

Understanding and using Balanced Security Scorecards

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ABSTRACT

In recent years, information security became more and more important due to the increased use and continuous development of information technologies. Especially companies have a great need to guarantee information security to customers, partners and within the firm. Today, it takes a great role in achieving business goals and thus it is essential to include this aspect in strategic planning and decision making. For this purpose, a Balanced Security Scorecard could be adopted by the IT department to communicate their goals to the upper management and align its strategy with the overall vision of the company. This security metrics is deduced from a business framework called Balanced Scorecard which considers financial, customer, internal business, and innovation and leading factors for performance measurement and long-term success. These perspectives are transferable to information security issues and encourage a holistic view of the people and processes that underlie sustainable success. However, this approach is strongly unfamiliar to IT employees and differs from normally used methods, which involves uncertainty and acceptance problems. Nevertheless, this framework is required to ensure the realisation of information security objectives in the context of the company's business strategy.

Keywords

Balanced Scorecard (BSC), Balanced Security Scorecard (BSSC), information security, performance metrics

1. INTRODUCTION

The Balanced Scorecard (BSC) is a business framework that has gained popularity over the last eighteen years as a holistic approach to evaluate quantitative and qualitative information with respect to the organisation's strategic vision and goals. Today, this performance metrics is effectively applied in many organisations and was labelled as one of the 75 most influential ideas of the 20th Century by the Harvard Business Review in 1997 [4]. The BSC is often considered as a solely business management tool but in fact it should be used in every business unit and in some cases even on an individual project level to develop a cross-company strategy. Hence, it is not just applicable for such obvious divisions like the marketing or controlling department but also for IT or information and communications technologies. As the paper will show, the BSC is not just a stand-alone performance measurement tool but a strategic performance management system.

Focusing on information security aspects, this paper shows how the BSC can be used within the IT department to assess its own performance as well as to integrate the IT strategy to the business strategy of the organisation as a whole. Starting with a general description of the BSC model and the process of developing a

BSC in a company, this paper gives an idea of how a Balanced Security Scorecard (BSSC) could be derived and set up in concrete terms.

2. THE BALANCED SCORECARD AS A BUSINESS FRAMEWORK

The BSC was given its name by *Arthur M. Schneiderman* [15] who first created this metrics in 1987 for a semi-conductor company as an independent consultant. Nevertheless, the two men who are primarily known as the developers of the BSC are the Harvard professors Robert Kaplan and David Norton who published most of the initial specialist articles which lead to the present-day popularity of the technique. Their first paper "The Balanced Scorecard: Measures that Drive Performance" [7] emerged from a study in which 12 companies were analysed in order to develop an innovative performance measurement system. It was first published in the Harvard Business Review in 1992 and revolutionised the thinking about performance metrics. They introduced a business framework to align business activities to the firm's strategy and to monitor the progress on organisational goals. The traditional way of evaluating a firm exclusively by financial measures of performance was supplemented by operational value drivers to provide an all-encompassing strategic management and control system focusing on the progress of achieving strategic objectives in the long run. This enables a company to link its long-term strategy with its short-term actions. Therefore, Kaplan and Norton defined four primary perspectives that should help managers to focus on their strategic vision:

- Financial
- Customer
- Internal business
- Innovation and learning

These four perspectives create a balance between internal and external measures and show the trade-offs between the identified key success factors. The BSC considers past performance measures, respectively outcome measures, by regarding financial key figures as well as future performance indicators as internal processes and innovation and learning. So a balance between leading and lagging indicators is achieved whereas customer satisfaction can be interpreted in both ways [7]. Referring to this, a fitting comparison from *Martinson* [12] says: "Medical doctors typically examine a patient's health by checking their heartbeat, blood pressure, and the composition of body fluids. Similarly, a few key indicators provide a reliable guide to corporate health."

