

## BALANCED SCORECARD IMPLEMENTATION IN CONSTRUCTION INDUSTRY

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UDK: 005.6/.8

DOI: 10.14415/konferencijaGFS2021.56

*Summary: This paper presents Balanced Scorecard (BSC) as a strategy-based measurement system that could solve defining and implementing strategy. Construction companies often have a centralized organizational structure, an undetermined vision, and an emphasis on maximizing revenue. Focusing on achieving and maintaining short-term financial success can cause construction companies to underinvest in long-term value creation, specifically in the intellectual and intangible assets that provide future growth.*

**Keywords:** *Balanced Scorecard, strategy, measurement system*

### 1. INTRODUCTION

This paper presents Balanced Scorecard (BSC) as a strategy-based measurement system that could solve defining and implementing strategy in construction companies. Construction companies often have a centralized organizational structure, an undetermined vision, and an emphasis on maximizing revenue and minimizing operating cost. Usually, the CEO and executive team fail to translate their vision and strategy to middle managers and front-line employees, and incentive compensation is linked to achieving short-term and tactical goals achieving instead of long-term strategic objectives. Most management systems in the construction industry use feedback only about short-term operational performance. The bulk of this feedback is on financial measures, usually comparing actual results to monthly and quarterly budgets. Little or no time is spent examining key performance indicators of strategy implementation and success. This leads to a significant turnover of employees, creating a bad image and destroying the company's value.

The short-term backwards-looking, transaction-based orientation of accounting measures can be balanced by focusing on other performance measures that are more future-oriented. Accomplishments in areas such as R&D, new product development, product quality, and

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customer satisfaction are often value drivers and leading indicators of future financial performance. Thus, supplementing the financial measures with some combination of these value drivers can be used to mitigate a manager's tendencies to prop up short-term financial measures at the expense of future performance. Because carefully selected value drivers are leading indicators of future cash flows and profits, value drivers focus managers' attention on actions and decisions they should worry about today to create value in the future [1]

### 2. BALANCED SCORECARD

The concept of the balanced scorecard was developed in 1992. by Robert S. Kaplan and David P. Norton and revolutionized conventional thinking about performance metrics. By going beyond traditional financial performance measures, this concept has helped to create a generation of managers who are able to better understand how their companies are really doing. These nonfinancial metrics are so valuable mainly because they predict future financial performance rather than simply report what's already happened. Furthermore, the book [2] written in 1996, describes how the balanced scorecard can help senior managers systematically link current actions with future's goals.

The Balanced Scorecard emphasizes that financial and nonfinancial measures must be a part of the information system for employees at all organizational levels. Front-line employees must understand the financial consequences of their decisions and actions; senior executives must understand long-term financial success drivers. The Balanced Scorecard should translate a mission and strategy into tangible objectives and measures.

The Balanced Scorecard is more than a tactical or an operational measurement system. Innovative companies use the scorecard as a strategic management system to manage their strategy over their long run. They are using the measurement focus of the scorecard to accomplish critical management processes:

- Clarify and translate vision and strategy
- Communicate and link strategic objectives and measures
- Plan, set targets, and align strategic initiatives
- Enhance strategic feedback and learning [2]

### 3. PERSPECTIVES

When speaking about Balanced Scorecard, there are four major branches and perspectives to focus on when creating a new one and implementing it in company system:

**FINANCIAL PERSPECTIVE** - Financial objectives represent the organization's long-term goal: to provide superior returns based on the capital invested in the unit. Using the Balanced Scorecard does not conflict with this vital goal. Indeed, the Balanced Scorecard can make the financial objectives explicit and customize financial objectives to business units in various stages of their growth and life cycle. The drivers in the financial perspective will be customized to the industry, the competitive environment, and the business unit's strategy. In the construction industry, the main objectives are profitability, Revenue growth and Cost reduction productivity.

**CUSTOMER PERSPECTIVE** - After formulating the customer perspective, managers should have a clear idea of their targeted customer and business segments and selected a set of core outcome measurements - share, retention, acquisition, satisfaction, and profitability – for these targeted segments. These outcome measures represent companies' marketing, operational, logistics, and product and service development processes. When talking about customer perspective in the construction branch, we are talking about Investors. Every construction company that cares about customers need to fulfil certain classes - quality of executed works, the time required to complete works and price.

**INTERNAL BUSINESS PROCESS PERSPECTIVE** - In the internal-business-process perspective, managers identify the critical processes at which they must excel if they are to meet the objectives of shareholders and targeted customer segments. Conventional performance measurement systems focus only on monitoring and improving cost, quality, and time-based measures of existing business processes. In contrast, the Balanced Scorecard approach enables the demands for internal process performance to be derived from the expectations of specific external constituencies.

