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## STRATEGY LINKING BSC AND ICT ORGANIZATIONS

**Abstract:** The balanced scorecard (BSC) initially developed by Kaplan and Norton, is a performance management system that enables businesses to drive strategies based on measurement and objectives. The Balanced Scorecard is designed to bring together a company to focus on the structure of the company and to achieve the overall goals. Departmental and individual objectives must be aligned with the strategy through evaluation procedures and incentives. Linking rewards to performance is an important incentive to help an organization achieve its purpose. What the balanced scorecard adds to the traditional means of linking rewards to financial performance is that it takes a more holistic look at the organization. It ensures that the correct criteria are used as a measure of performance before rewards are given. By using the scorecard, businesses will integrate their strategic planning and budgeting processes. This makes sure that the budgets support the strategies of the company. The users of the scorecard pick measures that represent each of the four perspectives, and then set targets for each. In recent years, the BSC has been applied to information-communication technology (ICT). The ICT BSC is becoming a popular tool with its concepts widely supported and dispersed as a result of interest in the real-life applications. In this paper, the development and implementation of a departmental BSC within group of three ICT organizations will be described and discussed.

**Keywords:** Balanced scorecard, ICT organizations, performance measurement, objectives

### 1. INTRODUCTION

Kaplan and Norton (1992, 1993, 1996a, 1996b) have introduced the balanced scorecard at the enterprise level. Their basic idea is that the evaluation of an organization should not be restricted to a traditional financial evaluation but should be supplemented with measures concerning customer satisfaction, internal processes and the ability to innovate. These additional measures should assure future financial results and drive the

organization towards its strategic goals while keeping all four perspectives in balance. The balanced scorecard can be applied to the ICT function and its processes as Gold (1992, 1994) and Willcocks (1995) have conceptually described and has been further developed by Van Grembergen and Van Bruggen (1997) and Van Grembergen and Timmerman (1998). In their survey of corporate governance, Shleifer and Vishny (1997) state that „corporate governance deals with the ways in which suppliers of

finance assure themselves of getting a return on their investment.” They translate this definition into concrete questions: „How do the suppliers of finance get managers to return some of the profits to them?” „How do they (suppliers of finance) make sure that managers do not steal the capital they supply or invest in bad projects?” „How do suppliers of finance control managers?”

The same questions can be worded for ICT:

- How do top management get their CIO and their ICT organization to return some business value to them?
- How do top management make sure that their CIO and their ICT organization do not steal the capital they supply or invest in bad projects?
- How do top management control their CIO and their ICT organization? ICT governance is part of corporate governance and has to provide mechanisms for ICT councils, business alignment and implementation processes (Broadbent, 1998).

Today the complexity of managing an organisation requires managers be able to view performance in several areas simultaneously. The balanced scorecard brings together all the information about the four perspectives in a single management report but, mostly, it focuses the managers attention only on the handful of measures that are most critical, avoiding an overload of information. Looking at an overall company’s performance allows knowing either whether improvements in one area have been achieved at the expense of another or if those improvements are aligned with the future initiatives in the same area or in another.

### **Financial perspective**

The balanced scorecard should encourage the different business units to link their financial goals to the overall company strategy. Many firms adopt the

same set of financial objectives for all the business units because it facilitates the internal communication and the managers appraisal. But when the single divisions adopt different strategies or they are going through different business life cycles, even the financial goals should be adapted to reflect which performances are more important for a strategic area and which are indeed less relevant.

However, the financial objectives have to be used either as final goals for the objectives and the measures of all the others perspectives or to define the economic performance of the strategy. Typical financial goals have to deal with profitability, growth and shareholder value. To overcome their backward-looking focus and their inability to reflect contemporary value-creating actions, often managers conduct shareholder value analysis which forecasts future cash flows and discounts them back to a rough estimate of current value.

### **Customer perspective**

Many companies today have a corporate mission that focuses on the customer. The balanced scorecard requires that managers translate their general mission statement on customer service into specific measures that represent the factors that are very important to customers.

Basically, there are two kinds of measures that reflect the distinction between outcomes and performance drivers. Included in the first set of variables are : customer satisfaction, customer loyalty, new customer acquisition, customer retaining and customer profitability. In the second set of variables, the performance drivers, are included : qualitative features of a product/service, customer relationship and brand reputation.

### **Internal business process perspective**

Customer-based measures are important, but they must be translated into measures of what the company must do

internally to meet customers expectations. Managers need to focus on those critical internal operations that enable them to satisfy customer needs. Traditionally, performance appraisal systems were based on the single responsibility units and not on integrated business processes. With the balanced scorecard both the objectives and measures for this perspective are drawn by explicit strategies aimed to satisfy shareholders and customers expectations. This kind of top-down process enables finding out new critical operations and competencies in which the company must excel. To achieve goals on cycle time, quality, productivity and cost, managers must devise measures that are influenced by employees' actions. Thereby, even employees at lower levels in the organisation have clear targets for actions, decisions and improvement activities that will contribute to the company's overall mission.

#### **Innovation and Learning perspective**

Once the company has defined which financial measures fit its business, has focused its strategy on the customer and has found out which are the most critical internal processes, it has to set up the infrastructure that supports the whole system. Here infrastructure means the set of organisational capabilities represented by the human capital and the information system. Without long-term investments on the human resources, on the research and development, and on the technologies, competitive advantages achieved in the customer and internal processes perspectives are likely to be kept in the short-term.

Only through continuous improvements related to the innovation and learning capability may a firm be able to launch new products, to penetrate new markets, to create more value for customers and shareholders, in short, to grow effectively.

