

A Proposed Framework for Integrating The Balanced Scorecard into the Strategic Management Process.

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Abstract

The Balanced Scorecard (BSC) proposed by Kaplan and Norton has been accepted by the business world, worldwide, as a very promising tool for the performance measurement of an organization at the firm level. Later on, its founders described the way of using their model as an integrated system of the whole strategic planning process. However, what it still remains vaguely explained is the operational (practical) connection of the BSC model to the strategic planning and performance measurement process. The ambition of the present paper is to demonstrate a method that could easily connect directly the various performance measures (criteria) of a BSC with the stated goals and objectives of any firm. Specifically, it explains in great detail how the multicriteria method of Analytical Hierarchy Process (AHP) could practically facilitate this connection. It analyses how a firm could arrange the various performance criteria in such a way that could be capable of controlling its stated goals and objectives through the implementation of its strategy. This paper starts with a literature review concerning the two methods, BSC and AHP, and then proceeds to the formation of the proposed framework, which actually facilitates the formal and quantitative links between the firm's stated performance criteria and its overall strategic planning and performance measurement process.

Keywords: Balanced Scorecard, multicriteria method of AHP, performance measurement.

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1. Introduction

It has become clear that the 1990's has become a staggeringly different and much more demanding era for quality - and for business in general - than was experienced throughout the 1980's [Christopher and Thore, (1993: 2-1.3)]. The reason is that the gradual momentum toward an increasingly open, globally competitive marketplace, now has an unstoppable force - not only for Europe (with the establishment of European Union, the abandoning of import tariffs and quotas, and the monetary union agreement) but throughout the world (through the new General Agreement for Trade and Tariffs-GATT and other similar international agreements). This will mean an enormous increase in the competitive pressure upon most companies in both prices as well as quality standards [Christopher and Thore, (1993: 2-1.3)].

The fundamental business strategic impact is that, to protect its position in its home market, a company must be able to design, build and sell its domestic product lines with the potential also for supremacy in the international market place, even though there isn't yet much import competition or interest in exporting. And it must do this quickly - a huge job for many companies. The principle is that if a company can get foreign competition today, it will get it. Operating in international leadership terms is the only way for a business to grow in terms of this principle rather than be eroded by it. [Feigenbaum, (1993)].

The strategic management process does not end when the firm decides what strategy (ies) to pursue. There must be a translation of strategic thought into strategic action. Successful strategy formulation does not guarantee successful strategy implementation. David (1999: 216) says that it is always more difficult to do something (strategy implementation) than to say you are going to do it (strategy formulation). Furthermore, the best formulated and implemented strategies become obsolete as a firm's external and internal environments change. It is essential, therefore, that firms systematically review, evaluate, and control the execution of strategies. Effective performance measurement and improvement of the implemented strategies must be an integral part of the strategic management process [Kaplan and Norton, (1993: 1)]. A framework/model that supports this integrated management system will assist management and their firms to excel in both, taking proper strategic decisions and implement them effectively and efficiently. The focus of the performance measurement and improvement process should be on involving all levels of management in strategic planning, i.e., in translating strategy into action [Sink and Tuttle, (1989: 19)].

Performance measurement, in order to have validity, must derive from the strategy of the organization. It is only when this derivation of performance measures comes from the heart of the strategic focus that management can hope to employ the necessary energies for effective continuous improvement. This process provides management with the necessary information feedback system to enable a continuous improvement

process, which will drive the re-examination of the strategic direction of the organization. A valid collection of strategy driven performance measures will enable a continuous feedback of customer needs, competitive costs, responsiveness, and other critical indicators of world class performance [Campi, (1993)].

The emergence of new information technologies and the opening of global markets has changed many of the fundamental assumptions of modern business. No longer can companies gain sustainable competitive advantage solely by developing tangible assets. The information-age environment for both manufacturing and service organizations requires new capabilities for competitive success. The ability of a company to mobilize and exploit its intangible assets has become decisive in creating and sustaining competitive advantage [Itami, (1987)].

2. The Balanced Scorecard

Organizations face many hurdles in developing performance measurement systems that truly measure the right things. In the past, as companies invested in programs and initiatives to build their capabilities, managers relied solely on financial-accounting measures. Today, however, the financial accounting model must be expanded to incorporate the valuation of the company's intangible and intellectual assets. What is needed is a system that balances the historical accuracy of financial numbers with the drivers of future performance, while also assisting organizations in implementing their different strategies. The Balanced Scorecard (BSC) is probably the tool that answers both challenges.

