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# DEVELOPING A PERFORMANCE MEASUREMENT SYSTEM INTEGRATING ECONOMIC VALUE ADDED AND THE BALANCED SCORECARD IN PHARMACEUTICAL COMPANY

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**Abstract.** The purpose of this paper is to show how the balanced scorecard (BSC) could be a prominent innovation in strategic performance measurement systems in a pharmaceutical industry. The BSC implementation through economic value added (EVA) has led to increase in the value of the company using analytical hierarchy processing (AHP) method. Since the core idea is to implement BSC into pharmaceutical company, the research described here helps to develop an individualized balanced scorecard, combined with EVA, which brings additional value to a company. The paper has practical relevance for the effectiveness of the balanced scorecard inside a pharmaceutical company, particularly as it is gaining additional importance due to the fact that the concept brings increasing value for a company. Pointing out the importance and particularity of industry, where balanced scorecard and economic value added are implemented, the paper is especially of interest for managers of pharmaceutical company and related ones.

**Keywords:** Balanced Scorecard (BSC), Economic Value Added (EVA), analytical hierarchy processing (AHP), pharmaceutical company, performance measurement, strategic decision-making.

## 1. Introduction

In modern competitive global economy, it is more important than ever to understand the process of value creation in the organization. The need to manage with a high level of customer focus, a clearer understanding of core business processes, the necessity of motivation and commitment of employees, the need for change on a continuous basis, and effective strategy implementation have led to the increased transparency of measuring business performance and the value drivers.

Owners generally have a pretty clear picture of the direction in which they want their company to go, but their strategy to achieve their goals is not very clear to anyone else in the company. Research shows that most companies fail to execute strategy successfully (Kaplan, Norton 2001). Thus, it appears promising to use the balanced scorecard methodology to integrate environmental and social management with the general management of a firm (Figge *et al.* 2001a, 2001b).

Kaplan and Norton (1992) presented the balanced scorecard (BSC) as a performance measurement tool. The founding idea of the concept is that measures should be chosen in a way that gains the active endorsement of the senior managers of the organization, reflecting both their privileged access to strategic information, and the importance of their endorsement and support of the strategic communications that may flow from the balanced scorecard once designed. The balanced scorecard has gained prominence as a way of integrating financial and non-financial performance measures into an overall control system (Atkison *et al.* 1997, Hoque, James 2000, Malina, Selto 2001, Simons 2000).

In healthcare, the balanced scorecard is the meal for today, with consultants advocating their management accounting system using the new miraculous treatment (Aidemark 2001). For many years the pharmaceutical industry is a good example of detailed performance measurement system (Pieper 2005). This industry has a specific balanced scorecard implementation, which is not relevant for other industries.

Managers of many companies seek to improve profitability in a competitive environment; profitability is needed for increasing value of a company. This is the reason of implementing value-based measures, one of which is Economic Value Added (EVA). Companies should switch beyond narrow metrics to the usage of EVA like a strategic decision tool; this will help in improving of implementation of value based management (VBM). The process should include identified value drivers, integration of budgeting with strategic planning, and development of a sophisticated performance measurement system. This is the objective of the paper.

The work focuses on a complementary system of managerial metrics, which will be created; the system will give opportunity to link EVA system to the Balanced Scorecard (BSC) through analytical hierarchy processing (AHP). The need for knowledge of value management is discussed. The balanced scorecard is presented as a mechanism for identifying value drivers and drilling down into

the operations of the pharmaceutical company. Afterwards, these two complementary frameworks are combined through the AHP methodology, to develop a comprehensive measurement system for assessing the overall performance of pharmaceutical company.

## 2. Integrating EVA and the Balanced Scorecard

Although the balanced scorecard was not exactly created for EVA, the framework has proven to be highly supplementary to it (Young, O'Byrne 2001). In real cases, EVA and BSC must be presented as a consolidated system, describing a continuum going from leading indicators such as product innovation, employee productivity, customer satisfaction and loyalty, company's brand, product quality, etc. to lagging indicators such as financial measure EVA. The strength of EVA is that it focuses on main vision of a company to create value. The strength of BSC is that it focuses attention of managers on the main key directions for that value creation.