## **2. COMPONENTS OF ICT BSC**

Each of BSC perspectives has to be translated into corresponding metrics and measures that assess the current situation. These assessments need to be repeated periodically and aligned with pre-established goals and benchmarks. Essential components of the ICT BSC are the cause-and-effect relationships between measures. It enables the connections between the measures to be clarified in order to determine two key types of measures: outcome measures and performance drivers. A well developed ICT scorecard contains a good mix of these two types of measures. Outcome measures such as programmers productivity (e.g. number of function points per person per month) without performance drivers such as ICT staff education (e.g. number of educational days per person per year) do not communicate how the outcomes are to be achieved. And performance drivers without outcome measures may lead to significant investment without a measurement indicating whether the chosen strategy is effective. The proposed standard ICT BSC links with business through the business contribution perspective. The relationship between ICT and business can be more explicitly expressed through a cascade or waterfall of balanced scorecards. This cascade of scorecards becomes a linked set of measures that will be instrumental in aligning ICT and business strategy and will help to determine how business value is created through information technology. In the strategic area, although the measure is focused on the successful completion of strategic initiatives, it is recognized that the perception of ICT success or value added is highly dependent on the specifics of each initiative. It is now accepted that one must negotiate appropriate measures for each initiative with its corporate sponsor. For the business value of ICT projects, the measures flow from the

nature of the business case prepared for each project. Those focused on cost reduction use traditional financial measures such as ROI, those based on service improvements will be measured on attainment of higher service level targets, and those based on enabling the achievement of corporate strategy will be based on factors similar to strategic initiatives i.e. negotiated measures which demonstrate achievement of intended benefits.

ICT is a practice for controlling information technology system with its philosophies focused on the point of view of the customers. Years before, this was centered on their internal organization and the technology that they use. As things change, evolve and progress, providing focus on the customers became the priority. The discipline is not about the proper usage of a product or the technical specifications of the system; it is focused on the framework of the activities related to information technology and the relationship of the IT personnel with the users and customers. Thus, there is no other way to measure the efficiency of the management process than to use ICT service balanced scorecard.

In order to direct the use of the ICT service balanced scorecard in organization, there is a need to first align the organizational strategy with information technology. There are some things that should be avoid though when implementing the BSC. One is an ICT focused view of the performance of the ICT department. Also we should stay away from measures that hardly contribute to the success of the company, the deficiency in defining the standard metrics and being over-dependent on business tools.

The most important thing that should be rememberd when using the ICT service balanced scorecard is the integration of the business strategy with ICT management.

An advanced scorecard explicitly links itself to the strategy of information

technology. This means that it should be firmly paired with the strategic planning process so that it can aid in tracking the progress of the strategy against the objectives and goals. Executives should also be broadly committed to the full process. Both senior IT professionals and business managers should participate in the whole scorecard process including the design and the ongoing phases.

The metrics in the computer network support BSC should be relatable throughout the entire company. To achieve this, meetings and discussions should be held prior to the selection of the metrics. This will lead to consensus in metrics definitions.

Aside from the main four perspectives of the typical BSC, the ICT service balanced scorecard includes two more. Information security pertains to metrics that check the remediation efforts of the firm for the known and common vulnerabilities. The other is about metrics that measure the enterprise initiatives, which will then highlight the contributions of information technology in initiating strategic importance.

### **3. THE NEED FOR AN ALIGNMENT BETWEEN BUSINESS STRATEGY AND INFORMATION TECHNOLOGY STRATEGY**

Information systems have evolved from their traditional orientation of administrative support toward a more strategic role within organisations participating in the creation of competitive advantages for businesses. They range from automation to business process reengineering to the paradigm shift of creating completely new business models. Porter (1985) described the five overlapping stages in the evolution of technologies in business: automation of discrete transaction, functional

enhancement of activities, cross-activity integration, integration of the entire value-chain, and the optimisation of various activities in the value-chain in real time.

The organisation literature offers many perspectives to analysing the importance of strategic choices about the IT within organisations and their effects on performance, value-chain structure, innovation capability, and so on. Here it might be interesting adopting the strategic alignment framework that studies the relationship between business and IT strategies. If the methodology of the Balanced Scorecard has pointed out the necessity of an explicit strategy, understood by the entire organisation, then it should not be overwhelming recognising which critical role a strategic IT could play in the communicating and monitoring processes of a company.

The notion of strategic alignment originates from a body of conceptual and empirical work in the organisation's literature whose fundamental proposition is that organisational performance is the consequence of fit between two or more factors such as strategy, structure, technology, culture and environment. The contingency relationship that has received particular attention, has been the one between business strategy and technological deployment that supports the information processing requirements, due to the continuous strategic changes facing organisations. This approach is thus based on the assumption that organisations will be more effective and will perform better when their information-processing capacities (IT structure) fit their information-processing requirements (IT strategy). This concept of „alignment“ or „fit“ expresses an idea that the object of design, e.g. an organisation's structure or its information system, must match its context in order to be effective (Zviran, 1990). Parsons (1983) was one of the first to argue that ICT can affect a firm's ability to execute their business strategy. Since

then, many others have emphasised the need to develop a fit between ICT strategies and business strategies (Henderson and Venkatraman, 1989; Paulk et al., 1993; Chan et al., 1997). Strategic alignment is not an event but a process of continuous adaptation and change. A critical lever for attaining this dynamic capability is not a specific set of sophisticated technological functions, but the organisational capabilities to leverage technology to differentiate its operations from competitors. In other words, single ICT applications could not deliver a sustained competitive advantage. Rather, advantage is obtained through the capability of an organisation to exploit ICT functionality on a continuous basis. This requires a fundamental change in managerial thinking about the role of IT in organisational transformational, as well as an understanding of the critical components of IT strategy and its role in supporting and shaping business strategy decisions (Henderson and Venkatraman, 1989). Any strategy should address both external and internal domains. The former is the business arena in which the firm competes and is concerned with decisions such as product-market offering and the distinctive strategy attributes that differentiate the firm from its competitors. The latter is concerned with choices pertaining to the logic of the administrative structure ( functional or divisional or matrix organisation ), and the specific rationale for the design of critical business processes, as well as the acquisition and development of the human resource skills necessary for achieving the required organisational competencies.