After Kaplan and Norton sketched the general methodology of the BSC, they wanted to go into more detail and published several related empirical studies, enhancements and of course their most

renowned book “The Balanced Scorecard” (1996). They tried to provide a manual which describes the optimal usage of the BSC. Formally, many companies managed to execute only about 10% to 30% of their formulated strategies which strongly improved in firms that implemented the BSC.

According to a survey executed by *Bain & Company* [13] in January 2009, about 53% of 1,430 questioned international executives regularly use the BSC being the sixth popular management tool.

A lot of research is done concerning representative examples of successful implementations of the BSC. *The Balanced Scorecard Institute* [3] maintains a list of famous BSC adopters including German firms like *Siemens AG*, *BMW* and *Daimler Chrysler* who have succeeded in overcoming strategic problems with the help of the BSC. Many of them introduced this framework over 10 years ago and use it consistently. There are several listings called ‘BSC Hall of Fame’ from different publishers including profit and non-profit organisations as well as governmental institutions. *Balanced Scorecard Collaborative* [2] for example quoted Brisbane City in Australia as a young city on the move owing its success to the long-standing use of the BSC since 1997.

This framework is of course no guarantee for success but it has proven its value [4].

2.1 The four perspectives of the Balanced Scorecard

2.1.1 How does the company look to shareholders?

The **financial** perspective includes the traditional measures of growth, shareholder value and profitability as profit and loss, return on invested capital or earnings before interest and taxes (EBIT) [6]. “Financial performance measures indicate whether the company's strategy, implementation, and execution are contributing to bottom-line improvement.” [7] This perspective is essential to the shareholders of a company and monitors if the

organisation is able to make money, to generate growth and to reduce risk. Even if financial measures are often criticised as only providing a short-term view and causing no operational improvements, they should be employed to give periodic feedback and motivation to the operators [7].

2.1.2 How do customers see the company?

The **customer** perspective inquires the customers’ needs and the success of the company in satisfying those needs. Furthermore, it identifies profitable market segments and target groups that should be addressed in order to stay competitive. The most common measures to accomplish the typical mission statement of delivering value to customers are time, quality, performance and service, and cost. The company has to make out the most important issues to their customers either by a customer survey, by finding the best practice through a benchmark or by experience. After figuring out the main goals, they are specified and translated into specific measures such as customer loyalty, market share or profit per customer [6]. Each company or industry sector might have different measures which could also vary within a timeframe or because of the necessity to quantify the effect of a recent amendment [7]. Kaplan and Norton emphasised that the BSC “is not a template that can be applied to businesses in general or even industry-wide.” [8]

2.1.3 What must the company excel at?

The **internal business** perspective points out the critical processes the company has to excel at to meet the customers’ expectations and reach the financial goals and thus satisfy the shareholders. This perspective also includes a demand for identifying the firms’ core competencies to guarantee continuing market leadership. Typical measures regarding this perspective are order-to-cash ratios, employment of labour or product development cycle time. Hewlett-Packard for example uses breakeven time as a measurement parameter for the effectiveness of its product development cycle [7].