**LEARNING AND GROWTH PERSPECTIVE** - Ultimately, the ability to meet ambitious targets for financial, customer, and internal-business-process objectives depends on the organizational capabilities for learning and growth. The enablers for learning and growth come primarily from three sources: employees, systems, and organizational alignment. Strategies for superior performance will generally require significant investments in people, systems, and processes that build organizational capabilities. A core group of three employee-based measures—satisfaction, productivity, and retention—provide outcome measures from investments in employees, systems, and organizational alignment.

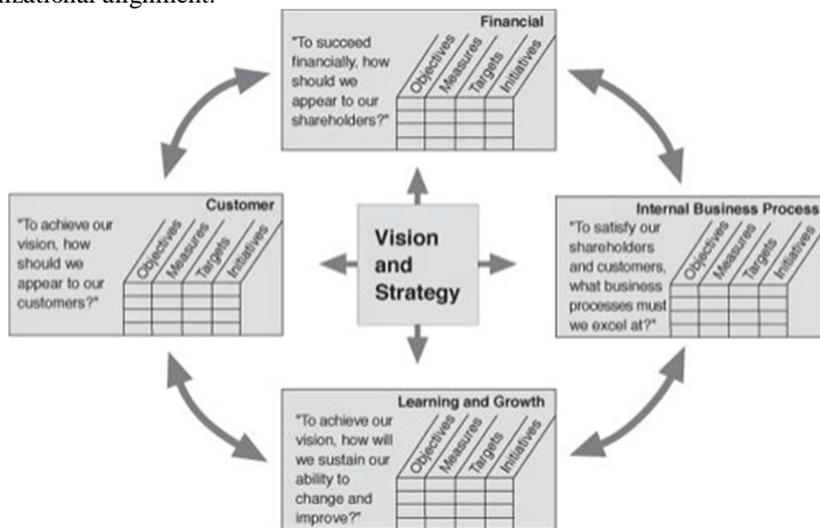


Figure 1. The Balanced Scorecard Provides a Framework to Translate a Strategy into Operational Terms

#### 4. BALANCED SCORECARD IN COMPANIES

In terms of long-lasting company success, strategic planning is one of the most vital aspects. The BSC helps companies to understand better and achieve organizational objectives. In the survey taken in 2017, organizations that are participated stated that:

- 77% report that BSC is extremely or very useful
- 75% use BSC to influence business actions
- BSC is used by both small and large companies: 61% had less than 500 employees, and 9% had over 10.000 employees. [3]

The survey results also show that most of the companies that started using BSC have more positive results consistently than before using it:

**VOLKSWAGEN** - After eight years of consecutive financial losses and market share declining, VW Brazil Team developed and deployed a BSC strategy map. The team used a strategy map to align financial and project resources to the strategy and simultaneously motivate more than 20.000 employees with constant education strategy and installing rewards and recognition programs. After using the BSC program, VW Brazil Team noticed that market share started increasing and negative financial results converted into positive. [4]

**FORD MOTOR COMPANY** - In Germany's Ford automotive plant, during a regular metric review in fall 2009, officials discovered an increased basecoat paint consumption. In the long term, that leads to higher production costs and a higher level of volatile organic compound (VOC) emissions. A quick review run by company officials shows that paint consumption was 4.18kg/unit instead of calculated and planned consumption of 3.74kg/unit. In financial terms, the Ford Motor Company was losing around 1.5 million USD annually and had a higher environmental impact. They developed a plan for how to measure and define their targets. The plan consisted of daily measurement of paint film thickness and consumption per robot, and manual painter. The result shows that problem is in robots damaged solvent recovery valve. After fixing the problem, officials run another review and figures out that the results are far above defined targets. They managed to save around 2 million USD annually and have a much lower environmental impact with lower VOC emissions. [5]

**PHILIPS ELECTRONICS** - BSC program in Philips company aligns company views to focus employees on how they fit into the big picture, strategic policies, vision for the future, and educating what drives the business. Philips management uses BSC to create regular reviews worldwide to promote organizational learning and continuous examples. They also believe that understanding what drives present performance is the basis to determinate future results, a way of thinking that BSC provides. [6]

**MICROSOFT LATIN AMERICA** - Microsoft branch in Latin America introduced a BSC program to help managers to formulate and control strategy. Their priorities are rolling out a new corporate database software package and determinating a strategy to combat software piracy. [7]

## 5. BALANCED SCORECARD FOR CONSTRUCTION COMPANIES

The Balanced Scorecard strategy map (Figure 2) provides a framework that illustrates how the strategy links intangible assets to long-term value creation in competing construction companies.