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rationale for the design of critical business processes, as well as the acquisition and development of the human resource skills necessary for achieving the required organisational competencies.

These methods suggested the paradox that was mentioned above, and urged researchers to search for alternative ways of evaluating ICT related investments. Another approach to the problem is called "information economics" (IE) (Parker et al., 1988). This method allows to account for more intangible benefits like a better customer service or a higher degree of competitiveness. It also separates the benefits and risks into two domains (a business domain and a technological domain) and evaluates these domains jointly.

And now, the BSC found its way to evaluating ICT and its investments. Kaplan and Norton (1992, 1993 and 1996a,b) propose this method in order to evaluate a company's progress from four different perspectives. This model can also be applied to ICT investments and to the ICT function, as Gold (1992) and Willcocks (1995) have already indicated in a conceptual manner.

## 5. OUTSOURCING BSC IN ICT ORGANIZATION

In building a company-specific ICT balanced scorecard, the following steps are proposed:

1. presentation of the concept of the ICT balanced scorecard technique to top management and IT management;
2. data-gathering phase where information is collected on the following items : corporate and ICT strategy, (traditional) ICT metrics already in use for performance measurement;
3. developing the company-specific IT balanced scorecard inspired on

a "standardised" model as presented in this paper and based on the Kaplan and Norton (1996b) principles.

Following Kaplan and Norton (1996b) three principles have to be complied with in order to develop an ICT balanced scorecard that is more than a group of isolated and eventually conflicting strategies and measures:

1. build in cause-and-effect relationships
2. include sufficient performance drivers
3. linkage to financial measures.

Since the early 1990's, outsourcing has developed into a critical method for businesses to optimize the value of the information technology (IT) function. Gottshalk and Solli-Sæther (2005) describe IT outsourcing as, „the practice of turning over all or part of an organization's IT functions to an outside vendor". Businesses seek to outsource the IT function in an attempt to deliver increased cost-efficiencies that enhance the bottom-line without sacrificing IT capabilities. As Gottschalk and Solli-Sæther (2005,2006,2008) explain, „Client companies [that outsource IT] reported reduction of costs, better cost-performance, and economies of scale, compared to internal IT function". Weimar and Seuring (2009) identify an additional motivation for IT outsourcing, namely that it allows the business to, „focus on core business activities and development of competitive advantage". Koh, Ang, and Yeo (2007) found that markets evaluate a company's value more highly when the business outsources information technology functions. Outsourcing enables IT to deliver value to the business at lower costs and enables the business to focus on core-competencies; meanwhile, markets value companies that make the right strategic outsourcing decisions.

Since most organizations utilize service level agreements (SLA) to manage internal

IT functions, SLA's are a natural choice for managing external IT. However, Martorelli (2009) describes significant flaws associated with using service level agreements to manage outsourcers. Outsourcing agreements that utilize SLA's as the primary performance management tool often result in antagonistic business-vendor relationships. In addition, penalty clauses are difficult to enforce (Martorelli, 2009).

Businesses seeking to achieve a beneficial outsourcing arrangement with a vendor need an alternative means of managing the relationship. Gottshalk and Solli-Sæther (2005) identify eleven critical success factors for IT outsourcing, including, „vendor behavior control.” Gottshalk and Solli-Sæther (2005) describe “vendor behavior control” as including the use of “outcome-based and behavior-based incentives to reduce and prevent opportunistic vendor behavior.” By implementing outcome-based and behavior-based incentives, the business mitigates the risks associated with SLA-based management and encourages vendors to adapt behaviors that align with the company's vision and strategies.

As Weimer and Seuring (2009) state, „The balanced scorecard (Kaplan and Norton, 1992) plays a dominant role within current management accounting and controlling research and is considered as the preferred performance measurement system“.

Weimar and Seuring (2009) describe balanced scorecard's application as an outsourcing management tool. The balanced scorecard is defined as a controlling tool that is particularly suited to implement corporate strategies and to link operational and strategic governance (Kaplan and Norton, 2004) and can therefore be described as a strategic controlling tool. Consequently, the balanced scorecard can also be considered as a potential outsourcing controlling tool that supports the implementation of the

corporate outsourcing strategy and thereby governs and controls the external provider. It should be noted that „controlling” in the sense used by Weimar and Seuring (2009) is equivalent to „management accounting,” similar to the business role of a controller. Weimar and Seuring (2009) identify a relative gap in scholarly research related to outsourcing given the popularity of outsourcing as a business strategy (Weimar and Seuring, 2009). In a study of four case studies utilizing balanced scorecard to manage outsourcing agreements, Weimar and Seuring (2009) find, „the balanced scorecard characteristics represent under certain conditions an appropriate performance measurement system in the outsourcing context with the underlying compensation model being the major determinant for their applicability as it basically drives the characteristics of performance measurement systems in the outsourcing context”. Weimar and Seuring (2009) find that, where balanced scorecard is compatible with the financial aspects of a contract, it serves as a suitable means of managing the outsourcing contract.

The primary benefit of balanced scorecard when compared to service level agreements is that Kaplan and Norton's framework addresses the outsourcing from a strategic, holistic point-of-view. As Paranjape, Rossiter, and Pantano (2006) state, the traditional performance measurement systems based on financial metrics alone have been deemed inadequate and more attention is being paid to non-financial metrics. Several broader performance measurement systems have been designed, of which Balanced Scorecard (Kaplan and Norton, 1996a,b) has been the least criticized and most widely accepted. One benefit of the balanced scorecard is that it is a behavior-based measure. As a relationship, an outsourcing agreement will fluctuate over time. As Epstein and Rejc (2005) state, performance measurement systems have to

be modified as circumstances change, just like strategic objectives are modified according to the new strategy, drivers are revised, and new causal linkages among drivers are determined.