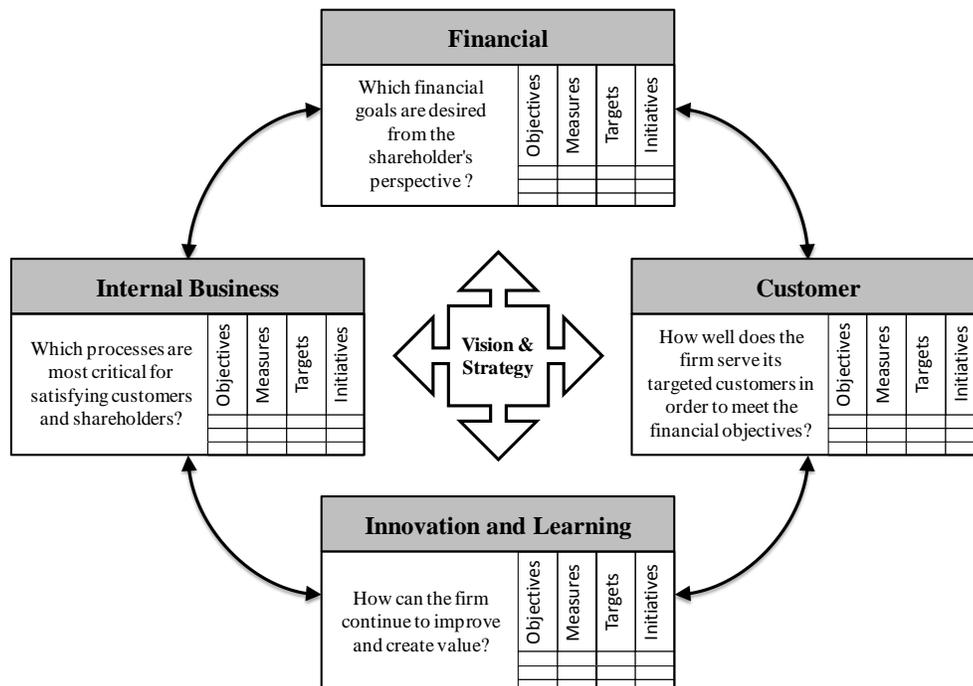


Figure 1: The four perspectives of the Balanced Scorecard

2.1.4 Can the company improve and create value?

The **innovation and learning** perspective shows the critical factors influencing employees, systems and processes in which the company should invest to ensure long-time growth and continuous improvements. It helps to identify the optimal infrastructure and knowledge the people have to be equipped with in order to attain the appropriate objectives. Therefore the parameters that involve competitive success have to be identified while considering that these factors keep changing over time due to global pressure of competition [7]. These factors drive improvements and successes in the other three perspectives. “A company's ability to innovate, improve, and learn ties directly to the company's value. That is, only through the ability to launch new products, create more value for customers, and improve operating efficiencies continually can a company penetrate new markets and increase revenues and margins – in short, grow and thereby increase shareholder value.” [7]

2.2 The cause-and-effect relationships

The vision and strategy of a company is translated in specific objectives (optimum 15-20) which are measured by selected parameters. Hereby it is very important to choose parameters with strong cause-and-effect linkages to the relative objective. Additional to the parameters, the objectives themselves have to be verified to avoid vague formulations and ensure practicable operational goals [6]. Consequently, to develop an applicable BSC for the company, it is essential to involve senior management who has the best overview of the company's strategy and priorities [7].

2.3 Establishing the Balanced Scorecard as a strategic management system

As an evolution to the theoretical idea of the BSC, Kaplan and Norton additionally developed an advisable process to develop and execute an individual BSC for any company. In their paper “Using the Balanced Scorecard as a Strategic Management System” [9] of 1996, they described a spiral of

- Translating the vision,
- Communicating and linking,
- Business planning and
- Feedback and learning

that has to be passed through. This process leads to an applicable management system to implement a value-added, customer-intensive strategy and vision. Thus, after the senior management clarified the overall strategy, the following steps should be executed.

2.3.1 Translating the vision

Translating the vision is the first step of realising a company's vision. The management needs to communicate its goals and measures in terms that employees can understand them and know what precisely they should do. It often occurs that the operators do not know which appropriate action to take and what exactly is expected from them. Therefore, it is recommended to define concrete

- **Goals:** What needs to be achieved?
- **Measures:** Which parameters are used to measure success?
- **Targets:** What is the desirable quantitative value of the chosen measures?

- **Initiatives:** What needs to be done to achieve the goals?

and a status for every objective in every perspective [13]. Another typical phenomenon is that people have different definitions of words and so it is important to clarify the exact meaning of every strategic statement.