Very often companies invest in decision support tools such as the balanced scorecard and the EVA but do not use them effectively, mainly because managers do not know how adapt them directly to ongoing operations. A strategic map organizes performance indicators in a causal chain. The strategic map shows that indicators could be placed as a continuum. A leading indicator of EVA could be a customer satisfaction, but at the same time it can be a lagging indicator of feedback. Otherwise, better feedback improves customer satisfaction, which leads to higher sales and better payments of receivables, which in turn leads to higher EVA. While feedback is a leading indicator of customer satisfaction, it could be a lagging indicator of process and product quality. Process and product quality, in such case, are lagging indicators of employee skills and suggestions. The balanced scorecard centers attention of managers on such causal relationships, going from leading indicators to higher EVA.

The aims of the approach are to satisfy four pharmaceutical company's requirements regarding balanced scorecard perspectives:

1) Strategy: Determine strategic value of pharmaceutical company. One of the historical challenges in the pharmacy system has been the identification and collection of meaningful data to measure an organization's progress towards the achievement of its strategic goals and the concurrent alignment of internal operating practices with this strategy (Devitt, Klassen, Martalog 2005). This strategic value to the pharmaceutical organization still remains unanswered and needs further consideration.

2) People: The recognition that the success of the pharmaceutical organization depends on how well its people (healthcare professionals) are valued. Studies by Mills and Spencer (2005) assert evidence that the transformation of identities of unit members from their job description to their accomplishments improved both the efficiency of the unit and its morale – as well as resulting in cost savings. A similar approach must be adopted and included as an important component of the pharmaceutical business model together with an evaluation of the pharmacy service taskforce (Moullin 2004).

3) Process: Apply the pharmaceutical business model to effectively prove added efficiency and productivity within the pharmaceutical organization when a remote customer monitoring system is deployed, and to prove that pharmacy costs may potentially be reduced. A pharmaceutical business model must encompass all aspects of a healthcare framework that is directed towards a metric-based strategic plan with measurable relationship across the internal and external pharmaceutical organization processes – from a top-down management view of how policies, procedures, processes and operations should serve the pharmaceutical organization to the bottom-up view of how the customer processes are made more efficient further ensuring that IT processes become more cost efficient in the future ongoing support environments (in source, outsource or managed services). There is currently no way of determining the ongoing support costs for the pharmaceutical organizations.

4) Technology: Pharmaceutical company's primary purpose is to provide qualified medicines/drugs to customers who are in some way isolated from the specialized care they deserve. The technology of production should also be improved and the cost reduced through technological progress. Company's infrastructure and technology, medical applications and services, user acceptance, education and training, product and applications/services development and service provision aspects must also be considered.

These four pharmaceutical company requirements would further need to be linked to measure systems from a Strategy, People, Process and Technology performance perspective.

The analytical hierarchy processing (AHP) framework is applied in order to connect BSC performance measures to overall company performance and achieve equilibrium about the relative importance of these measures (Pineno 2000). The AHP model is adapted for business problems, and

is especially useful for allocating resources, planning, analyzing the impact of policy and resolving conflicts (Saaty 1996).

## 3. The AHP-Based Valuation Framework

AHP is a multi-criteria decision support system, developed by Saaty (1980, 1990) and discussed by Podvezko (2009), which allows a decision maker to structure a complex problem in the form of a hierarchy. Generally, the AHP methodology is a method, which splits out a sophisticated case into several components, organizes these components (variables) into a hierarchic order, settles numeric values to subjective judgments on the relative importance of each variable, and synthesizes the judgments in order to identify which variables have the highest priority and should be acted up to influence the outcome of the situation. AHP consolidates personal values and judgments in a logical way.

It relies on different factors such as logic, sense and vision for structuring the hierarchy of a problem and on these factors to provide judgments about the relative rankings.

An important element of AHP method is that it provides an effective structure for making group decisions by setting a discipline for the group's thought processes. This benefit is ideal for strategic planning, additionally, the necessity of setting a numeric value to each variable of the problem helps managers to maintain strategic patterns and to reach a right conclusion. The consensual nature of group decision-making improves the consistency of managers' judgments and strengthens the validity and reliability of the AHP as a decision-making tool.

