

Performance Measurement System for Strategic and Operations Management: Illustrative Case

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Abstract

Performance measurement systems (PMSs) are constantly evolving and although this evolution has the aim of promoting the improvement of quality information, it also generates a significant amount of data which, if not treated correctly, can result in useless information for decision-making processes. This paper presents a context analysis based on real business processes in a software development company located in southern Brazil, presenting an illustrative case to identify the applications (and roles) of a performance measurement system. In this specific case, several indicators were detected that may support needed areas and the decision-making process of the board, evidencing that the existing performance measurement system attends to the roles and functionalities expected and discussed during the article. However, the evaluated PMS is neither organized nor integrated, since each area has different and specific approaches for data collection and analysis, often leading to rework in the generation of indicators. In addition, it was found that the documented processes identified in the company did not match what was occurring within one of the areas (sales department processes).

Keywords

Performance measurement system, strategic management, operations management.

1. Introduction

Performance measurement systems (PMSs) are constantly evolving and, although the evolution has the objective of promoting the improvement of the quality of the information (e.g., accuracy, promptness, readiness) it also generates a significant amount of data which, if not treated properly, can result in useless information for the decision-making processes. Some authors have exposed that in an ever-changing, complex, volatile, and turbulent business environment, information management systems (IMSs) are a critical success factor for many organizations [1, 2]. Specifically in the performance measurement context, the IMSs should provide benefits such as increased speed and flexibility, improved control and operational/business efficiency, improved communication and support for effective business processes management [3, 4].

According to [5], performance measurement is a technique adopted to quantify the efficiency and effectiveness of business activities. In [6], the author argues that the successful implementation of performance measurement depends less on selecting the right measures and more on how the measures are implemented and used in the business. According to [7], through the development of information technologies, PMSs are increasing their capabilities with new features that enable better support for the organization in making decisions.

As exposed in [8], the use of performance measurement and management systems is often recommended to facilitate the implementation of the strategy and improve organizational performance. The authors also state that a PMS is responsible for maintaining the alignment and coordination of the operations. In [9], the authors have realized that for an effective use of a PMS, organizations need to have systematic mechanisms to extract measurement data and derive maximum value from them. In [10], the authors identified a consensus among researchers, considering that

PMSs play an important role in strategy, communication, management processes, organizational capabilities and performance, but there is inconsistency in the formulation and understanding of these functionalities. The authors in [11] propose that the PMSs have eight main roles that guide their adoption. Those roles are presented in this paper and were developed based on a framework that organizes and represents the relationship between the different use, capabilities and recommendations of distinctive PMSs [11].

According to [12], in the modern business world, global competition and increasing customer expectations require that the companies maintain the flexibility to accelerate changes in the operational environment, besides keeping the optimization and integration among business processes across functional levels.

This paper presents a context analysis based on real business processes in a software development company located in southern Brazil, presenting an illustrative case to identify the utilization of the performance measurement system. In this specific case, several indicators were detected, helping several areas and the decision-making of the board, evidencing that the existing PMS attends to the roles and functionalities expected and discussed during the article. However, the evaluated PMS is neither organized nor integrated, since each department has a different system of data collection and analysis, often leading to rework in the generation of indicators. In addition, the documented processes identified in the company do not match the real tasks performed within the sales department.

2. Basic theoretical foundation

Discussions on operations strategy began in 1969, when [13] rescues the strategic value of the operations function. In [14] the authors identify operations strategy as a pattern of decisions that contributes to long-term actions and to the global strategy. Those authors also state that operations strategy can be understood as the alignment of market requirements and organizations' resources, which reinforces the design and use of PMSs as a component of implementation in such alignment.

A performance measurement system encompasses the process of assessing the differences between actual and desired results, identifying and indicating critical aspects, differences, irregularities that have occurred and, where necessary, monitoring performance gaps. A PMS can operate as a 'thermostat' for measurement purposes, and to allow discussions related to patterns, assumptions and strategies [15].

A classic definition for performance measurement was developed by [5], stated as "a technique used to quantify the efficiency and effectiveness of business activities and actions". Efficiency relates to the relationship between the economic use of resources (considering a level of satisfaction) and an outcome; and effectiveness is related to the success in achieving what is wanted (meeting customer expectations). According to [5], PMS include process (or processes) for setting goals to gather, analyze and interpret data related to performance. The main goal of the process is to convert the data into information and to evaluate the effectiveness and efficiency of proposed actions.

Although performance measurement is important, it is not enough to manage the several aspects of a business. There is a need to complement a PMS with a component oriented to planning and operations strategy. That is, planning and management control elements complement each other [8].