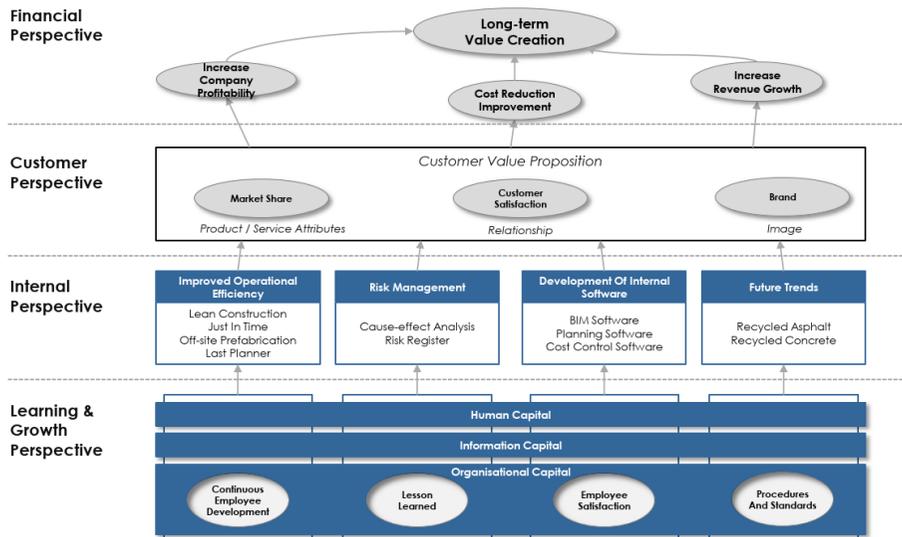


Figure 2. Balanced Scorecard strategy map for construction company.

We defined key performance indicators for a competitive construction company:

**EBIT MARGIN** is the operating earnings over operating sales. This margin allows investors to understand the true business costs of running a company. Based on the figures obtained in Deloitte's DeGlobal Powers of Construction 2019 (GPoC) report, average EBIT margin for Top 30 worlds construction companies from construction activities in 2019. is 5,5%. [8]

**RETURN ON EQUITY ROE** is one of the two basic factors in determining a firm's growth rate of earnings. Sometimes it is reasonable to assume that future ROE will approximate its past value, but a high ROE in the past does not necessarily imply a firm's future ROE will be high. A declining ROE, on the other hand, is evidence that the firm's new investments have offered a lower ROE than its past investments. [9] According to Deloitte's Global Powers of Construction 2019 (GPoC) report, average ROE for Top 30 worlds construction companies from construction activities in 2019. is 12,2%.

**REVENUE GROWTH** - Increasing a share of targeted market segments is a frequently used metric. It also enables us to assess whether its market share growth is from improved competitive offerings or just growth in the market's total size. Gaining sales but losing share may indicate problems with strategy or the attractiveness of its products and services.

**COST REDUCTION** is applied to all processes that do construction projects as cost-effectively as possible while maintaining the same if not improved levels of quality, schedule, and safety control. The use of techniques such as Just-in-time (JIT) production, Activity-based cost management, value engineering and Supply chain material management will improve cost efficiency and reduce direct and indirect costs.

**ECONOMIC VALUE ADDED EVA** is a firm's true economic profit after deducting the full opportunity cost of all invested capital for both equity and debt. It converts balance sheet assets into a charge to profit, just like the cost of goods sold. Accordingly, EVA increases when managers streamline operations and cut wasteful costs, invest capital in growth above the cost of any added capital, turn over assets faster, and release capital from uneconomic assets and activities. In short, EVA illuminates all the ways that performance can be improved, and wealth created in any business. [10]

**MARKET SHARE** - Structured and enhanced long-term collaboration with clients, as well as suppliers and subcontractors, will contribute to greater market share.

**CUSTOMER SATISFACTION** - Interview with Client, suppliers, subcontractors and Customer satisfaction index have the purpose of measuring their level of satisfaction. ARUP's Client Relationship management is a good pattern for the strategic development of the relationship with the Client. Clients database and their feedback is the foundation for creating customer value.

**BRANDING AND IMAGE** will be built through the creation of a partnering model that benefits all project participants.

**DEVELOPMENT OF INTERNAL SOFTWARE** - When a company wants to keep up with their expenses, their organization and avoid unnecessary costs, managers need to develop an internal software for that use or use existing software already on the market with a small modification to adapt for their use.