2.3.2 Communicating and linking

The process of **communicating and linking** helps to communicate the strategy and procedure to everyone up and down the ladder and also link it to their individual objectives. The key to succeed the managements' objectives is to align the departments and employees with the overall strategy. Therefore, the senior executives prescribe the objectives for the financial and customer perspective of the BSC and let the lower levels of management formulate the other two operative perspectives. Their task is to work out beneficial performance measures and gain a better understanding of the company's long-term strategy by that. This process holds the advantage of more effective measures on the one side and stronger commitment on every management level on the other side. But of course this system needs guidance by the upper management. The responsible employees should be educated and regular informed about their mission and current status. They should also be able to discuss their ideas and results with the senior management at an interim stage. Another method to align operating units and individuals is to let them develop a personal scorecard so that they could set their own goals. Some companies even have the approach to link the compensation of their employees to BSC measures which also aligns them to the strategy but in addition bears high risks if the measures are not chosen right or the data for these measures are not reliable.

2.3.3 Business planning

Business planning is another important aspect that must be considered. Most companies have separate procedures for

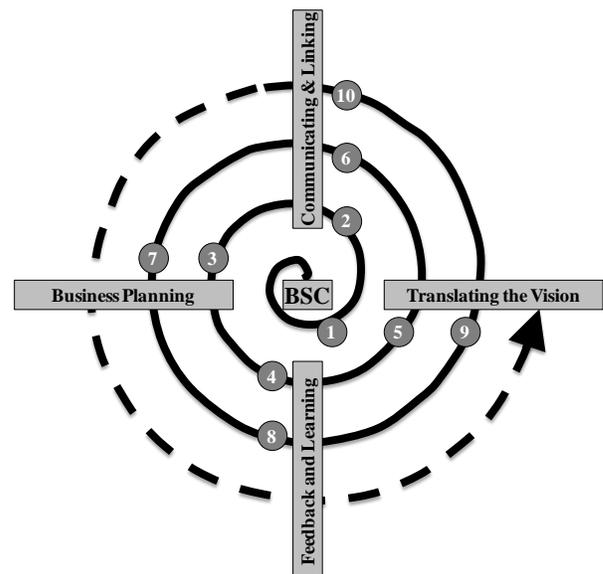


Figure 2: The cycle of developing a Balanced Scorecard

strategic planning and resource allocation. But to ensure that the budgeting system supports the BSC strategy, this process has to be integrated in strategic planning. One way to achieve that would be to set targets for every strategic measure and define short-term

milestones to make financial budgeting on a BSC basis possible and thus move towards a long-term strategy. It can also be helpful to add another column with budget or costs to the description of the particular objective in order to allocate financial resources.

2.3.4 Feedback and learning

Finally, the BSC is accomplished by a constant operational and tactical **feedback and learning** process or in other words strategic learning. The company should periodically ask itself if their strategy was successful and if their measures and initiatives are still valid. Considering changing business conditions and new challenges, some strategy statements or measures maybe have to be adjusted and the hypotheses about cause-and-effect relationships might have to be reconsidered. There are also possible internal reasons like changing or wrong estimated capabilities that could cause the need to improve the BSC and the business planning [9].

2.4 Challenges and benefits of the Balanced Scorecard

What can be avoided using the BSC is the typical control bias of traditional performance measurement systems based on financial aspects. The BSC does not aim to control the employees but provide them an overall view of the company's strategy and vision to encourage them to contribute their share to reach common goals. Although, it can be very difficult to agree on corresponding objectives including the problem that fulfilling everyone's wishes is impossible for a complex organisation. Additionally, the already mentioned ambiguity of some goals can lead to communicational problems.

Furthermore, the BSC forces an orientation towards the future and therefore achieves a long-term perspective. Other metrics often focus on past events and financials which fade out all other aspects of acquiring a successful strategy. The BSC, however, provides a holistic view of all factors that influences organisational performance [7].

One further challenge is to avoid an overdevelopment of the BSC including too much information, details and aspects which results in a loss of utility. An organisation should never lose focus on the essential performance measurements. However, a very high grade of detailed planning can be reached by the employment of BSC software that provides real-time display of performance indicators and an overall framework to manage complexity and communication [4].

