas element in a row has greater priority, and in cases when element in a column has greater priority values are marked in red.

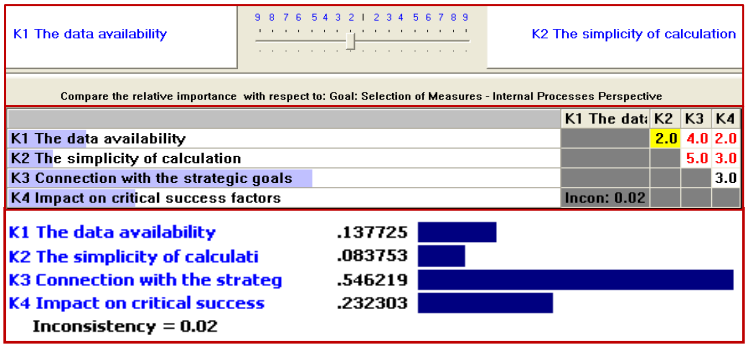

Figure 3. Local criteria priorities of AHP Model

Based on the matrix of priority criteria comparison and mathematical model AHP method, local priorities (weights) of each criteria in model (Figure 3) are calculated; which will be applicable to all perspectives. Then, in each of four perspectives, based on the same methodology, importance (participation) of alternatives – measures within each observed criteria are calculated. Figure 4 presents a matrix of priority comparison and importance of measures in reference to criteria K3 - Connection with the strategic goals in Learning and Growth Perspective. Within perspectives, participation of each measure in reference to specific criteria is multiplied by weight of observed criteria and then obtained values are added for each measure individually. Obtained values represent importance of observed measures in given perspectives and they serve as basic parameter for measure selection (Figure 4.). ZP "Elektrokrajina" a.d. company management, based on the list received made selection of proposed measures according to perspectives and out of selected measures they set the final strategic map (Figure 5.).

Goal: Selection of measures - Financial perspective	
The data availability (L: .138)	M1 Network losses .34728
The simplicity of calculation (L: .084)	M2 Monitoring the investment effects .07321
Connection with the strategic goals (L: .546)	M3 Collection of receivables .21213
Impact on critical success factors (L: .232)	M4 Increasing charge of customers with high consumption .15468
	M5 Share of profits in total income .21269
Goal: Selection of measures - Customer perspective	
The data availability (L: .138)	M1 Customer satisfaction index .38399
The simplicity of calculation (L: .084)	M2 The percentage of customers who had complaints .25134
Connection with the strategic goals (L: .546)	M3 Interruption of electricity over 4 hours per customer .18871
Impact on critical success factors (L: .232)	M4 The percentage of complaints to the voltage quality .17596
Goal: Measures Selection - Internal Processes Perspective	
K1 The data availability (L: .138)	M1 The number of ULI per customer .15107
K2 The simplicity of calculation (L: .084)	M2 Increase in the number of measuring points on the LV network .07767
K3 Connection with the strategic goals (L: .546)	M3 The number of corrected bills .04743
K4 Impact on critical success factors (L: .232)	M4 The percentage of customers excluded from the network .07781
	M5 The percentage of warn buyers for the debt over a defined limit .07781
	M6 The percentage of consumers with remote reading of consumption .11282
	M7 The percentage of estimated bills .04775
	M8 The percentage of system with displaced reading .11282
	M9 Duration of ULI per customer .14861
	M10 Duration of ULI interruptions in the responsibility of distributors .14620
Goal: Selection of measures - Learning and Growth Perspective	
K1The data availability (L: .138)	M1 Investments in developing .16688
K2 The simplicity of calculation (L: .084)	M2 Lost working hours due to sick leave .06016
K3 Connection with the strategic goals (L: .546)	M3 Personal income per employee .07163
K4 Impact on critical success factors (L: .232)	M4 Organizational culture .05967
	M5 Coverage of the process with an integrated information system .04798
	M6 Representation of 20 kV Electric Power overhead lines .12848
	M7 Representation of 20 kV underground cable lines .12848
	M8 The percentage of defined competencies coverage .04272
	M9 Percentage of employees who attended some form of training .09736
	M10 Percentage of workplaces with computer .05044
	M11 Fluctuation rate of employees .05924
	M12 Employee satisfaction .08696

Figure 4. Calculated priorities of measures per perspective

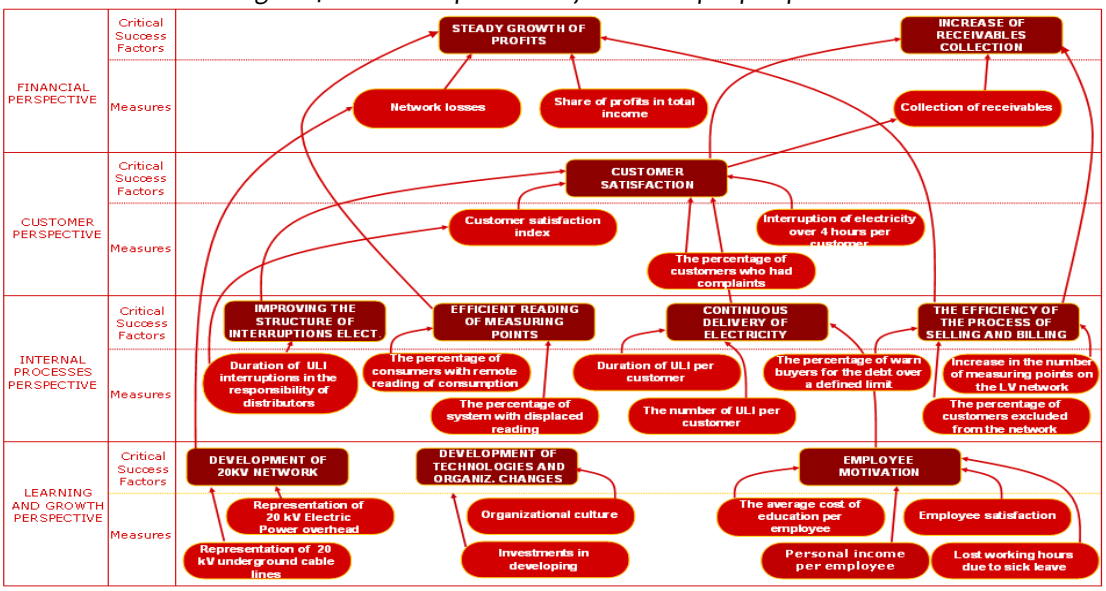

Figure 5. Strategic map of ZP "Elektrokrajina" a.d. Banja Luka Company

In financial perspective, measures M2 are M4 were rejected, in customer perspective measurement M4 was rejected, in perspective of internal processes measures M3 and M7 were rejected and in learning and growth perspective measures M5, M8, M10 and M11 were rejected. One should emphasize that there are no set rules that prescribe total number of measures in strategic map or individual perspectives, but companies have to make decision by themselves on selection of most important measures with which they could describe adequately their strategy. Researches of BSC practitioners discovered that most of companies use only from 20 to 25 measures at the highest level [10].

CONCLUSIONS

Use of method of multi-criteria decision-making can greatly help management of companies in selecting measures as one of the most delicate phases of BSC designing. These methods enable systematic and impartial process of measures selection in which decision maker is directed only to a part of complex problem that was previously decomposed in hierarchy, which represents its strongest characteristic. Developed AHP model presented in the Paper can be successfully implemented in all organizations that want to design their own BSC, giving management valid information on importance of certain measures.

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