Here is a list of internal software that STRABAG is currently using:

- **iTWO** – Software for creating a bidding price, calculating direct job costs, keeping up with expenses and to preview project financial status at the moment and to predict financial status when the project is completed, and much more
- **STRAtakt Asphalt** – Software for asphalt calculating. Asphalt is one of the most expensive material in the construction process. It needs to plan and organize carefully, including the quantity of asphalt that is needed to make, time for transportation of asphalt mass to the construction site and time needed for asphalt paving. STRAtakt provides a view of when trucks leave the asphalt plant, where the truck is currently via GPS, and when they will arrive at the site in real-time. After paving is completed, the software provides a full review of how much asphalt mass is used, at what time and where is financial loss. When a truck is waiting for discharge, a mass in paver due to poor site organization, too many trucks arrived at the same moment on site.
- **STRAtakt Frasen** – Software for asphalt milling. Same as the software for asphalt paving but with adaption for asphalt milling. It enables calculating the quantity of milled asphalt, the number of trucks needed for the job, transportation to the dumping site, etc.

**RISK MANAGEMENT** - Construction is a risky business for a variety of reasons and is proven out by the high number of construction firm failures each year. To minimize the potential for financial difficulty, a contractor should analyze each potential project to determine the risks involved and whether or not the potential rewards justify acceptance of the risk exposure. Risk management is part of any financial study and involves risk identification, measurement, and mitigation strategies. [10] For easier risk overview and analyzing, it is recommended to create and use a risk register where managers put all risks that they come up to at starting of the project. The register is a highly effective tool for planning and overviewing the entire project and its risks.

**FUTURE TRENDS** - If a company wants to stay in the business market for a long time and wants to place high in it, it must monitor future trends and develop and adapt the company in that direction. As the development and standard of the human mankind increases rapidly, and as technology evolves unstopably, there is a need for greater construction to meet those needs. Large-scale construction is a consequence of a high risk of environmental catastrophe, so it is important to shift the focus to finding more optimal construction solutions. Some of these solutions would be the construction of green buildings and environmentally friendly factories. Also, the harmful impact of bitumen in asphalt in terms of ecology is generally known. One solution would be recycled asphalt, where the reduction of the impact would be reflected through less use of new bitumen and more recycled.

**IMPROVED OPERATIONAL EFFICIENCY** - To reduce unnecessary expenses on the job site, managers need to find a proper way to cut costs. There is a high demand for operational optimization in the last two decades, and the solution for that demand is lean construction techniques. Lean construction techniques are a collection of processes intended to eliminate construction waste and meet or exceed the project owner's expectations. The application of lean principles results in better utilization of resources, especially labor and materials. The strategy for lean supply is to provide materials when needed to reduce variation, eliminate waste, improve workflow, and increase coordination among construction trades. Some of the lean construction techniques for material optimization is a strategy named "just in time deliveries". The goal is that materials that will be needed within 36 hours of installation are on site, but not too early or too late. Also, to reduce costs of material, managers should focus on off-site prefabrication. In terms of planning and organization on-site, the lean construction technique is called "the last planner ". The last planner is an individual or group of individuals responsible for accomplishing the work on time and in budget with a minimum of financial costs. [11]

**CONTINUOUS EMPLOYEE DEVELOPMENT, EMPLOYEE SATISFACTION AND LESSON LEARNED** - Interview with employee and Employee Satisfaction Index have the purpose of measuring company members' level of satisfaction and engagement in their current working environment and working practices and seek their feedback about future direction and capability for reaching long term goals, and whether we are creating the right environment for employees and firm to thrive in the future. Knowledge sharing is a synergistic process that enhances personal learning by developing the skill to identify more effective ways of solving problems and integrating this experience into value creation. A good example would be ARUP with Yearly appraisal, 'Working at Arup' -

global membership engagement survey and Arup University, a place that brings together all the firm's learning opportunities, enables collaboration and knowledge sharing through company's skills networks and provides information resources for all members. Opportunities are open to all Arup members to support their personal development, thirst for knowledge and passion for developing ever-better solutions include access to research funding and collaboration opportunities with leading academics and professionals, masters modules delivered in partnership with the world's leading universities, and in-house learning. The internal certification system is a great pattern for how a company can invest and create the ideal employee according to the company's needs and personal, professional aspirations. 70:20:10 concept is a way of explaining how learning occurs at work. It represents a ratio of learning from experience (70%), learning from others (20%) and learning in a formal setting (10%). [13],[14].