The goal is the main point of the hierarchy and it is the first level. The criteria are the next step, and it is a second level. A third level of the hierarchy could also exist, depending on the case. As an example, a set of sub-criteria must be defined for evaluation of the issues related to company's activity. A scale of ratings is specified for two levels: the criteria and sub-criteria levels. The alternatives, which should be evaluated, are the last step in AHP method, they compound the final level.

Some applications of the AHP model have been already made in a plenty of different problems in order to improve decision making process (Hogan, Olson 1999, 2004, 2006; Ishizaka, Lusti 2004; Travana 2004). The most important aspect of the AHP model includes the ability to reconcile sophisticated quantitative and qualitative information in the process of decision making. Furthermore, the simplicity of use and ability to adjust the consistency into the decision-making process bring additional benefits of AHP method.

Hogan, Olson and Sillup (2009) propose that there are four general steps required to implement the AHP. First, the decision maker identifies the criteria and determines their relative importance in achieving the goal and identifies the sub-criteria and determines their relative importance in achieving the related criterion. Second, the decision maker determines the relative importance of the ratings categories for each of the sub-criteria. Third, the alternatives are evaluated in the context of each of the ratings categories. Finally, the results are synthesized to compute the relative contribution of the alternatives in achieving the goal.

## 4. Integration of EVA and BSC using AHP in a pharmaceutical company

Pharma company is a German subsidiary of the Italian Group, which has been occupying a leading position in the Italian pharmaceutical market for many years. The company, which was formed in 1886 and is headquartered in Florence, was developed over the generations to become a global, owner-managed pharmaceutical company.

A company pursues two strategic objectives: research and internationalization. Both endeavors enable innovative products to be used successfully to the satisfaction of patients throughout the world. The Italian Group enjoys an outstanding reputation worldwide as an efficient and reliable partner. This applies both to the development of new drugs and to the communication of scientific insights.

A balanced scorecard needs to be used to realize the full value of a pharmaceutical company. By Schneiderman (1999) a balanced scorecard fails when company management is not familiar with information from identified relevant performance measures. As noted by Jennings, Graham (1997), the balancing of long-term development with short-term requirements for survival is a particularly important issue for companies – failing to get the budget process aligned with the strategic goals of the enterprise can make achieving this balance harder.

In order to implement a balanced scorecard system to this company, some steps of implementation should be fulfilled.

*Strategic Analysis.* At the beginning, the group of managers developing a balanced scorecard in pharmaceutical company conducted a SWOT analysis and reflected on the company's current strategy and performance. The group thought that pharmaceutical company has such strengths: a large

developed network in different regions; many networks in economically developed countries; largest international presence amongst competitors; profitable since creation of a company; and a forward-looking leadership. The significance of clearly identified objectives is mentioned by Lingle, Schiemann (1996), who warns from so named "fuzzy objectives", because this is a reason for shortage of implementation and targeted results.

The group weighted on the company's mission: "To be a leading international pharmaceutical company committed to augmenting stakeholders' value through concern, care, and competence." They agreed that the mission clearly focused on creating value for all stakeholders and thus provided a clear strategic direction.

Through a brainstorming session, the group decided on several strategic topics. One topic that all managers agreed about and considered as top priority was: increasing the total value and prestige of a company.

*Strategy Mapping.* The managers carried out a comprehensive strategy mapping of the strategic topic. Strategy mapping, as it is described by Pandey (2005), is a pictorial description of the strategy and its elements. The map also shows the linkages and interaction between various variables. Norton and Kaplan (2001) assume that if a strategy is presented systematically in a map, the chances of company success increase. Strategic mapping helps in integrating and linking all elements and variables with each other and with the organization's overall objectives. Balanced scorecard designs in pharmaceutical companies normally include an elaborate process for identifying measures in order to give clear picture of company's direction towards achievement of its goals (Olve, Roy, Wetter 1999).