According to a survey of 2GC [1], there are more than 100 BSC reporting software packages available provided by SAP (*SAP Business Objects Strategic EPM Solutions*), Oracle (*Oracle EPM System*) and other specialists. About 26% of the surveyed institutions used one of those tools and even 37% employed their existing standard Microsoft office software which could be enhanced by *Microsoft Office Business Scorecard Manager*. The other 37% had their own bespoke software which is very expensive and most often not necessary. Another outcome of this report is that 60% of the respondents rated their BSC as "very" or "extremely" valuable. One dominant reason why the companies were not convinced of the BSC was that they did not update the metrics for years and had not used it on a frequent level.

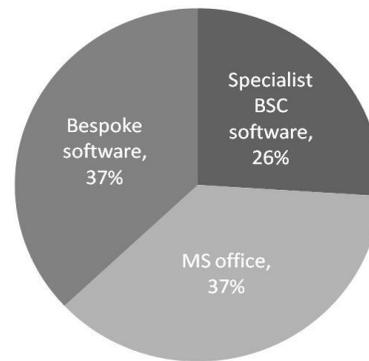


Figure 3: BSC reporting software used [1]

Even if the BSC is a suitable intern method of communicating the strategy of a company, it is not the right way of presenting it to shareholders or the public in general. It contains much too detailed information and therefore gives a deep insight into advantageous competitive structures and future activities. Generally, the main findings and strategic statements should be taken from the BSC but published in another form without confidential company data [9].

3. THE BALANCED SCORECARD AS AN INFORMATION SECURITY METRICS

What makes the BSC interesting for IT measures is that it is very convertible. The organisation is able to choose individual objectives and measures and even rename or add overall perspectives [6]. Consequently the BSC is adjustable for every form of organisation or department and includes potential applications for IT domains. The development of a specific metrics for information security is a part of the communicating and linking process (see 2.3.2). The BSC is a suitable tool to manage an appropriate integration of the IT strategy to the enterprise-standard metrics and hence the company's long-term strategy [10].

3.1 Transferability of the Balanced Scorecard to the domain of information security

At first glance it volunteers to deploy the flexibility of the BSC in order to match it with information security purposes. It would be reasonable to change the four perspectives of the BSC for example to (1) threats, (2) vulnerabilities, (3) identify and access management and (4) policies and compliance. This would adjust the BSC to a more operational metrics matching information security concerns. Even though, this would be a convenient solution for the IT department, this model could not be brought into line with other BSCs and the overall business objectives. The balanced security scorecard (BSSC) should provide a framework that the executives could easily understand and be able to consider in the unified BSC.

Another approach could be to involve an existing security taxonomy like ITIL (IT Infrastructure Library) or ISO 17799. But this would be too complex including too many areas and would be far too profound in the sense of a BSC. It is also not practical to reduce the control areas of the taxonomies to a few main concerns to form a BSSC [6].

Martinsons et al. [11] suggested four adapted perspectives for a BSSC based on Kaplan's and Norton's framework: (1) business value, (2) (internal) user orientation, (3) internal processes, and (4) future readiness. They made this adjustment to the original BSC because it is their opinion that the information security department is an internal service supplier, in the first place.

Nevertheless, as *Jaquith* [6] proposes, this paper will stick to the original perspectives of the BSC and discusses possible relations to the objectives of information security. It will also be described how cause-and-effect measures can be defined from the viewpoint of security and can be assigned in a nontechnical language to financial, customer, internal business and innovation and learning issues.