Effective management of the outsourcing contract requires a flexible system. Outcome-based controls like service level agreements have limited flexibility (e.g., there is little that can be varied in a measure like 99.9% network uptime). Behavior-based measures can incorporate outcome-based components, but focus on incentivizing desired behaviors.

Another benefit of using balanced scorecard to manage outsourcing arrangements is that Kaplan and Norton's framework enables a straightforward value chain analysis of the contract. In the 2005 article, „How to measure and improve the value of IT,” Epstein and Rejc (2005) propose a balanced scorecard framework tailored to IT. According to Epstein and Rejc (2005), the balanced scorecard provides a means for understanding and realizing hidden value from within the IT value chain. Following the logic laid out in Kaplan and Norton's (2004) article on valuing intangibles, Epstein and Rejc (2005) perform a value chain analysis on the IT function to demonstrate the business benefits of balanced scorecard performance management of IT (Epstein and Rejc, 2005; Kaplan and Norton, 2004). Epstein and Rejc's (2005) results for IT parallel Barber's findings for business use of balanced scorecard in determining value chains (Epstein and Rejc, 2005; Barber, 2008). Value chain analysis using balanced scorecard provides a richer, more meaningful view of the outsourcing relationship than a simple outcome-based measure like SLA's.

Sharma (2009), Buhovac and Slapnicar (2007), Assiri, Zairi, and Eid (2006) all identify balanced scorecard as useful, but very complex to implement effectively. Ittner (2008) and Buhovac and Slapnicar

(2007) are unable to distinguish a statistical difference between the results of balanced scorecard and other systems (intangibles valuation for Ittner, alternative performance measurement systems for Buhovac and Slapnicar), suggesting that more research is needed to understand balanced scorecard's relative popularity.

Businesses seeking to be competitive in the global marketplace must evaluate outsourcing as a strategic decision. Managing an outsourcing relationship is complex and requires the hybridization of multiple business strategies (at the very least, the primary business and its supplier) (Bravard and Morgan, 2009). Service level agreements have been found to be inadequate for managing IT outsourcing agreements (Martorelli, 2009).

## 6. WORLD EXAMPLES OF ICT BSC

Over the past decade, many CIO's have realized that it is not sufficient to manage merely the IT end of the business. The integration of IT strategy to business strategy must be managed as well. The tool chosen for this task is the balanced scorecard. The Working Council for Chief Information Officers (2003) did an extensive review of IT scorecards and found that the most advanced scorecards shared the following six structural attributes:

1. *Simplicity of presentation.*  
The very best scorecards are limited to a single page of from 10 to 20 metrics written in nontechnical language.
2. *Explicit links to IT strategy.*  
The scorecard should be tightly coupled to the IT strategic planning process and assist in tracking progress against IT's key goals and objectives.
3. *Broad executive commitment.*

Both senior IT as well as senior business managers should be involved in the scorecard process — both creation and ongoing.

4. *Enterprise-standard metrics definitions.*

Consensus should be quickly achieved on metrics definitions. The review meetings should focus on decisions rather than debate over metrics.

5. *Drill-down capability and available context.*

The high-level IT scorecard should allow for detailed review of trends or variance by providing more granularity on component elements.

6. *Individual manager compensation should be linked to scorecard performance.*

Bowne & Co. ([www.bowne.com](http://www.bowne.com)), a New York City-based documents management company, initiated an IT balanced scorecard in 1997. Their process consisted of seven steps:

1. *Kick-off training for IT staff*
2. *Ongoing strategy mapping.*

The annual IT strategy, like most companies, is derived from the corporate strategy.

3. *Metrics selection.*

A team, including the chief technology officer, created a list of metrics. The list was refined using analysis of each potential metric's strengths and weaknesses. The CIO approved the final list.

4. *Metrics definition.*

A set of standard definitions is created for each metric. It defines the measurement technique as well as the data collection process. It outlines initiatives that must be completed to allow tracking of the metrics.

5. *Assigning metric ownership.*

Owners are assigned to each

metric. This person is responsible for scorecard completion. Their bonuses are related to their scorecard-related duties.

6. *Data collection and quality assurance.*

Data frequency varies by metric, based on cost of collection, the corporate financial reporting cycle, and the volatility of the business climate.

7. *CIO, CTO, and corporate officers review scorecard every six months; metrics are revisited annually.*

Bowne & Co. is a good example of a departmentwide IT scorecard but this process can also be used to develop a scorecard for a particular system. The Central Intelligence Agency (Hagood and Friedman, 2002) did just this for a human resource information system (HRIS). The program director developed six criteria for success that would drive the balanced scorecard development effort :

1. *Deliver each new program segment on time and within budget*
2. *Deliver each functionality as promised*
3. *Maintain high system performance standards*
4. *Reduce reliance on legacy systems*
5. *Increase customer satisfaction*
6. *Employee satisfaction*

Martinsons, Davison, and Tse (1999) suggest that the four balanced scorecard perspectives might require some modification to be effective as an IT scorecard. Their reasoning is that the IT department is typically an internal rather than external service supplier, and projects are commonly carried out for the benefit of both the end users and the organization as a whole — rather than individual customers within a large market.

Martinsons et al. (1999) also explain that the three key balanced scorecard principles

of :

1. *Cause-and-effect relationships*
2. *Sufficient performance drivers*
3. *Linkage to financial measures*

are built into their IT scorecard. They explain that cause-and-effect relationships can involve one or more of the four perspectives. For example, better staff skills (future readiness perspective) will reduce the frequency of bugs in an application (internal operations perspective).