In 1990, Kaplan and Norton led a research study of a dozen companies exploring new methods of performance measurement [Niven, (2002: 11)]. The impetus for the study was a growing belief that financial measures of performance were ineffective for the modern enterprise. The study companies, along with Kaplan and Norton, were convinced that a reliance on these measures was affecting their ability to create value. The group discussed a number of possible alternatives but settled on the idea of a Scorecard featuring performance measures capturing activities from throughout the organization-customer issues, internal business processes, employee activities, and of course shareholder concerns. Kaplan and Norton labeled this new tool the Balanced Scorecard and later summarized the whole concept in the first of three *Harvard Business Review* articles (1992, 1993, 1996A).

Over the next few years a number of organizations adopted the BSC and achieved immediate results. Kaplan and Norton (1996A) discovered that these organizations were not only using the BSC to complement financial measures with drivers of future performance but were also communicating their strategies through the measures they selected for their BSC. As the BSC gained prominence with organizations around the globe as a key tool in the implementation of strategy, Kaplan and Norton summarized the concept and the learning to that point in their 1996 book *The Balanced Scorecard*.

Since then the BSC has been adopted by nearly half of the *Fortune* 1000 organizations and the momentum continues unabated [Niven, (2002)].

The BSC communicates the multiple, linked objectives that companies must achieve to compete based on their intangible capabilities and innovation. The BSC translates mission and strategy into goals and measures, organized into four different perspectives: financial, customer, internal business process, and learning and growth.

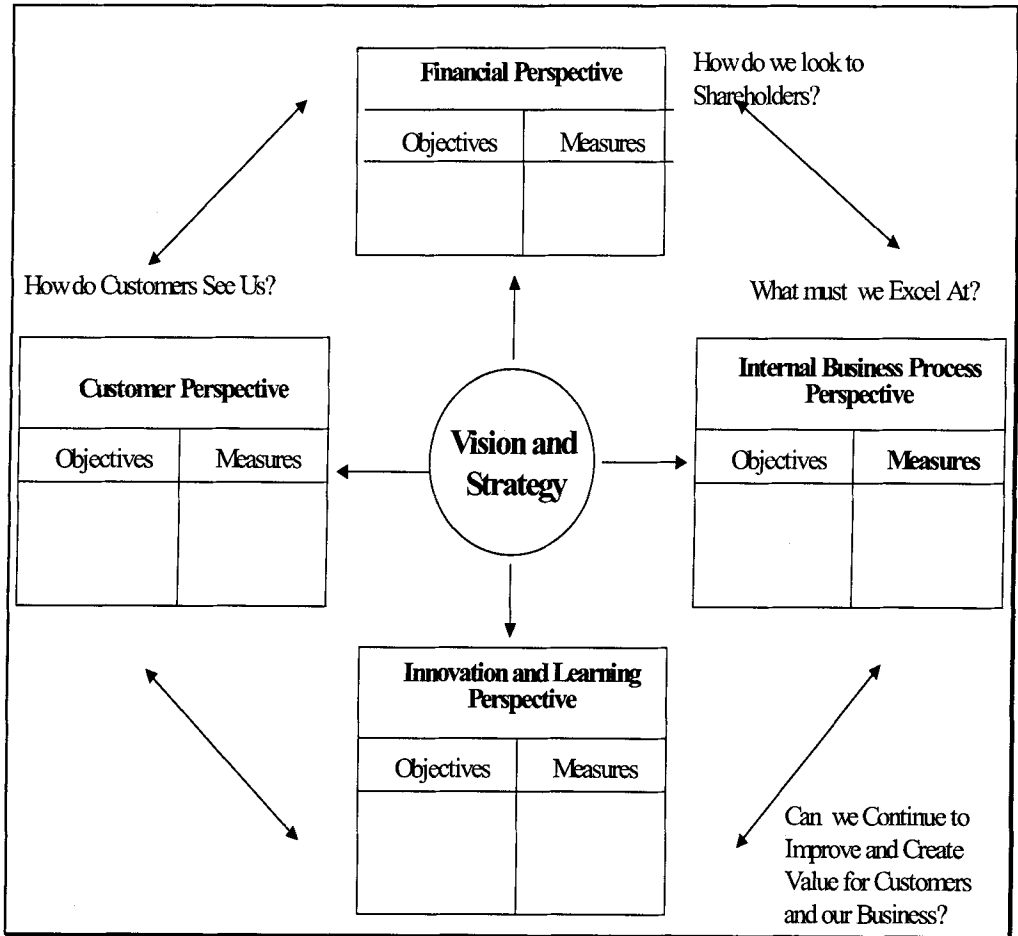


Figure 1. *The Balanced Scorecard [Kaplan and Norton, (1996A)]*

The BSC retains the financial performance perspective because financial measures are essential in summarizing the economic consequences of strategy implementation. In the customer perspective of the BSC, managers identify the customer and market segments in which the business desires to compete. Targeted segments could include both existing and potential customers. Then, managers develop measures to track the