The roles that characterize the use of PMSs have been on the research agenda of many authors, such as in [11, 16, 17]. In [17] the authors proposed five different categories for PMSs roles: (i) measuring performance; (ii) supporting management strategy; (iii) communication; (iv) influencing behavior and (v) learning and improvement for organizations. In [11], the authors consider that a PMS has eight basic roles, as exposed on Table 1.

Table 1. Basic roles of a PMS (adapted from [11]).

Roles #	Brief description
R1	Implement aspects related to strategic management within the operations strategy management. Promoting the improvement of indicators related to operational efficiency and effectiveness connected to the achieving of business objectives.
R2	Responsible for the strategy's roll out and monitoring the results of the business.
R3	Produce positive changes in organizational systems and processes.
R4	Develop a capacity to manage continuous improvement, adopting an integrated strategic management of operations.
R5	Produce positive change in organizational culture, contributing to the strategic vision realization.
R6	Produce an understanding closer to the needs of the market, creating value perceived by customers.
R7	Show how projects lead to desired results.
R8	Meeting external demands not directly managed by the organization.

3. Research project

Case studies conducted in operations management provide opportunities to improve comprehension on complex issues. This type of methodological strategy is carried out with the intention of studying an area not yet explored, or in situations where integrations / combinations between theories are necessary, contributing to the construction of new theories [18]. According to [19], a case study can be structured by three main needs/aspects:

- Being technically suitable for different situations with multiple variables of interest;
- Support for different sources of evidence, in which data must converge from a triangulation perspective, in particular when comparing documents, interviews and observations;
- Benefits from the previously defined development of theoretical propositions, guiding the data gathering. Also acting as a theoretical reference model and providing guidelines.

For this paper, the first step was mapping the company's business processes using interviews, direct observations and document analysis, followed by the mapping of the roles involved. The selected company works with information and communication technology (ICT) solutions focused on software development and products for the corporate market. The company operates in the public and private sectors with projects within Brazil and abroad. With a team of more than 250 professionals, including technicians with international recognition, the company offer solutions related to software development, training and consultancy.

4. Results

From the document analysis (e.g., manuals, protocols, and reports), direct observations and interviews, it was possible to map the actual processes, identify the use of the adopted PMS and point out techniques that may possibly help to improve the use of indicators and measurements. The general processes and workflows of the business areas were mapped and are illustrated in Figure 1 and Figure 2.