Like Brewton (2003), Rosemann and Wiese (1999) demonstrate that the balanced scorecard can be used at the system level. Enterprise resource planning (ERP) is one of the most sophisticated and complex of all software systems. It is a customizable software package that includes integrated business solutions for core business processes such as production planning and control and warehouse management. The major ERP vendors ( SAP, Baan, Oracle, and PeopleSoft ) have seen their profitability soar in recent years. Rosemann and Wiese (1999) use a modified balanced scorecard approach to :

1. *Evaluate the implementation of ERP software*
2. *Evaluate the continuous operation of the ERP installation*

## 7. ICT ENGINEERING TODAY

The field of engineering involving computer-based hardware and software systems, and communication systems, to enable the acquisition, representation, storage, transmission, and use of information. Successful implementation of information technology is dependent upon being able to cope with the overall architecture of systems, their interfaces with humans and organizations, and their relationships with external environments. It is also critically dependent on the ability to successfully convert information into knowledge.

Information technology is concerned with improvements in a variety of human and organizational problem-solving endeavors through the design, development, and use of technologically based systems and processes that enhance the efficiency and effectiveness of information in a variety of strategic, tactical, and operational situations. Ideally, this is accomplished through critical attention to the information needs of humans in problem-solving tasks and in the provision of technological aids, including electronic communication and computer-based systems of hardware and software and associated processes. Information technology complements and enhances traditional engineering through emphasis on the information basis for engineering.

The knowledge and skills required in information technology come from the applied engineering sciences, especially information, computer, and systems engineering sciences, and from professional practice. Professional activities in information technology and in the acquisition of information technology systems range from requirements definition or specification, to conceptual and functional design and development of communication and computer-based systems for information support. They are concerned with such topics as architectural definition and evaluation. These activities include integration of new systems into functionally operational existing systems and maintenance of the result as user needs change over time. This human interaction with systems and processes, and the associated information processing activities, may take several diverse forms. The hardware and software of computing and communications form the basic tools for information technology. These are implemented as information technology systems through use of systems engineering processes. While information technology and information systems

engineering does indeed enable better designs of systems and existing organizations, it also enables the design of fundamentally new organizations and systems such as virtual corporations. Efforts in this area include not only interactivity in working with clients to satisfy present needs but also awareness of future technological, organizational, and human concerns so as to support transition over time to new information technology-based services.

This set of workforce solutions is based on the information technology industry's priorities that address issues such as:

- Over 90% of IT workers are performing jobs outside the IT industry, therefore it is necessary to have both IT training and complementary training in a respective business sector such as health care, manufacturing, and financial services.
- Government may serve as an honest broker for specific issues such as promotion and image, forecasting the future of the workforce and their training needs.
- Educators should expose kids to the new dynamic, global workplace and teach more about today's business culture.
- Incumbent worker training has helped retain workers.
- When recruiting for high-end jobs, the industry sees a need to develop soft skills.
- The grants are intended to provide genuine solutions, leadership, and models for partnerships that can be replicated.

In the modern workplace, it is imperative that information technology works both effectively and reliably. Computer and information systems managers play a vital role in the implementation and administration of

technology within their organizations. They plan, coordinate, and direct research on the computer-related activities of firms. In consultation with other managers, they help determine the goals of an organization and then implement technology to meet those goals. They oversee all technical aspect of an organization, such as software development, network security, and Internet operations. They plan and coordinate activities such as installing and upgrading hardware and software, programming and systems design, the implementation of computer networks, and the development of Internet and intranet sites. They are increasingly involved with the upkeep, maintenance, and security of networks. They analyze the computer and information needs of their organizations from an operational and strategic perspective and determine immediate and long-range personnel and equipment requirements. They assign and review the work of their subordinates and stay abreast of the latest technology to ensure that the organization remains competitive.

Computer and information systems managers can have additional duties, depending on their role within an organization. Chief technology officers (CTO's) evaluate the newest and most innovative technologies and determine how these can help their organizations. They develop technical standards, deploy technology, and supervise workers who deal with the daily information technology issues of the firm.

When a useful new tool has been identified, the CTO determines one or more possible implementation strategies, including cost-benefit and return on investment analyses, and presents those strategies to top management, such as the chief information officer (CIO).

Management information systems (MIS) directors or information technology directors manage computing resources for their organizations. They often work under the chief information officer and plan and

direct the work of subordinate information technology employees. These managers ensure the availability, continuity, and security of data and information technology services in their organizations. In this capacity, they oversee a variety of technical departments, develop and monitor performance standards, and implement new projects.

IT project managers develop requirements, budgets, and schedules for their firm's information technology projects. They coordinate such projects from development through implementation, working with their organization's IT workers, as well as clients, vendors, and consultants. These managers are increasingly involved in projects that upgrade the information security of an organization.

In recent years, information technology management has been growing in popularity amongst both big and small businesses, partnerships, proprietorships, and especially huge corporations. Information technology has expanded to the point where it can be considered its own field of interest and a career occupation or even its own industry, and technology management is a huge aspect of any business in this day and age. Virtually anything and everything is done with some form of technology, and information technology management can prove to be quite useful and profitable to companies if used accurately and practically. The most basic fundamental principle of information technology management is the investigation and comprehension of how information technology will help any given business, large or small, expand and prosper. Information technology, in short, is the utilization of all kinds of technology to gather and store information and data of any given business. Technology management is a crucial component to companies looking to expand, for the information that is arranged and organized

by information technology management can provide useful data for future decisions that can be either extremely beneficial to a company or just as detrimental.

Information technology management is not to be confused with another field of occupational career, management information systems. To the average consumer with little to no knowledge of technology management these two terms may seem equivalent however, the two industries contrast in a very distinct way while sharing a few similarities. Both information technology management and management information systems are related in the sense that both of these fields utilize technology management and the use of various technologies in order to benefit a company. The main difference however, is what the technology is used for and how. Information technology management assists a business in organizing and ensuring that any and all information pertaining to a certain department or component of a company is accurate and readily available at all times. The main purpose of management information systems is to utilize and process this information stored by information technology management in order to assist in making decisions for the better of the company. Both information technology management and management information systems are essential aspects of any business that is looking to flourish and expand their horizons. Smart and profitable choices by a company start with an effective and efficient technology management department. Information technology management is a continually growing field, and as technology advances further and businesses become larger, information technology management is a sure career occupation that holds a bright and promising future.