business unit's ability to create satisfied and loyal customers in these targeted segments. In the internal business process perspective, managers identify the critical internal processes for which the organization must excel in implementing its strategy. The internal business processes dimension represents the critical processes (innovation processes, operations processes, and post-sales service processes) that enable the business unit to deliver the value proportions that will attract and retain customers in targeted market segments, and satisfy shareholder expectations regarding financial returns. Thus, the internal business process measures should be focused on the internal processes that will have the greatest impact on customer satisfaction and achieving the organization's financial objectives. The fourth perspective-learning and growth- identifies the infrastructure that the organization must build to create long-term growth and improvement. The customer and internal business process perspectives identify the factors most critical for current and future success. However, businesses are unlikely to be able to meet their long-term targets for customers and internal processes using today's technologies and capabilities for delivering value to customers and shareholders. Intense global competition requires companies to continually improve their capabilities for delivering value to customers and shareholders. Organizational learning and growth come from three principal sources: people, systems, and organizational procedures. The financial, customer, and internal business process objectives will typically reveal large gaps between existing capabilities and those required to achieve targets for breakthrough performance. To close these gaps, businesses must invest in training employees, enhancing information technology and systems, and aligning organizational procedures and routines. These objectives are articulated in the learning and growth perspective of the BSC.

All BSCs use certain *generic measures*. These generic, or core outcome, measures reflect the common goals of many strategies, as well as similar structures across industries and companies. These generic measures include profitability, market share, customer satisfaction, customer retention, and employee satisfaction. They usually cover the two perspectives, the financial and the customer, and reflect decisions and actions taken much earlier, thus they are the long-term indicators of any company. The *drivers of performance* are the ones that tend to be unique for a particular business unit. The performance drivers reflect the uniqueness of the business unit's strategy. They are the short-term indicators of present and future success. They should lead the entire organization to focus on these drivers, to show what people should be doing day-by-day to enable successful outcomes to be produced in the future. In most cases, the performance drivers describe how a business process is intended to change, thus covering the remaining two perspectives, the internal business processes (mainly) and the learning and growth. The BSC, by providing short-term indicators of long-term outcomes, has become the guidance system to the future of any firm (Kaplan and Norton, 1996B).

A good BSC should have a mix of outcome measures and performance drivers (i.e., critical input and process measures). Outcome measures without performance drivers do not communicate how the outcomes are to be achieved. They also do not provide early warning about whether the strategy is being implemented successfully. Conversely, performance drivers based on inputs and processes alone enable the business unit to achieve short-term operational improvements. However, these measures fail to reveal whether the operational improvements have been translated into expanded business with existing and new customers, and, eventually, into enhanced financial performance. Thus, a good BSC should have an appropriate mix of core outcome measures (lagging indicators) and the performance drivers (leading indicators) of these outcomes. In this way, the BSC translates the business unit's strategy into a linked set of measures that define the long-term strategic objectives, as well as the mechanisms for achieving those objectives.

A BSC must be used for both strategic evaluation processes, the evaluation of the alternative strategic options, during the strategic formulation process, for the selection of the best strategy, and the continuous evaluation of the implemented strategy for confirming whether or not is capable of achieving its stated goals and objectives. In the latter case the alternatives could be different departments or divisions of the same Strategic Business Unit (SBU) of a company.

3. The Analytic Hierarchy Process

The Analytic Hierarchy Process (AHP), developed at the Wharton School of Business by Thomas Saaty (1980, 1996), allows decision makers to model a complex problem in a hierarchical structure showing the relationships of the goal, objectives (criteria), sub-objectives, and alternatives. Thus, a typical hierarchy consists of at least three levels, the goal(s), the objectives, and the alternatives.