The pharmaceutical company's vision is to implement management system into the company and be recognized by stakeholders and interested parties as a leading pharmaceutical company by achieving a superior level of management for employees, consumers and customers. The main strategic plans of pharmaceutical company are: (1) to maintain existing market share and to invest more in different markets; (2) to develop economically good platform for company's future; (3) to reach growth of sales and to hold leading position; and (4) to develop and maintain relationships with governmental, regulatory and interested party groups protecting the shareholder's interest.

According to Pharma company's strategic plan, there are four main objectives: to increase sales growth, profitability, customer and employees' satisfaction and their retention. The AHP framework was used by management to distinguish the relative importance of each of these strategic drivers and develop an index to predict overall pharmaceutical company performance.

**Table 1.** Scorecard for pharmaceutical company

| | *High performance Organization* | *Systematic Execution & Implementation of system requirements* | *Stakeholder service excellence* | *Excellence in financial performance* |
|---|---|---|---|---|
| *Objectives/Critical Success Factors* | – Attract key employees for a company;<br>– Provide health working environment;<br>– Increase team work and spirit of a company. | – Allow for easy storage, access, compilation and dissemination of data, know-how and experience;<br>– Ensure good communication channels. | – Provide feedback and recommendations to internal stakeholders regarding performance and compliance with guidelines and standards to improve the business;<br>– Insure all information is presented in-time, accurately and thoroughly. | – Improvements in operational performance;<br>– Support appropriate targets to achieve business needs; |
| *Key performance* | – Employee satisfaction rate;<br>– Training compliance rate;<br>– Successful job rotation. | – Audit recommendation implementation score;<br>– Information sharing score. | – Business improvement rate;<br>– Management satisfaction rate;<br>– External rating score. | – Risk management score;<br>– Expense spending control;<br>– Performance score;<br>– Target achievement rate. |

**Table 2.** Pharmaceutical company AHP-Balanced scorecard framework

| *Maximize Stockholder value (EVA= 1 mil. EUR)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Objective 1 Profitability* | | *Objective 2 Sales growth* | | *Objective 3 Customer retention and satisfaction* | | *Objective 4 Employee retention and satisfaction* | |
| Customer perspective | | Financial perspective | | Internal business perspective | | Learning and growth perspective | |
| Retention of customers | 98.10% | RONA | 15.10% | Out-of-stock rate | 3.00% | Employee retention | 89.10% |
| Revenue from value-added partnerships | 29.40% | Sales growth | 25.40% | Accuracy in delivery order | 99.10% | Employee suggestions | 21.2 % increase |
| Sales from new accounts | 22.30% | Inventory turnover | 14.1 times | Expired validity medicines rate | 1.20% | Employee training days | 5.0 days /person |
| On-time delivery | 98.10% | WACC | 9.00% | Accounts payable | 18.4 days | | |
| | | Accounts Receivables | 21.0 days | Revenue from new products | 6.40% | | |
| | | | | Broken packages rate | 2.30% | | |

*Point 1 – to construct AHP model connecting pharmaceutical company's EVA mission and objectives with the balanced scorecard*

An AHP model must have an exact goal, in case of pharmaceutical company it is to achieve an EVA target of 1 million Euros (the currency is Euros, because the mother-company is located in European Union and all consolidated results are presented in Euro currency). A hierarchy is constructed to link the goal with alternatives. Alternatives can be viewed as strategic options for achieving the goal. Afterwards, the criteria are selected. They represent the measures used to access the performance of financial and non-financial drivers of value in pharmaceutical company (Ponikvar, Tajnikar, Pušnik 2009). This hierarchy is illustrated in Table 1 and is identified in such way:

1. Goal: Maximize stakeholder and shareholder value by achieving an EVA of 1 million Euros.

2. Strategic Alternatives: increase profitability, grow in sales, satisfy customer needs and satisfy employees' expectations as well as to retain number of customers and employees in a company.

3. Criteria: Each key performance measure is located under each perspectives of balanced scorecard. To relate each measure with its underlying balanced scorecard perspective is one method how to be sure that each perspective has been taken into account in the process of strategy development and performance management.