### PROCEDURES, STANDARDS AND ORGANIZATIONAL STRUCTURE -

Defining the company's procedures and standards is one of the strategic priorities. That is the basic support in risk management and thus reduce flops by contributing to the continuous improvement of business processes. One important determining factor is the inter-organisational consistent cooperation of all project participants. STRABAG's "Common Project Standards" (CPS) is a good example of defining Group-wide minimum standards applicable to the initiation and execution of construction projects within the STRABAG SE Group. CPS combines systematic and consistent risk management, process implementation responsibility, core application and process measurement.

	STRATEGIC OBJECTIVES	KEY PERFORMANCE INDICATORS	TARGETS	INITIATIVES
FINANCIAL	Increase company profitability	EBIT margin	6%	<ul style="list-style-type: none"> <li>• Taking existing products and services to new customers and markets.</li> <li>• Incorporate activity-based costing, value engineering and Economic Value Added.</li> </ul>
		Return on equity ROE	20%	
	Increase Revenue growth	Market Revenue growth	5%	
	Cost reduction improvement	Cost Reduction	3%	
	Value Creation	EVA	> 0	
CUSTOMER	Market share	Market share growth	5%	<ul style="list-style-type: none"> <li>• Structured and enhanced long term collaboration with clients, as well as suppliers and subcontractors</li> <li>• Client Relationship management.</li> </ul>
	Customer Satisfaction	Interview with Client suppliers, subcontractors Customer satisfaction index	1 per Q > 70% for all employees	
	Branding and image	Marketing expenses	5% of annual gross revenue	
INTERNAL PROCESSES	Improved operational efficiency	Culpable delay days	0	<ul style="list-style-type: none"> <li>• Lean construction techniques: just in time, off-site prefabrication, last planner.</li> <li>• Analyse cause-and-effect mechanisms, draw conclusions and develop standards and systems.</li> <li>• Invest in software development.</li> </ul>
	Development of internal software	Construction waste Reduction Software implementation on all projects	5% 100%	
	Risk management	Risk register implementation on all	100%	
	Future trends	Use of recycled asphalt	20% of all projects	
LEARNING		Use of recycled concrete	10% of all projects	<ul style="list-style-type: none"> <li>• Promoting respectful cooperation, safe working, strong team culture and create attractive and future-proof jobs.</li> </ul>
	Continuous employee development	Attend an internal or external course Employee exchange and mobility	10 days per year 10 days per year	
	Procedures, standards and organizational structure	Defining company's procedures and standards Employee meeting and sharing experience	100% in 3 years 1 per month	
	Lesson learned	Creating a Lesson learned Register	100%	
	Employee satisfaction	Interview with employee ESI - Employee Satisfaction Index	1 per year > 70% for all employees	

Figure 3. Balanced Scorecard for construction company

## 6. CONCLUSION

The aim of this paper was to prove that decreasing profitability in the short-run by investing in the development of long term intangible assets can create long-term value to the company and help it better position itself on the market. This was proven by the example of STRABAG in the form of internal software development, which has helped in budgeting and cost reduction. For instance, "Common Project Standards" is a good example of defining minimum standards applicable to the initiation and execution of construction projects within the STRABAG SE Group. That document combines systematic and consistent risk management, process implementation responsibility, core application and process measurement. Another good example would be ARUP with Yearly appraisal, 'Working at Arup' - global membership engagement survey and Arup University, a place that brings together all the firm's learning opportunities, enables collaboration and knowledge sharing through the company's skills networks and provides information resources for all members. Construction companies can use Balanced Scorecard as a cornerstone of a new strategic management and measurement system because Balanced Scorecard retains a priority on achieving financial objectives but enables companies to track financial results while simultaneously monitoring progress in creating the capabilities and acquiring the intangible assets they need for future growth.

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## ИМПЛЕМЕНТАЦИЈА УСКЛАЂЕНЕ ЛИСТЕ У ГРАЂЕВИНАРСТВУ

*Резиме:* Овај рад представља Усклађену листу као систем мерења заснован на стратегији који служи за дефинисање и имплементацију стратегије. Грађевинске компаније често имају централизовану организациону структуру, неодређену визију и фокус на максимизирању прихода. Приоритет на постизању и одржавању краткорочног финансијског успеха може довести до тога да грађевинске компаније недовољно улажу у дугорочно стварање вредности, посебно у интелектуалну и нематеријалну својину која обезбеђује будући раст.

*Кључне речи:* Усклађена листа, стратегија, систем мерења перформанси