AHP enables decision-makers to derive ratio scale priorities or weights as opposed to arbitrarily *assigning* them. In so doing, AHP not only supports decision-makers by enabling them to structure complexity and exercise judgment, but allows them to incorporate both objective and subjective considerations in the decision process (Forman, 1983).

In most cases the priority ranking of the various measures is not uniform across all decision makers at all levels, i.e., different constituencies (such as departments or divisions) hold different opinions as to the relative importance of the measures. When opinions differ about ranking measures is where the AHP comes into its own. Whereas something like DELPHI technique seeks resolution by iterative polling until consensus is reached, the AHP user asks constituents (via a questionnaire) to make a sequence of pairwise comparisons of the measures, and the comparisons then are analyzed via a mathematical model to establish the relative priorities of the measures (usually taking the geometric mean of the answers for each specific question), after

which another algorithm is applied to establish the final ranking of the decision objectives or alternatives (i.e., the different strategies, departments or divisions).

The results then are synthesized to determine the overall importance of each alternative in achieving the main (overall) goal. The pairwise comparisons are quantified using the standard one-to-nine AHP measurement scale [Doumpou and Zopounidis, (2001: 108)]:

Table 1. The standard AHP measurement scale

Ratio	Term	Explanation
1	Equal Importance	Two activities contribute equally to the objective.
3	Moderate Importance	Experience and judgment slightly favor one activity over another.
5	Essential or Strong	Experience and judgment strongly favor one activity over another.
7	Demonstrated Importance	An activity is strongly favored and its dominance is demonstrated in practice.
9	Extreme Importance	The evidence favoring one activity over another is of the highest possible order of affirmation.

The AHP is ideally suited to help resolve certain problems that arise when multiple criteria are used in performance evaluation. For example, the pairwise comparisons for measure (s) priority can be done using a ratio scale. This facilitates the incorporation of non-quantitative measures into the evaluation scheme, since it forces participants to translate all criteria into relative priority structures based on the scale. Thus, using the AHP means that non-quantitative assessments can be combined with quantitative assessments in rating a unit or an individual.

The AHP has been widely and successfully applied in a variety of decision-making environments [Zahedi, (1986); Golden, Wasil, and Harker, (1989); Zopounidis and Doumpou, (1997, 1998, 1999A, 1999B, 2000A, and 2000B)].

4. The proposed BSC – AHP framework

4.1. The Balanced Scorecard Measures

Suwignjo, *et al.* (2000) developed an approach for the quantitative modeling of performance measurement systems. The objective of their research was to identify tools and techniques that would facilitate:

- identification of factors (measures) affecting performance and their relationships,
- structuring the factors hierarchically, and
- quantifying the effect of the factors on the overall performance.

Stage one of the approach uses the cognitive mapping technique to identify factors, which affect performance and their relationship with one another. This is a very similar approach to the 'strategy map' proposed by Kaplan and Norton (1996B; 2001).

In stage two the cognitive maps are converted into cause and effect diagrams, which are used as a discussion tool to structure the factors that affect performance hierarchically. Structure diagrams are then used to formalise the hierarchical nature of the performance measurement system [Suwignjo, *et al.* (2000), p 233]. Finally, in stage three the Analytical Hierarchy Process is used to quantify the relationship of each factor with the others with respect to overall performance.

Sohn, *et al* (2003, p. 282) proposed a list of BSC measures, after a complete survey of relevant literature, which '*can be considered as a revision of Kaplan and Norton's original measures*'. These BSC measures consist of the four major perspectives and twenty sub-measures, five by each major measure (perspective). For example, the financial measures include revenue growth, investment, profitability, asset utilisation, and unit cost. In particular, a measure called 'knowledge sharing' is included for the learning/growth perspective.

The relative weights for each performance measure can be calculated using the Analytic Hierarchical Process (AHP) on the basis of two stepwise questions. First, six questions are asked for comparing (pairwise) the major BSC measures (financial, customer, internal process, and learning/growth). Subsequently, ten questions are asked to compare (pairwise) the five sub-performance measures under each major measure (Saaty and Vargas, 1994).

The AHP converts the pairwise comparisons into the weights. The computational procedure can be supported by a tool like Expert Choice v.11 (Expert Choice, Inc., 2004). The AHP constructs a set of pairwise comparisons as a square matrix A as follows:

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix}$$

where a_{ij} is a relative value with respect to factor j of i , $a_{ij} = 1/a_{ji}$ and $a_{ii} = 1$.