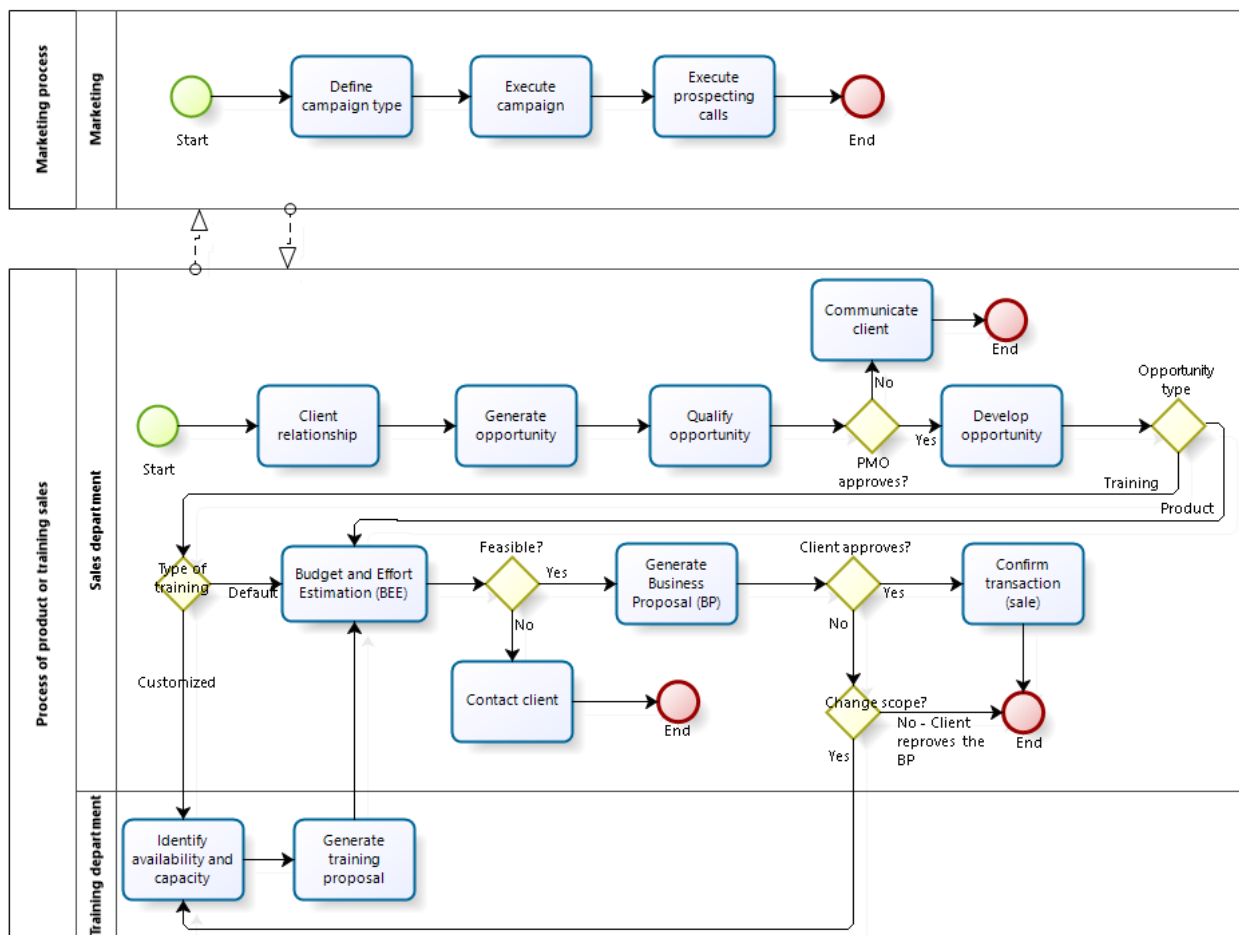


Figure 1. General workflow of the business areas.

The results on the use of the company's PMS are presented initially by department. The marketing area has some indicators, such as number of events, number of calls and their rates of return and number of leads. The PMS in the marketing department is related to strategic changes, connected with roles R1, R2 and R3 (as exposed in Table 1). The sixth role (R6, Table 1) could also be clearly identified in the marketing area when it refers to producing a closer understanding of customer needs.