*Point 2 – the weights of each key performance measures should be selected using AHP model*

AHP models need twosome comparisons to evaluate the relative importance of each of the strategic objectives and the importance of each of the criteria in meeting the EVA goal and each strategic objective. Such comparisons are presented by several modes, including verbal, numerical and graphical approaches. The results are summarized in table 2.

Company's management team met over the course of several weeks to debate the relative priorities of these value drivers. Management's twosome comparisons yielded differential weights for the four strategic objectives as well as the four components of the balanced scorecard. The weights are based on management's evaluation of the significance of the performance measure of pharmaceutical company's unique competitive environment. Customer and sales oriented objectives and measures were higher priorities than financial measures.

It was important to grow sales and to retain its customers in order to enhance pharmaceutical company's ability to capture competitor's customers.

Table 2 summarizes the 18 key performance measures as calculated by the AHP model. The weights relate the relative importance of each performance measure for pharmaceutical company's efforts to meet its overall goal of achieving an EVA of 1 million EUR. Each objective has its own relative importance. The targeted values are summarized in a table 3 above to have an opportunity to track company's progress.

**Table 3.** Pharmaceutical company's relative priorities

| *Balanced scorecard perspectives* | *Strategic objectives* |
|---|---|
| 35.2 % Customer perspective | 34.2 % Sales growth |
| 27.8 % Financial perspective | 27.8 % Customer satisfaction/Retention |
| 25.9 % Internal business perspective | 27.3 % Profitability |
| 11.1 % Innovation & learning | 10.7 % Employee satisfaction/Retention |

*Point 3 – to use key performance measures for creating an index to predict overall pharmaceutical company performance*

Pharmaceutical company managers decided to create three possible alternatives of company's performance, depending on different targets, set by a company. Three scenarios were given and, quantifying the relative effect of each change, managers constructed an index to predict the company's progress toward its strategic targets. Evaluated AHP measures can show possible company's problem areas, if the measure does not meet the target; and they also can indicate what company will do well, if the targeted goal is reached.

The maximizing criteria imply that, if their values are growing, the situation is getting better, while for minimizing criteria this means a worsening situation. The integration is achieved by normalization which helps to convert all the criteria values into non-dimensional, i. e. comparable quantities. Quantitative methods quantitatively evaluate each alternative determining the differences in the values obtained for the alternatives considered (Ginevičius 2008).