To verify the level of logical inconsistency of matrix A , the consistency index (CI) is calculated. λ_{\max} is the largest eigenvalue of matrix A . Saaty (1980) defines the consistent index as $CI = (\lambda_{\max} - n)/(n-1)$ and uses the consistency ratio (CR), which is the CI divided by the average random index from the empirical data. If the value of

CR is less than 0.1, it is typically considered acceptable; larger values require the decision-maker to reduce the inconsistencies by revising judgments.

Finally, Chen and Pan (2004) adopt the AHP in identifying key performance indicators (KPIs) for the service industry from a list of performance measures covering the four dimensions of the BSC. Their research employs two stages: They first identify as many as possible KPIs of the service industry that have been discussed through a meta-analysis on SSCI journals published between 1999 and 2002. Moreover, several depth interviews with various executives were performed to identify relevant KPIs. Then, colleagues of respective disciplines and practitioners were invited to fill respective AHP questionnaires and the results gathered from this survey were then analyzed to verify the most important KPIs of each dimension. Computation was ended at clearly determined KPIs through comparison of weight loading. Any AHP importance weight values larger than 0.1, were included as KPI of particular dimensions.

Examining very carefully all above researches we could come to the following two conclusions. First, they all use a similar way to identify the objectives and sub-objectives of a BSC with the use of AHP, something that we totally agree with. Second, they all use objectives and sub-objectives for the four dimensions of the BSC, and this is something that we must object to for the following reasons:

As we have already mentioned above, Kaplan and Norton (1996B), the founders and the most experienced professionals in applying BSCs to any type of organization, stress the fact that *'a good BSC should have an appropriate mix of core outcome measures (lagging indicators) and the performance drivers (leading indicators) of these outcomes'*. They also indicate which exactly these core or generic measures should be (profitability, market share, customer satisfaction, customer retention, and employee satisfaction) and explain why these outcome measures should belong only to the two perspectives (financial and customer), mainly because they *'reflect the common goals of many strategies, as well as similar structures across industries and companies'*. Concerning the performance drivers, they also state that *'they should lead the entire organization to focus on these drivers, to show what people should be doing day-by-day to enable successful outcomes to be produced in the future. In most cases, the performance drivers describe how a business process is intended to change, thus covering the remaining two perspectives, the internal business processes (mainly) and the learning and growth'*. Consequently, the performance drivers should actually represent the sub-measures of the finance and customer perspective

4.2. The BSC – AHP framework

Taking into consideration all previous remarks, the hierarchical structure of the evaluation of the performance of alternative competitive strategies or alternative departments/divisions of any firm could be constructed as indicated in Figure 2.