Even if the connection between information security and the four standard BSC perspectives is not always obvious at first sight, security is only a subsector of the company and influences the success of the whole enterprise, for better or worse. Poor information security can destroy value. Sometimes, it takes just one public breach failing regulatory or data security requirements to lose shareholder confidence and to inhibit future growth. It can even result in costly legal repercussions. Problems with information security are often caused by the fact that security controls are decoupled from the mission of the company. By ignoring the needs of the company's management and workforce, they are forced to use their computers in an unintuitive way causing errors. Consequently, it is necessary to take account of the users on an individual basis and take a holistic, strategic view of information security issues [5]. Information security practitioners have to recognise that they are sales people selling their applications and service to internal staff and external customers.

3.2 Creating the Balanced Security Scorecard

3.2.1 Contributing to the value of the company

Initially focusing on the **financial** perspective, the security efforts have a strong impact on the total revenues of a firm. The ultimate aim of the BSSC would be to improve the overall financial outcomes of the enterprise. So in order to fill the financial section of the BSSC that ought to be developed, the security department should work out:

- How is information security related to the ability to generate revenues?
- In what way does effective security encourages growth by meeting the demands of customers?
- Which investments are tied directly to the security units and can they be reduced?
- Which security controls are necessary to decrease the risk of the organisation?

While the typical objectives of the BSC are the increase of revenues, return on invested capital and profit as well as reducing risk, the BSSC should support those goals by

- Increasing the usage and decreasing the risk of systems that generate revenue. These systems could be applications, tools, servers, people or other infrastructure like for example e-commerce websites, track & trace software, order management systems or payment systems
- Increasing the integrity and decreasing the risk of systems that account for revenue such as spreadsheets, accounting software or enterprise resource planning (ERP) systems

- Reducing security and compliance costs and those costs caused by downtime and other incidents

Typical financial measures would be revenues, return ratios, EBIT, earnings before interest, taxes, depreciation, and amortisation (EBITDA), cost per sales, cash flows etcetera. These parameters are amongst others influenced by security control which could be measured for example by the following key figures based on the above mentioned objectives for information security:

- Order or transaction rate or value
- System uptime, respectively costs of downtimes
- Information security expenses per employee
- Average cost of a security incident
- Cost incurred to deal with known threats
- Number of controls per transaction or accounting event
- Risk indices for those systems [6]

3.2.2 Delivering value-added products and services to end-users

More challenging is the perspective of the **customer**. As customers could easily be defined as the recipient of a product or service in the sense of a common BSC, it is not necessarily transferable to the security metrics because the security aspect is normally not directly sold to the customer. This service is rather employed by internal staff and managers of the company. But this possible redefinition of the customer perspective does not consider the impact that the security system might have to the external customers even if it is indirect. To mix those both views would be also a mistake because the interests of external customers might be diluted. Since the internal users are already included in the internal business perspective it is more important to focus on external users at this point. Hence, the task for the developers of the BSSC is to identify how the security program affects external parties:

- Does the security system encourage the customers to do business with the company or even make it possible at all?
- Does the security system satisfy binding and non binding external requirements?

Consequently, the objectives of the BSC and the BSSC are very similar. The BSC aims at creating added value for the customers with sophisticated products, competitive prices and new innovative products and thereby attract new customers to increase market share. Likewise the BSSC targets

- The increase of attractiveness of products and services and thus the number of customer orders
- The increase of electronic business transactions with customers and partners
- The guarantee of transactional availability and above all integrity
- The preservation of the reputation of the company concerning security criterions. The quality of information security should become a competitive advantage

The customer perspective is typically measured by market share, brand recognition, customer satisfaction, customer loyalty, customer acquisition rates, annual sales per customer or the like. Whereas specific measures for the BSSC could be:

- Number or percentage of customers' wins or losses due to security reasons

- Percentage of strategic partner agreements with documented security requirements
- Volume of electronic transactions
- Cycle time to grant access to company system
- Toxicity rate of customer data
- Downtime of critical operations due to security incidents
- Number of data privacy escalations

Here, the data privacy and protection of customer information plays a very important role. Nevertheless, one should keep in mind, while regarding the objectives and measures for all of the four perspectives, that every company needs to find their individual emphasis and parameters [6].