**Table 5.** Comparison of performance alternatives with target of pharmaceutical company

| *Company performance measure* | | | *Target* | *AHP weight* | *Alternative 1* | | *Alternative 2* | | *Alternative 3* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *% of target* | *Performance index* | *% of target* | *Performance index* | *% of target* | *Performance index* |
| *Financial perspective* | | *Ai* | *27.80%* | | *26.30%* | | *27.74%* | | *26.24%* | |
| 1 | RONA | A1 | 15.1% | 4.0% | 113.90% | 4.55% | 88.07% | 3.52% | 104.63% | 4.18% |
| 2 | Sales growth | A2 | 25.4% | 7.2% | 58.66% | 4.22% | 80.70% | 5.81% | 123.62% | 8.90% |
| 3 | Inventory turnover | A3 | 14.1 | 5.2% | 71.63% | 3.72% | 99.29% | 5.16% | 69.50% | 3.61% |
| 4 | WACC | A4 | 9.0% | 6.3% | 121.11% | 7.63% | 137.77% | 8.68% | 93.33% | 5.88% |
| 5 | Accounts Receivable days | A5 | 21.0 | 5.1% | 120.95% | 6.16% | 89.52% | 4.56% | 71.90% | 3.66% |
| *Customer perspective* | | *Bi* | *35.2%* | | *35.11%* | | *35.07%* | | *30.96%* | |
| 6 | Customer retention rate | B1 | 98.1% | 11.8% | 99.59% | 11.75% | 100.81% | 11.89% | 97.24% | 11.47% |
| 7 | Revenue from Value-added partnerships | B2 | 29.4% | 6.9% | 135.71% | 9.36% | 120.40% | 8.30% | 51.36% | 3.54% |
| 8 | Sales from new accounts | B3 | 22.3% | 8.1% | 68.16% | 5.52% | 81.16% | 6.57% | 96.41% | 7.80% |
| 9 | On-time delivery | B4 | 98.1% | 8.4% | 100.91% | 8.47% | 98.77% | 8.29% | 96.84% | 8.13% |
| *Internal business perspectve* | | *Ci* | *25.9%* | | *26.33%* | | *27.85%* | | *32.75%* | |
| 10 | Out-of-stock (%) | C1 | 3.0% | 5.8% | 43.33% | 2.51% | 103.33% | 5.99% | 80.00% | 4.64% |
| 11 | Accuracy in delivery order (%) | C2 | 99.1% | 6.4% | 99.49% | 6.36% | 97.27% | 6.22% | 91.52% | 5.85% |
| 12 | Expired validity medicines (%) | C3 | 1.2% | 4.9% | 208.33% | 10.20% | 133.33% | 6.53% | 258.33% | 12.65% |
| 13 | Accounts payable days | C4 | 18.4 | 3.2% | 76.08% | 2.43% | 115.76% | 3.70% | 164.67% | 5.27% |
| 14 | % of revenue from new products | C5 | 6.4% | 3.7% | 87.50% | 3.23% | 112.50% | 4.16% | 50.00% | 1.85% |
| 15 | Broken packages (%) | C6 | 2.3% | 1.9% | 82.60% | 1.57% | 65.21% | 1.23% | 130.43% | 2.47% |
| *Innovation and learning perspective* | | *Di* | *11.1%* | | *9.38%* | | *10.23%* | | *9.82%* | |
| 16 | Employee retention | D1 | 89.1% | 4.7% | 102.58% | 4.82% | 98.42% | 4.62% | 107.07% | 5.03% |
| 17 | Employee suggestions (% increase) | D2 | 21.2% | 2.9% | 48.58% | 1.40% | 24.52% | 0.71% | 83.01% | 2.40% |
| 18 | Employee training days | D3 | 5.0 | 3.5% | 90.00% | 3.15% | 140.00% | 4.90% | 68.00% | 2.38% |
| *Baseline performance index* | | | *100.0%* | | *97.12%* | | *100.91%* | | *99.78%* | |

The essence of multi-criteria evaluation can be clearly shown by the so-called Simple Additive Weighting (SAW) method expressed as:

$$S_j = \sum_{i=1}^{m} \omega_i \tilde{r}_{ij}, \quad (1)$$

where $S_j$ is the value obtained in multi-criteria evaluation of the *j-th* alternative; $\omega_i$ is the *i-th* criterion weight; $\tilde{r}_{ij}$ is normalized value of the *i-th* criterion for the *j-th* alternative.

As can be seen from the formula (1), the normalized values of the criteria are used to determine the multi-criteria evaluation (Ginevičius, Podvezko 2008; Ginevičius 2007).

The table 5 suggests each possible alternative's performance to target measure using AHP-driven performance index, calculated by SAW method.

If pharmaceutical company's managers decide to choose Alternative 1 for strategic planning, the overall performance will be accomplished only by 97.129 %. Only one perspective perfectly reached the target, other performance measurement perspectives fell short of its target. By Alternative 1 such financial measures as RONA (13.907 % better than targeted), WACC (21.111 %) and Accounts Receivable days (20.952 %) are even better than they were targeted, the better results are also presented by such customer perspective measures: revenue from value-added partnerships (35.714 %) and on-time delivery (0.917 %), only one measure of internal business perspective is twice better than it was targeted – expired validity medicines index (108.333 % increase), similarly and with innovation/learning perspective measures – employee retention measure brings better results than targeted (2.581 %). Alternative 1 has only several rates, which are in bad condition, this is an employee suggestion rate (-51.415 %), some decisions should be make to improve this area.

The Alternative 2 suggests that 8 measures will bring better performance than it was targeted, they are: WACC (37.778 % better performance), customer retention rate (0.815 %), revenue from value-added partnerships (20.408 %), out-of stock rate (3.333 %), expired validity medicines index (33.333 %), accounts payable days (15.761 %), revenue from new products (12.500 %) and employee training days (40.000 %). So, choosing this alternative, not too many measures will achieve the main target, but the main attraction is that the most weighted measures reach the target and this brings the real value increase to performance index. Some measures indicate poor future results, it means that managers could pay attention to the areas where the results are worse, these areas include employee suggestion increase in a company (-75.472 %), broken packages (-34.783 %) and others. The overall performance index of Alternative 2 is 100.915 %, it is even better strategic choice than the target.