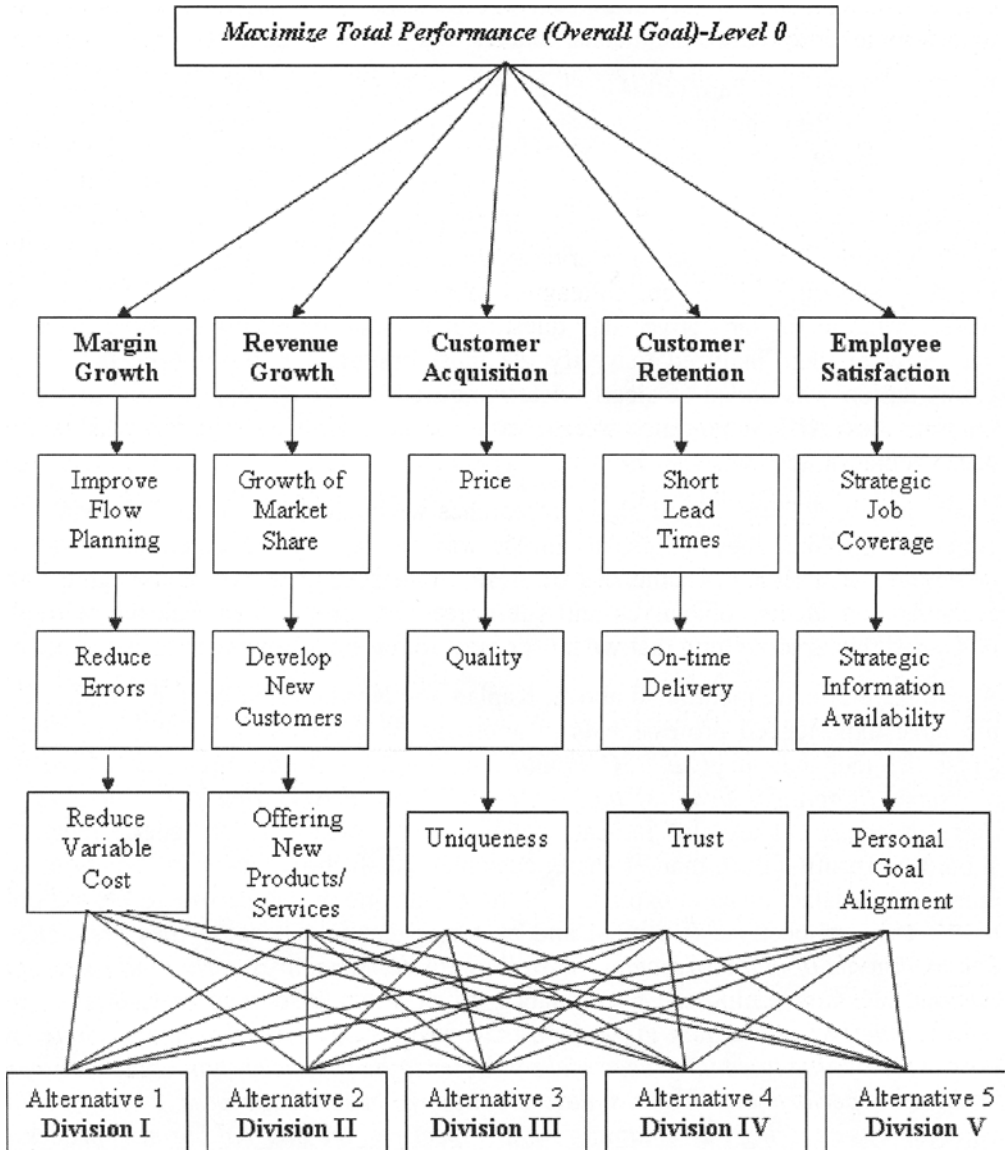


Figure 2. Hierarchical structure of competitive strategy performance evaluation

The level 0 of the structure is the overall goal (maximize total performance). For the attainment of this overall goal, the firm (or the Strategic Business Unit) must excel in each and every one of the five outcome measures (objectives) stated at level 1. The performance drivers consist of the sub-measures stated at level 2. These sub-measures

could be selected using any one of the three methods described in section 4.1 and would mainly represent cost and value drivers of the internal business processes perspective, depending on the specific competitive strategy followed by the SBU. The only thing that is missing from the proposed model is the stated alternatives, which should be at level 3. These alternatives could change depending from the purpose of the model. For example, if we wish to evaluate different strategic options proposed by the managers of the SBU, then the alternatives should be the various proposed competitive strategies. If the top management of the SBU wishes to measure the performance of its departments or divisions, then the alternatives should be the various departments or divisions.

4.3. An example based on the proposed BSC – AHP framework

Let us assume that a specific strategic business unit (SBU) has developed its own BSC-AHP model, which is the same as the one in figure 2. Moreover, this SBU consists of four divisions, I, II, III, and IV. The firm wishes to evaluate these four divisions using the adopted BSC-AHP model.

It should be stressed that managers of the specific SBU are undertaking self-evaluation using the AHP. Although their ratings are used to establish the hierarchy of the performance criteria, managers (or their divisions) are rated by their superiors on the basis of their achievements in line with the criteria (objectives and sub-objectives), using a pairwise comparison of the divisions by the criterion. Thus, the performance measurement takes place in two interrelated phases, first establishing the priority of the criteria by participative input and then comparing divisions on the basis of those criteria. The second stage can be done by single or multiple evaluators since the AHP can accommodate either form. Hence, the performance evaluation process can be expanded to a team approach, thus bringing more knowledge of the relationship of the managers and the criteria.

The AHP can also incorporate a desired standard of performance on the multiple criteria. Such a standard can be seen as an overall set of objectives and sub-objectives to be attained by the organization or the divisions. By assessing deviations from the 'standard', evaluators can comment about the degree to which the organization or division has achieved its objectives over the period of the evaluation.

The SBU of our example defined its divisions geographically (different countries), since the company believed this to be the most efficient and effective means to service its world markets. Each division established branch plants within the respective countries so that they could take advantages of proximity to markets and suppliers to enhance their competitive edge.