3.2.3 *Developing efficient and effective internal processes*

The overall goal is to satisfy the customers' needs because this leads to profitability. Emerging from that, the propos of the **internal business** perspective is to reveal supporting operational activities to achieve that goal. Possible objectives of a company related to internal processes are the development of high-quality and innovative products, the reduction of costs, for example materials or logistics costs, the minimisation of cycle time and the optimisation of the customer service. What the security system should provide is:

- Protection of the company's information system
- Access to permitted resources
- Maximal availability of the system
- Technological agility including collaboration with the other business units

The internal processes of the information security team like project planning, application development, and operation and maintenance of current applications have to be optimised. To guarantee an effective and responsive security system at high-quality and lowest possible costs, the following objectives could be deployed:

- Ensuring the safety and security of people and information assets
- Decreasing the number and impact of security incidents
- Maximising cooperation between the security team and other business units
- Identifying security vulnerabilities and control gaps
- Minimising access privileges
- Optimising the effectiveness and reach of security control

These objectives should be monitored by empirical measures like:

- Password strength
- Estimated damage from all security incidents
- Percentage of authorised users accessing security software
- Percentage of communications channels controlled in compliance with policy
- Average time required to address an end-user problem
- Time taken to enroll a new employee
- Ratio of business units shadowed by a security team to security team staff

considering both lag indicators (oriented towards the past) and leading indicators (towards the future) [6].

3.2.4 *Ensuring continuous improvement and preparing for future challenges*

The last perspective that needs to be transferred is the **learning and growth** perspective. It considers the affordable skills and ability of the employees to meet the expectations and ensure future success. So, the objective of a company is to support the skills and knowledge of its workforce and to provide a productive work environment. The performance of the employees strongly correlates with the company culture, quality of internal communication and the tools they are given. To form a flexible and forward-looking security department the following targets should be focused:

- Spread and partly decentralise responsibility for security issues amongst the security team and several business units to consider differentiated user perspectives and gain a holistic view on security problems
- Offer technical training and certifications in order to evolve the required knowledge and skills of the employees
- Provide a safe environment for every business unit
- Be prepared and aware of new threats respectively requirements and develop quick countermeasures and solutions

The concrete objectives for the BSSC should therefore be related to these interests:

- Delegate the responsibility for authoring user activities directly the business units
- Promote the awareness of security threads in the whole organisation and increase collaboration between IT employees and the single business units
- Ensure continual enhancement of the skillset of the IS specialists to prepare them for future and current changes and challenges
- Put effort into the development and update of the applications portfolio and technologies that could be of value to the organisation [11]

Typical measures of the original BSC are training hours per employee, knowledge management metrics, employee productivity or participation in professional organisations. These measures can be directly transferred to information security:

- Percentage of staff with security responsibilities or certain security roles and expertise
- Percentage of employees who have completed security awareness training or professional certifications
- Training and development budget as a percentage of the overall IT budget [6]
- Technical performance of applications portfolio
- Time to implement a regulatory requirement
- Speed of dealing with a new threat [16]

3.2.5 *Implementing the BSSC*

The implementation of the BSSC is similar to the already described process of the traditional BSC. But this time the vision and strategy needs to be clarified, translated and communicated up the ladder to senior management and later, as a second step, to other business units and of course the IT employees. Afterwards, the resource allocation should be oriented on strategic goals and finally the performance should be periodically reviewed including necessary adjustments of the strategy. As mentioned before, it is very important to point out the cause-and-effect relationships of

the targets and possible linkages with other perspectives. The information security strategy should especially be aligned with the overall IT management including budgeting and assigning employees to tasks and roles.