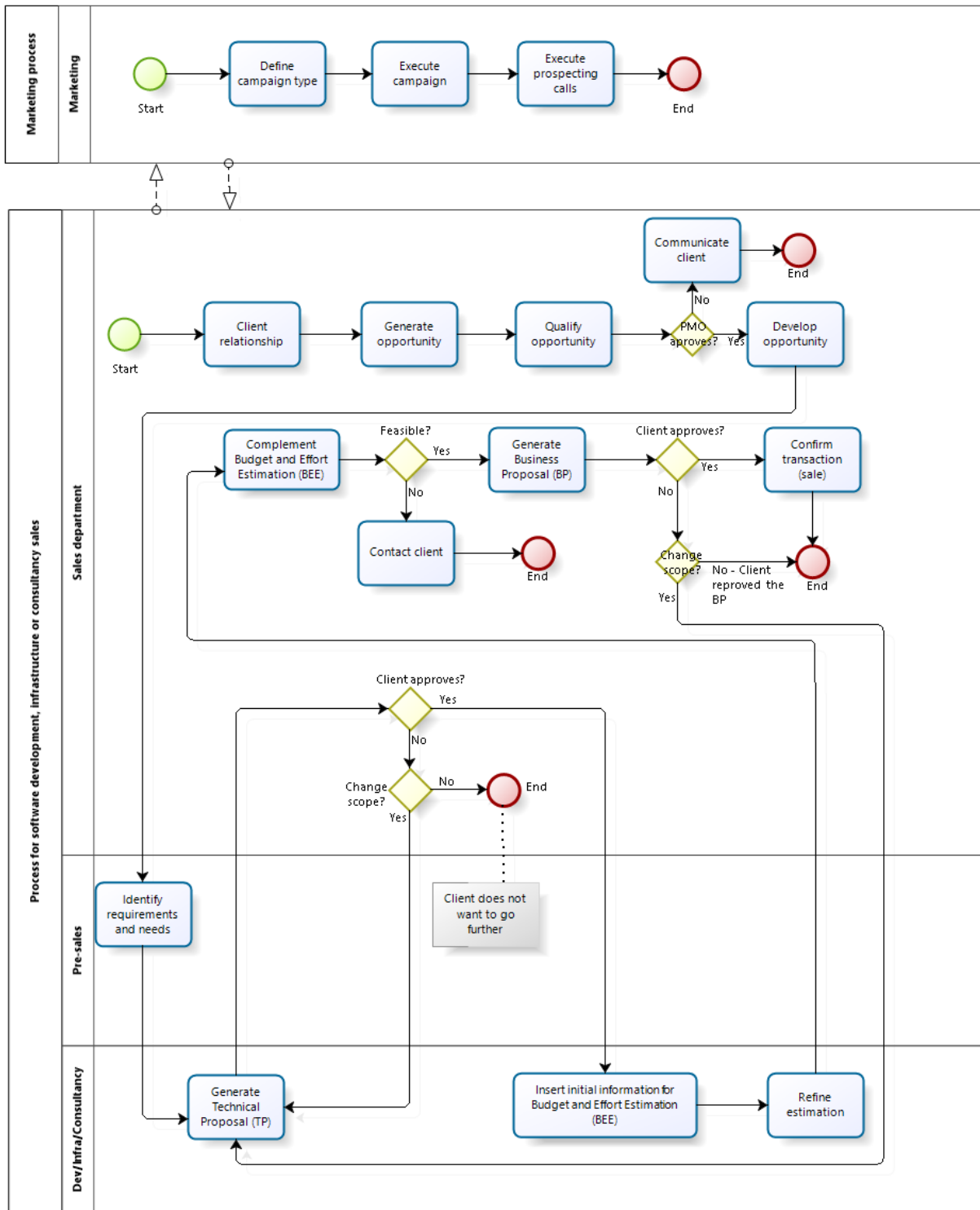


Figure 2. General workflow of the technical areas.

In the sales department processes (Figure 1), all the roles of a PMS (Table 1) can be identified. The indicators are discussed in weekly meetings in the department and helps promoting posture change, guidance, results monitoring

and continuous improvement. The indicators are also used to support strategic decision-making with the board. In the sales department the PMS is consolidated, thanks to the existence of formal selling processes as well as certifications such as ISO 9001, which require performance indicators and audits to be maintained [20].

In the software development department (third lane in Figure 2 – ‘Dev/Infra/Consultancy’) all roles of a PMS can also be identified. The main reason for this is the formal adoption/assessment of the Capability Maturity Model – for software development (CMMI©) [21], which demands the use of indicators (that are also used within the PMS). Other departments have some of the PMS roles, but they are not formal. Each department generates some indicators that are discussed in strategic meetings with the board, thus attending at least the roles R1 and R2 mentioned on Table 1. In general, considering all departments in different degrees, it is possible to affirm that the PMS of the company meets all the roles proposed by [11].

The lack of enough and complete data to generate indicators was a limiting factor, since it was not possible to access all data due to privacy and ‘sensitive’ issues. As a complement to this study, the identification of techniques that may help in the analysis of indicators needs to be tested. Adoption of decision-making techniques, statistical approach and evaluation in other companies are expected for future works, as similarly applied in [22-24].

5. Discussion

The focus of this the paper is to ‘assess’ (based on an application case) if the roles described in Table 1 exist in a company’s PMS. As the authors could verify (through interviews, document analysis and observations), the marketing department performs the roles R1, R2, R3 and R6. Therefore, it is possible to notice that the marketing department measure its strategic alignment of operations, in the pursuing both efficiency and operational improvement of business. The marketing department also deal with items related to the promotion of positive change in organizational systems and processes.

In the sales department all eight roles are carried out, since the indicators are monitored from the initial to the end phases of a sales process. The indicators are used at board meetings to support strategic direction. In the sales department, the use of PMS is well established, since it is supported by a formal methodology.

The software development department also implements all roles within the PMS context, providing support and measures for the strategic direction, customer orientation, stakeholder demand and organizational culture.

6. Conclusions

Considering the process mapping, it was possible to notice that the identified (and documented) processes did not match the reality of the sales department. The systematization of these processes can help in the effectiveness, efficiency and effectiveness of the sales of the company, consequently giving more assertive decisions.

It was verified that the company has different indicators (somehow related to the proposed roles) for different departments. The indicators help the decision-making of the board, however, the PMS is neither organized nor integrated, and each department has its own method and process of data collection and analysis, often leading to rework in the generation of indicators. Although the strategic management role of performance measurement systems (which includes R1 and R2) is well established in theory, many organizations have not yet implemented or are still unable to do so in practice.

This study had restrictions to access some performance indicators of the company, restricting more in-depth analyzes. It is also important to clarify that this is just a single illustrative case, not representing several other companies (even within the same sector). For future work, it is suggested to carry out other cases in similar companies and to propose ways to assist in the collection, analysis and treatment of their data and indicators. It is already ongoing a proposal of a better approach to extract, treat and analyze data, considering also the application of adequate descriptive and multivariate statistical techniques for the indicators. In complement, the idea is to perform further verification of the influence of those techniques in the roles of performance measurement systems.

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