Because of the degree of autonomy given to the division managers and the strong commitment to SBU goals, the decentralization proved to be a positive factor in company success. In general, managers and employees alike shared the growth and

expansion of the company. However, with decentralization and the increased competition due to globalization, came the need to establish a means of monitoring and evaluating the divisions and the division managers. Thus, the managers of the four divisions, in cooperation with expert consultants that their company agreed to hire, constructed the measurement system proposed in figure 2.

First, they were asked to compare the relative importance of the twenty evaluation criteria (first the five objectives and then the fifteen sub-objectives) on a pairwise scheme. In providing these comparisons, division managers were encouraged to rate the criteria according to their significance for their own divisions. In order to allow for input from all involved parties on the significance of the evaluation criteria in assessing total performance, the geometric mean (Saaty, 1980:68) of the four evaluations (four division managers) was computed. With the use of an AHP software tool, the preference vectors (eigenvalues) were then computed to represent the respondents' overall assessment on the relative importance of the twenty criteria in performance evaluation, as in table 2:

Table 2. Eigenvalues regarding the relative importance of the twenty criteria

	Evaluation Criteria	Eigenvalues
1	Margin Growth (1st Objective)	
1.1	Improve Flow Planning	0.493
1.2	Reduce Errors	0.311
1.3	Reduce Variable Cost	0.196
	<i>CR=0.05<0.1</i>	
2	Revenue Growth (2nd Objective)	
2.1	Growth of Market Share	0.594
2.2	Develop New Customers	0.249
2.3	Offering New Products/Services	0.157
	<i>CR=0.05<0.1</i>	
3	Customer Acquisition (3rd Objective)	
3.1	Price	0.140
3.2	Quality	0.333
3.3	Uniqueness	0.528
	<i>CR=0.05<0.1</i>	
4	Customer Retention (4th Objective)	
4.1	Short lead-times	0.200
4.2	On-time delivery	0.200
4.3	Trust	0.600
	<i>CR=0.00<0.1</i>	
5	Employee Satisfaction (5th Objective)	
5.1	Strategic job coverage ratio	0.659
5.2	Strategic information availability ratio	0.156

5.3	Personal goal alignment	0.185
	<i>CR=0.03<0.1</i>	
1	Margin Growth	0.314
2	Revenue Growth	0.314
3	Customer Acquisition	0.153
4	Customer Retention	0.132
5	Employee Satisfaction	0.087
	<i>CR=0.01<0.1</i>	

After establishing the priorities of the twenty evaluation criteria, the two divisional vice-presidents were asked to proceed to pairwise comparisons between the divisions on the basis of actual results of each of the fifteen sub-criteria (sub-objectives) separately. The divisional vice-presidents created a ‘standard’ fifth division for the analysis to allow direct comparison with overall SBU goal and sub-objectives. Thus, with the establishment of the ‘standard’ Division V, the divisions’ performance is not only evaluated against each other but also against the SBU’s objectives and sub-objectives.

In line with the previous analysis, the responses of each vice-president were pooled using geometric means and preference vectors of the fifteen sub-measures were computed to assess the relative performance of the four divisions on the basis of each individual sub-measure:

Table 3. Eigenvalues regarding the relative performance of the Divisions for each of the fifteen sub-measures

Divisions	1.1	1.2	1.3	2.1	2.2	2.3	3.1	3.2	3.3	4.1	4.2	4.3	5.1	5.2	5.3
I	.226	.062	.263	.226	.056	.059	.200	.056	.057	.257	.260	.270	.303	.300	.260
II	.141	.097	.160	.141	.087	.096	.125	.087	.089	.141	.140	.132	.163	.159	.140
III	.087	.160	.097	.087	.141	.158	.078	.141	.145	.067	.064	.058	.080	.072	.064
IV	.056	.263	.062	.056	.226	.260	.051	.226	.250	.045	.064	.093	.053	.072	.064
V	.490	.419	.419	.490	.490	.427	.546	.490	.459	.489	.471	.447	.400	.397	.471
CR	.02	.02	.02	.02	.02	.01	.03	.02	.01	.05	.05	.06	.04	.04	.05

Based on the eigenvalues of table 3 it is difficult to determine whether, for example, Division I or II has the best performance overall, and whether either is above the ‘standard’ (Division V). Accordingly, the last step of the AHP, i.e., the multiplication of the eigenvalues of table 3 with those of table 2 was conducted and the resultant vector, as given in table 4, provides a relative ranking of the four operating divisions:

Table 4. Relative Ranking of the Divisions on the basis of the fifteen sub-measures

Division	Resultant Vector
V	0.463
I	0.183
II	0.126

IV	0.124
III	0.104
CR	0.02<0.1

As can be seen, Division I has the best performance on the basis of the fifteen evaluation criteria whereas Division III has the worst. However, none of the four divisions has managed to reach the objectives stated by the top management, because their ranking is well below the 'standard' (Division V) stated by the two divisional vice-presidents.