Without the assistance of proper technology management and accurate information processing, business owners would be at a much greater risk of making

bad decisions and giving up profits. Those companies without an effective information technology management department are at a severe disadvantage compared to their competitors. Information technology management not only keeps confidential and imperative information and data stored in an organized fashion, it provides a healthy supplement to the closely related management information systems field which is just as important as information technology management in a company looking for prospective growth.

## 8. CASE STUDY

Case study is based on research within the IT area – on BSC impact and its application to IT organizations. A case study research approach is used to study the phenomenon of the IT BSC and its development and implementation in a organizations. The aim of this paper is to analysis indicators of business processes in organizations and implementation of IT BSC softwares so that they can serve as a possible direction for improving the effectiveness of the process.

Three IT organizations and their characteristic processes are presented in this paper.

**Win-Win** is a small IT organization with a branch located in Vrnjacka Banja who offers a wide selection of top-quality original computers, softwares and programs. Win-Win is specialized in helping both start-ups and established companies to harness their ideas and bring their products to market successfully and even faster. Win-Win can provide the most value to customers by acquiring expertise in best-of-breed technologies that help solve difficult business and IT problems.

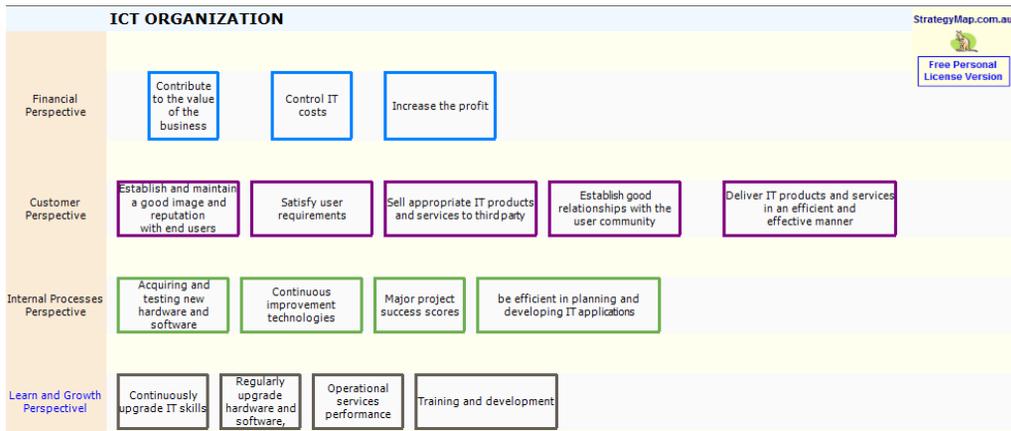
**PC Centar** is a medium software

outsourcing company in Belgrade ( Zemun ). They are client-centered organization and their highly skilled development team provides tailored solutions that best fit business and technology needs. PC Centar with high level service at competitive international rates provides customers high quality services at more competitive price. PC Centar can combine engineering team with architects and developers, and through a carefully developed and thorough process ensure that the best of design and precise engineering is applied.

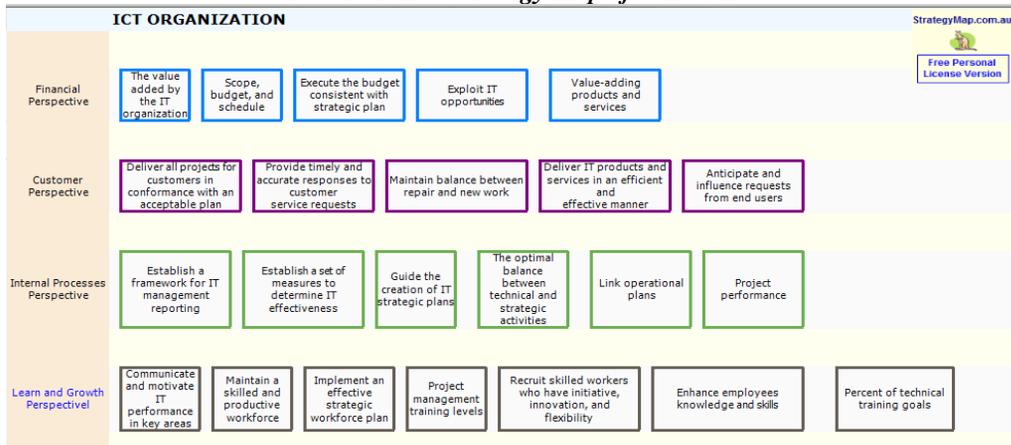
**Solutions for Human Capital (S4HC)** is a large enterprise in Belgrade which is supplying the clients with human capital, IT consulting, and project management, with professionals that have application specific knowledge and experience in programming, software development, and by using innovative, value-creating technologies and solutions. Solutions for Human Capital provides the expert technical knowledge and a flexibility approaches that positively impact cost, cycle time and project success while becoming an integral part of success. Solutions for Human Capital can provide clients with IT solutions that overcome continuously increasing business challenges.

These organizations are typically engaged by software development companies to provide expertise in specialized technology areas, also they have consultants and architects who work closely with the customer to identify requirements and then they take over the responsibility to architect, implement and test the solution, as well as to support it after deployment.