The last choice is Alternative 3 – the performance index of this alternative is 99.784 %, it is a little bit higher than Alternative 1, but less than it is targeted. Target will be achieved by RONA (4.636 % greater than targeted), sales growth (23.622 %), expired validity medicines (158.333 %), accounts payable days (64.674 %), broken packages (30.435 %) and employee retention (7.071 %). The areas, where some changes should be made are concerning revenue from value-added partnership (-48.639 %), revenue from new products (-50.000 %) and employee training days (-32.000 %).

Furthermore, a value cycle of pharmaceutical company should be created (Fig. 3), showing the process of value creation in a company. The first step is to understand and create company's main vision, afterwards, the direction should be made towards second step – strategic mapping. Managers of a pharmaceutical company had decided upon the priorities of balanced scorecard perspectives and strategic objectives. When the most important fields were clarified, the pharmaceutical company has invested in different business operations, such as people, process, customers and financial operations. Afterward, some performance results appear, and these results should be measured according to the value, which was brought to the pharmaceutical company after investment. In the case of pharmaceutical company the value is measured by economic value added (EVA), which is integrated in balanced scorecard perspectives through AHP methodology. So, the performance is measured and the results are calculated, it means that based on obtained results, company's managers can make some conclusions and to learn and know more about some failure or, on the contrary, some gains.

This is the next step in the value cycle of a pharmaceutical company – knowledge and learning. After the analysis of obtained results, managers establish new vision of a pharmaceutical company and the process circulated again and again.

And, finally, in order to understand the really best strategic choice for pharmaceutical company's value, Economic Value Added should be calculated according to results of performance (Table 6).

So, taking into account the fact that the main goal was to create a comprehensive measurement

system for assessing the overall performance of pharmaceutical company through combining two complementary frameworks (EVA and BSC) through the AHP methodology, it can be proved, that the best alternative is second one, because it brings the best results for a pharmaceutical company, with value and performance increase. The increase in economic value added is 0.915 %.

**Table 6.** EVA according to alternative performance results

| | *Target* | *Alternative 1* | *Alternative 2* | *Alternative 3* |
|---|---|---|---|---|
| *EVA (EUR)* | 1000000 | 971291.30 | 1009148.63 | 997841.73 |
| *Difference (EUR)* | | -28708.70 | 9148.63 | -2158.27 |
| *Difference (%)* | | -2871% | 0.915% | -0.216% |

## 5. Conclusions

1. The balanced scorecard is a mechanism for identifying value drivers and drilling down into the operations of the pharmaceutical company, whereas economic value added measures the created value for a company. The analytical hierarchy processing methodology helps to combine these two frameworks in order to develop a comprehensive measurement system for assessing the overall performance of pharmaceutical company.

2. The work has introduced a new framework for a pharmaceutical company to improve the implementation of value based management by adopting balanced scorecard in order to identify value drivers and develop a quantitative measurement system relating the pharmaceutical company's objectives of maximizing shareholder value.

3. AHP valuation framework improves the company's capacity to predict strategy implementation on a real-time basis through increased timeliness and accuracy which gives the better opportunity to improve company's performance and to create value for future.

4. The selected Alternative 2 brings additional value of 0.915 % more than it was targeted by 1 000 000 EUR, others give a negative effect on pharmaceutical company's value, because they decrease it. Alternative 1 diminishes by -2,871 % and it is 28708.70 EUR in currency equivalent, Alternative 3 by -0.216 %, what is equal to 2158.27 EUR.

5. The value cycle for pharmaceutical company is a good strategic decision. After selected vision, balanced scorecard and strategic objectives are designed. Another step is investment to business operations, appealing to the selected objectives, after which is performance and value added measurements. Through this analysis, knowledge and learning appear for the managers. Based on this, they create new vision for a pharmaceutical company and the value cycle repeats more and more.

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