5. Conclusion

To ensure its survival in the global economy, the modern organization needs to develop better methods of assessing its performance than simply using financial measures such as return on investment or residual income. In addition to the goal of financial well-being, other goals are vital to the company's long-term profitability and survival. Kaplan and Norton (1992, 1993, 1996A, and 1996B) proposed the BSC as a suitable model for the performance measurement process of any type of organization. This model is a multiple criteria performance evaluation scheme that any organization's effectiveness in achieving various corporate goals and targets can be assessed.

In this paper, the Analytic Hierarchy Process (AHP) is suggested as a tool for implementing the Balanced Scorecard (BSC) model. The advantages offered by this methodology are:

- 1) both quantitative and qualitative measures can be included in the model;
- 2) it allows for multiple input in the setting of priorities of the evaluation criteria as well as in the evaluation of the company or its departments or divisions;
- 3) subjectivity in setting priorities for evaluation criteria and assessing company's or divisional performance is reduced by the pairwise comparisons;
- 4) consistency in judgment is improved;
- 5) the evaluation of performance against standards can be incorporated in the process; and
- 6) the resultant vector of the AHP provides a composite performance measure which can be used for other purposes such as the allocation of resources or bonuses to divisions.

There are, however, limitations to the use of AHP:

- 1) the time and effort required to use the AHP can be substantial: identifying the evaluation criteria, establishing the hierarchical structure for

- performance evaluation, collecting data on the performance measures, and developing and providing responses to the questionnaires;
- 2) it could be considered complicated by the managers and difficult to understand; and
 - 3) although the method is systematic, it still requires managers to make subjective judgments about the interpretation of qualitative criteria;

Furthermore, Dyer (1990) and others have suggested that the AHP methodology itself has internal weaknesses such as the lack of an axiomatic foundation and the fact that its questionnaires, as in all 'survey-type' methodologies, may be ambiguous. Also, the ratio scale used to measure the intensity of preferences may not be the best measurement tool for the purpose. Finally, the most critical limitation is that the relative ranking of the original alternatives may be reversed when an 'identical' alternative is added to the list. Saaty (1986), Harker and Vargas (1987, 1990) and Saaty (1990) have all attempted to show that these alleged limitations do not detract from the usefulness of the AHP.

Despite these limitations, AHP gives management flexibility in rating departmental or divisional performance. As such AHP provides a management aid in interpreting and using multiple criteria, making the AHP a potentially powerful tool in the planning and performance measurement process of any organization.

The major contribution of this paper, however, is on the proposed different use of the BSC. Whereas all previous researches on the application of the BSC model to various organizations propose the adoption of measures for the four perspectives proposed by Kaplan and Norton (1992,1993), we adopt a different stand. Basing our logic to the theoretical articles of the founders of the BSC, we propose that a proper BSC should consist of the outcome measures (objectives) of the two perspectives only, the financial and the customers, and these measures should be followed by their performance drivers (sub-measures) which mainly come from the third perspective, the internal business processes.

We stressed the point that the BSC is much more than a collection of critical indicators (measures and sub-measures) organized into several different perspectives. These measures should consist of a linked series of objectives and measures that are both consistent and mutually reinforcing. A properly constructed BSC should tell the story of the business unit's strategy. It should make the relationships among objectives and measures in the various perspectives explicit so that they can be managed and validated. Moreover, a BSC should contain both generic measures or outcomes and performance drivers. Generic measures reflect the common goals of many strategies, as well as similar structures across industries and companies. On the other hand, the performance drivers are the measures that tend to be unique for each business unit.

Finally, we demonstrated that using the AHP, it is possible to link the performance measures of a BSC to a firm's mission (overall goal) and strategy. In particular, we showed how a firm could employ this method to weight the relative importance of its performance measures in terms of its overall goal. With this link, we were able to develop a composite index of the firm's performance measures. This index facilitates the measurement of the firm's progress in pursuing its overall goal and in tracking the effectiveness of a particular business strategy or division. We believe this critical capability enhances the value of the BSC and, thus, increases the likelihood that management will use the BSC as a decision-support tool on an ongoing basis.

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