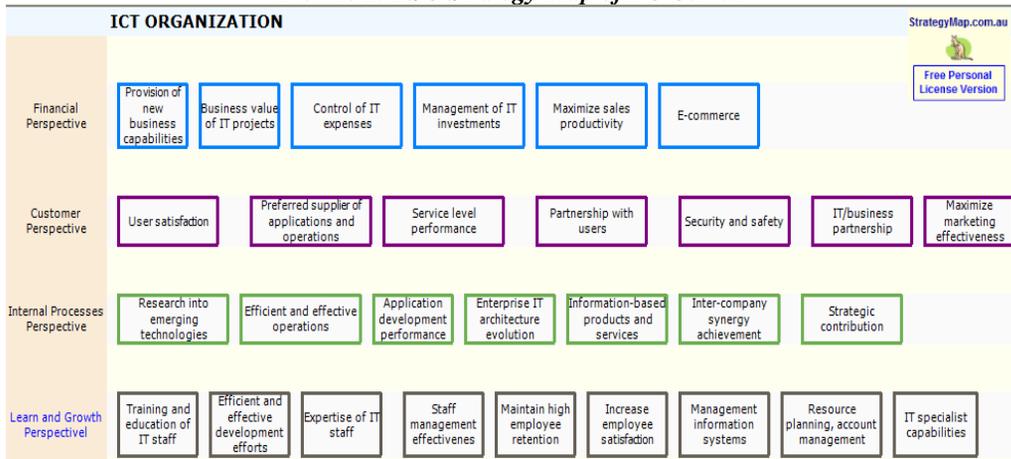
BSC Strategy maps of these organizations are shown on pictures 1., 2 and 3.



Picture 1. BSC Strategy Map of Win-Win



Picture 2. BSC Strategy Map of PC Centar



Picture 3. BSC Strategy Map of Solutions for Human Capital (S4HC)

These pictures of BSC Strategy maps show that if the result of strategic thinking

is an effective strategic plan, from which we obtain an effective operational plans,

then our business plans, which are the result of the latter, and the results arising from the business plans are outputs of the highest possible performance. Also, measuring the impact of performance shows that whether cause/the resulting model meets or does not meet the rejection of the results we anticipated and performance measurement of results are demonstrated to us after a specified time.

IT BSC performance ensures effective communication and translation of business needs into IT processes and educates users on the IT corporate agendas. Management of these three organizations is divided so that management services focuses on running IT as a business and ensures effective financial management and management reporting including IT scorecard reporting and employs IT generalists who provide IT insights into business strategy and decision making. A cascade of balanced scorecards has been established to create a link between the scorecards at the unit level and the overall business objectives. The measures of these unit scorecards are rolled-up or aggregated in the IT strategic balanced scorecard. This, in turn is fed into and evaluated against the business objectives. In this way, the service ( and value ) delivered by IT is directly measured against the objectives of the overall business. Further, the IT strategic BSC is reviewed by business and IT management and the result is fed back into the next annual planning cycle. This planning cycle defines what the business needs are and what IT must do to accomplish those needs. For example, from the IT service desk scorecard (i.e. a unit scorecard, which is situated in the operational services scorecard group), metrics such as average speed of answer, overall resolution rate at initial call and call abandonment rate (all three customer orientation metrics) are rolled-up to service level performance metrics in the IT strategic balanced scorecard. Other metrics of this unit scorecard, such as

expense management (corporate contribution perspective), client satisfaction (customer orientation perspective), process maturity of incident management (operational excellence perspective) and staff turnover (future orientation perspective), will aggregate as part of the IT strategic scorecard. The overall view of the IT strategic balanced scorecard is then fed into and evaluated against the defined business objectives. These connections help to understand how the contribution of IT towards the business will be realized : building the foundation for delivery and continuous learning & growth ( future orientation perspective ) is an enabler for carrying out the roles of the IT division's mission ( operational excellence perspective) that is in turn an enabler for measuring up to business expectations ( customer perspective ). Establishing the link with the business objectives through a cascade of scorecards and defining the cause-and-effect relationships within the scorecards are important steps in determining the maturity of the IT balanced scorecard. It is understood that major milestones in this further development will be :

- the detailed cause-and-effect relationships between the output measures and performance
- drivers have to be further elaborated,
- short and long term targets have to be further defined,
- individual and group objectives of IT employees have to be further linked to the IT BSC,
- the scorecards have to be further integrated in the strategic and operational management processes.

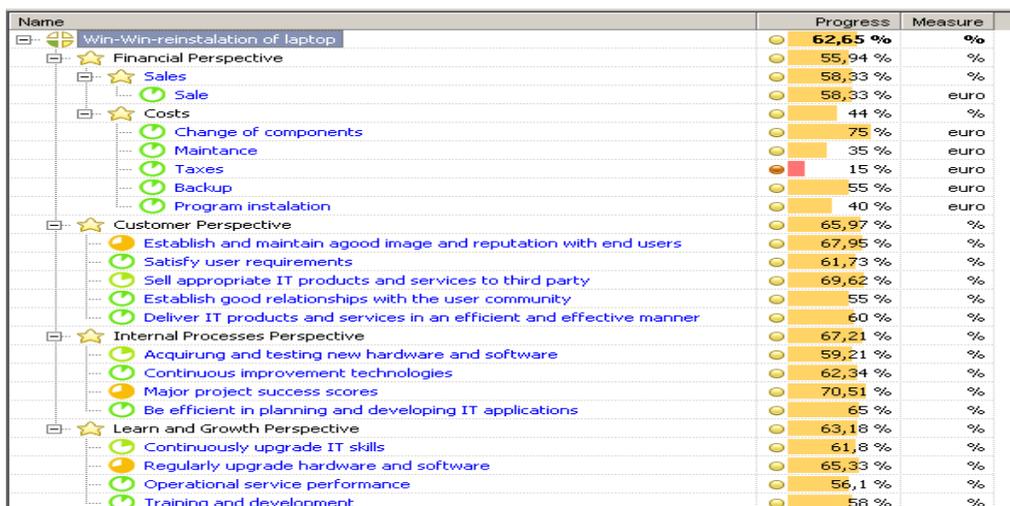
ICT BSC activities costs are in a more detailed level. These three organizations approval processes of both the overall enterprise architecture and the systems level architectures delivered through major projects. The enterprise architecture

dictates certain architectural and technical standards for application and technical systems and is reviewed and re-approved on a regular basis. The goal is to develop an overall risk management strategy and measure attainment of the defined target state risk level. Next, a regular survey process using generic questions needs to be developed to measure customer