4. CONCLUSION

To conclude, it can be said that the BSSC brings substantial benefits in pursuit of aligning IT and the overall business strategy. The objectives and concerns of information security are formulated in such a way that the non-technical senior management is able to understand it easily and to foresee problems or quickly identify them as they arise. At the same time, the IT department is forced to be mindful of different drivers of its performance outside the security team. It is able to see itself in the context of the company and as an important part of the implementation of a joint strategy. It prevents a deviation of information security management from firm missions. Although, it is very difficult for IT stuff to transcribe their common technical oriented taxonomy and to think in the four perspectives of the economic-oriented BSC framework. The connections between those perspectives and information security issues are not always obvious at first sight and therefore are prone to misinterpretation and overlooking of indirect explanatory variables. But that is exactly why the IT division should work with the BSSC. They need to work out these hidden cause-and-effect relations to reveal possible causes of current problems, needs for adjustments and future chances. ♦

5. REFERENCES

- [1] 2GC Limited (2009): GC Balanced Scorecard Usage Survey 2009, p. 3, including www.2gc.co.uk/resources-swdb (13.01.2011).
- [2] Ascendant Strategy Management Group: Balanced Scorecard Hall of Fame - Brisbane City, www.bscwiki.com/wiki/index.cfm/Balanced_Scorecard_Hall_of_Fame (13.01.2011).
- [3] Balanced Scorecard Institute: Balanced Scorecard Adopters, www.balancedscorecard.org/BSCResources/AbouttheBalancedScorecard/BalancedScorecardAdopters/tabid/136/Default.aspx (13.01.2011).
- [4] Bible, L. / Kerr, S. / Zanini, M. (2006): The Balanced Scorecard: Here and Back, *Management Accounting Quarterly*, Summer 2006, Vol. 7 Issue 4, pp. 18-21.
- [5] Farshchi, J. / Douglas, A. (2010): Information security and the balanced scorecard, *Computer world UK*, Sep. 2010.
- [6] Jaquith, A. (2007): *Security Metrics – Replacing Fear, Uncertainty, and Doubt*, 1st Ed., Addison-Wesley Pearson Education Inc., Boston 2007, pp. 260-289.
- [7] Kaplan, R. S. / Norton D. P. (1992): The Balanced Scorecard – Measures That Drive Performance, *Harvard Business Review*, Jan/Feb92, Vol. 70 Issue 1, pp. 71-79.
- [8] Kaplan, R. S. / Norton D. P. (1993): Putting the Balanced Scorecard to Work, *Harvard Business Review*, Sep/Oct93, Vol. 71 Issue 5, pp. 135.
- [9] Kaplan, R. S. / Norton D. P. (1996): Using the Balanced Scorecard as a Strategic Management System, *Harvard Business Review*, Jul/Aug07, Vol. 85 Issue 7/8, pp. 152-160.
- [10] Keyes, J. (2005): Implementing the IT Balanced Scorecard – Aligning IT with Corporate Strategy, 1st Ed., Auerbach Publications 2005, Chapter 4, p. 92.
- [11] Martinsons, M. / Davison, R. / Tse, D. (1999): The balanced scorecard: A foundation for the strategic management of information systems, *Decision Support Systems*, Vol. 25 Issue 1, Feb99, pp.75, 81.
- [12] Martinsons, M. (2002): The Balanced Scorecard: A Tenth Anniversary Review, Department of Management at the City University of Hong Kong, p. 2, www.cb.cityu.edu.hk/mgt/index.cfm?category=community (19.11.2010).
- [13] Rigby, D. / Bilodeau, B. (2009): *Management Tools and Trends 2009*, Bain & Company, p. 7.
- [14] Scherer, D. (2002): Balanced Scorecard Overview, *Core Paradigm Article*, 17. June 2002, p. 1.
- [15] Schneiderman, A. M. (1992): Analog Devices: 1986-1992 – The First Balanced Scorecard®, www.schneiderman.com (13.01.2011).
- [16] Sethuraman, S. (2006): Framework for Measuring and Reporting Performance of Information Security Programs in Offshore Outsourcing, *ISACA Journal*, Vol. 6, 2006, p. 5.