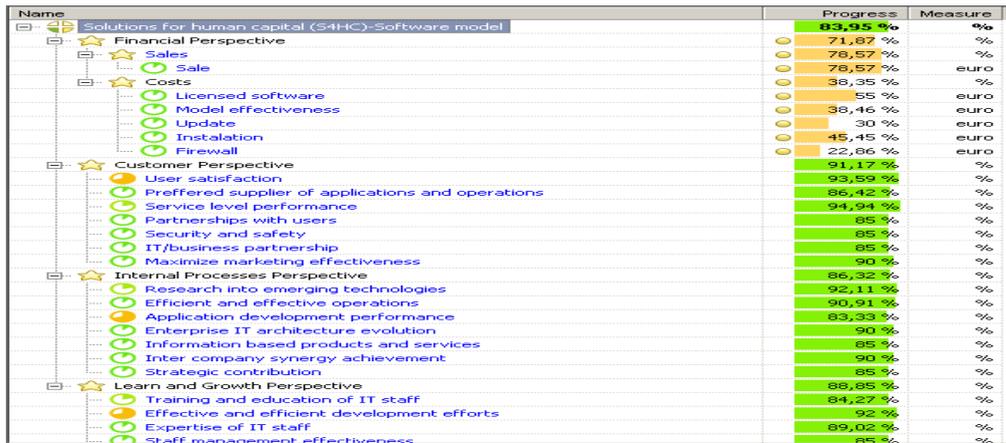
satisfaction and a process for assessing the „state of the infrastructure“. Each of these organizations have a characteristic process and its costs of that process so operational services baselines and targets and unit scorecards of these organizations are developed and a measurement process for personal development are implemented – this is shown on pictures 4., 5 and 6.



Picture 4. BSC scorecard of Win-Win process (reinstallation of laptop)



Picture 5. BSC scorecard of PC Centar process (installation of windows programs)



Picture 6. BSC scorecard of Solutions for human capital process (software model)

The case study illustrated one of the most crucial issues in building and implementing an ICT strategic Balanced Scorecard : its required linkage with the business objectives. To create this link a cascade of balanced scorecards has been established with at the lower level unit scorecards for the operational and development services. The measures of these unit scorecards are rolled-up or aggregated in the IT strategic scorecard that ultimately realizes the link with the business objectives through its corporate contribution perspective. The precise articulation of the cause-and-effect relationships through the identification of outcome measures and their corresponding performance drivers, seemed to be a critical success factor.

There should be scheduled activities that provide for sufficient levels of operational awareness, a sampling of which follows:

- ✓ Hold periodic meetings between management staff with agenda items designed to fully communicate subjects such as current initiatives, status of problem areas and actions taken to date, scheduled and planned training, and policy and procedure revision status of organizational or contract change implementation, as appropriate.

- ✓ Review status reports and trend analyses of performance measures. Perform limited on-site review ( if applicable ) of selected areas of significant risk as appropriate.
- ✓ Maintain awareness and involvement at a level such that a „for cause“ issue is not a surprise. When a „for cause“ condition exists, certain surveillance activities may be assigned to other disciplines or functional areas. In these instances, supporting documentation resulting from the findings should be provided to the organization. Reports generated as a result of internal audits should be considered valuable diagnostic tools.

Selected significant risk areas typically refer to those actions or activities that require compliance with laws, regulations, and contract terms and conditions. There should be various control systems employed as necessary to ensure compliance and to test the currency and adequacy of the business system. The following suggestions can assist in the validation and verification of the self-assessment process and results :

- ✓ Mutually understand what and how the organization will measure performance.

- ✓ Become familiar with the data sources and methods that will be used in the calculations.
- ✓ Confirm that the collection methodology is accurate, complete, and timely.
- ✓ Confirm that the data is properly controlled.
- ✓ Become familiar with the trend analysis techniques to be used and gain assurances that the organization's personnel are qualified in this area.

## 9. CONCLUSION

It is understood that major milestones in further development will be : output measures and performance drives have to be systematically identified, the cause-and-effect relationships between these two measures have to be established, the ICT scorecard has to be linked with the business scorecard and the ICT/business alignment process, short and long term targets have to be defined, individual and group objectives of IT employees have to be linked to the ICT BSC, the scorecards have to be integrated in the strategic and operational management processes.

It is based on framework for the IT function for the balanced score card technique, completed with elements of information economics and business reengineering. This framework is a strategic management tool that enables management to follow up the measures and to drive performance based on the goals that were set and agreed upon in advance.

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For a world-class performance it is important that the global processes, virtual teams and individuals within the teams in these multinationals, work in a smooth and integrated manner. Performance can be greatly enhanced if there is timely ( often real-time ) reporting, instant feedback, quick decisions and immediate actions. While balanced scorecard stands out as the most popular and least criticized means of managing strategic performance of outsourcing agreements, additional research is needed.

Balanced scorecard provides an alternate, behavior-based means of managing outsourcing agreements that provides improved alignment between business and supplier strategies and overall greater satisfaction. The four perspectives of balanced scorecard enable a holistic view of the business relationship with the outsourcing vendor that is not provided by outcome-based measures. Businesses engaging an outsourcer should consider utilizing balanced scorecard to manage the performance of the supplier. Organizations today use decentralized business units that focus on intangible knowledge, capabilities, and relationships created by employees. Some organizations understand that strategy must become a continual and participative process. The change from centralized command, and financial measures that come from past actions can no longer measure the objectives that need to be addressed. We must measure the strategy and the best tool to do this is balanced scorecard.

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