



Tactical Business-Process-Decision Support based on KPIs Monitoring and Validation

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ABSTRACT

Key Performance Indicators (KPIs) can be used to evaluate the success of an organization, facilitating the detection of the deviations and unexpected evolution of the behaviour of a company. The difficulty for enterprises is to ascertain what to do when a deviation is detected. In this paper, we propose a modelling approach to improve the operational business-level and to ascertain the possible actions that can be executed to maintain the right direction in a company. For business process-oriented companies, it entails knowing how KPIs can be affected by the business processes. It implies not only pointing out that a system malfunction exists, but also to know what to do when a deviation is detected. Our proposal presents a methodology that covers: (1) an extension of the existing models in order to combine KPIs, goals of the companies, and the decision variables together with business processes; (2) a methodology based on data mining analysis to verify the correctness of the enriched proposed model according to the data stored during business evolution, and; (3) a framework to simulate the evolution of the business according to the decisions taken in the governance process, thereby supporting governance activities to achieve the defined objectives by exploiting goals and KPIs from the proposed model.

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1. Introduction

The IT Governance Institute (2001) defines enterprise governance as the “set of responsibilities and practices exercised by the Board and Executive management Team (BET) with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that the enterprise's resources are used responsibly” [4].

A business plan is a document that details the activities of an organization and examines how and when the objectives can be achieved [26]. A business plan contains a set of sections that details every aspect of the company, in which the BET apply foundations of the Theory of Organization [44] and related techniques, to describe how the company and how to achieve its objectives. The sections of a business plan contain, amount others, operational section (operational plan) and strategic section (strategic plan). Operational plans describe in detail all the actions that can be performed

in the company, meanwhile strategic plans describe the objectives (the right direction), and how to achieve them.

In order to support the operational plan, companies are able to incorporate a commercial Business Process Management System (BPMS). BPMSs represent software that supports the implementation, coordination and monitoring of the business process execution, allowing companies to manage the entire process life-cycle of the business processes. BPMSs operate as orchestrator that can be integrated with other systems existing in the company, such as Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM), which allows reaching a better automation to the operational plans. The information related to the status of the business keep stored in these systems, for this reason, in order to analyse the status of the business and his alignment with the right direction, companies can incorporate Business Intelligence (BI) techniques that monitoring their data values and the satisfiability of the indicators.

However, BI tools are not aligned with the whole life-cycle of the decisions made in the companies to satisfy the strategic plan. This misalignment makes difficult to know what to do if a functional deviation is detected, or how the business can evolve according to the operational decisions that can be made. At the management level, the BET does not make the low-level decision in

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actions under-performing [54], at management level, they must make decisions about what action perform to maintain and follow the agreed business strategy, thus the right direction. In order to make the best decisions, three aspects must be analysed: (i) model the relation between the elements of the organization (i.e., measurements, goals, processes) by the business experts; (ii) verify the correctness of the expected model with the real values extracted from the behaviour of the company; and, (iii) simulate how the decisions can affect the evolution of the organization in the future.

The execution of each business process is able to contribute towards achieving one or more business goals. In order to gain information about the business process efficiency according to the desired business objectives, activities represented in controlling mechanism are performed, and Key Performance Indicators (KPIs) of business processes are determined [51]. Performance Management Systems (PMSs) are concerned with defining, controlling and managing both the achievement of outcomes or ends and the means used to achieve these results at a societal and organisational [5]. One of the objectives of a traditional PMSs is to create a consistent approach to extract, analyse and report information about the performance of the company. PMSs are used to know if systems are working as expected, comparing the expected model with the observed information. For this reason, we need to have the capacity to create a model that represents the expected behaviour (achieve the defined goals according to the KPIs and KRIs). It is, therefore, necessary to create a combined model of influences where processes, goals and measurements are able to be combined. Meanwhile, the BI lets analysis of the information stored in the systems of the organization to evaluate the achievement of the strategic plans, our proposal creates the model according to these plans to help BET making decisions aligned with them. The ability to analyse extracted information and help in decision-making is being associated with PMS frameworks [52], therefore our proposal could also be categorized as a PMS framework that analyses the data according to the defined model and simulating how each action can affect the evolution of the system.

In this paper, the approach deals with the older modelling in management science [40], such as systems dynamics. It includes how the execution of the business processes used by the

organizations can affect the indicators and goals. In process orientation, business processes are the main instrument for the organization of the operations of an enterprise [16]. This implies that the overall organization can be seen as a set of business processes, working together to achieve the objectives of the company. Organizations can incorporate various types of business processes, and they are influenced by the strategic plan that defines the objectives and goals, but they are also influenced by the stakeholders and the information systems that support them.

When business process models are included in the decision making, new challenges must be faced derived from the decisions related to the input data introduced in the business process models, and that affects to the achievement of the objectives of the organisation. In this paper, the business management helps to decide which operation has to be carried out. It is typically a human and manual task, the BET of the enterprise uses indicators, frequently shown on dashboards, to decide which actions to take to improve the indicators in the future. The relation between the operations and how they can affect the measures and indicators is not always clear, since it depends on the background of the particular decision-maker and the complexity of the relations. Thereby, it is necessary to verify the correctness of the model in accordance with the history of the company. To create a model that fits with the reality allows for simulating how the decisions might influence to the indicators, and reduces the errors produced by incorrect decisions that fail to follow the strategy defined in the organization.

In order to extend the management of the strategic plans with business processes (i.e., modelling, verification and simulation), we propose a methodology consisting of 5 steps, as shown in Fig. 1 used as guide to present our proposal:

- 1. Creation of enriched models by Business Experts:** In this paper we propose the use of model-based fuzzy logic graphs that represent the relation between KPIs, Goals, Measures and the processes of the companies. Fuzzy Governance Maps (FGMs) were introduced in [42], but in the current proposal the types of elements are extended. Since there are several factors involved in the decisions of an organization, FGMs are able to be defined by parts, from different points of view and from various business experts as shown in Fig. 1.(1). Different KPIs can be defined from

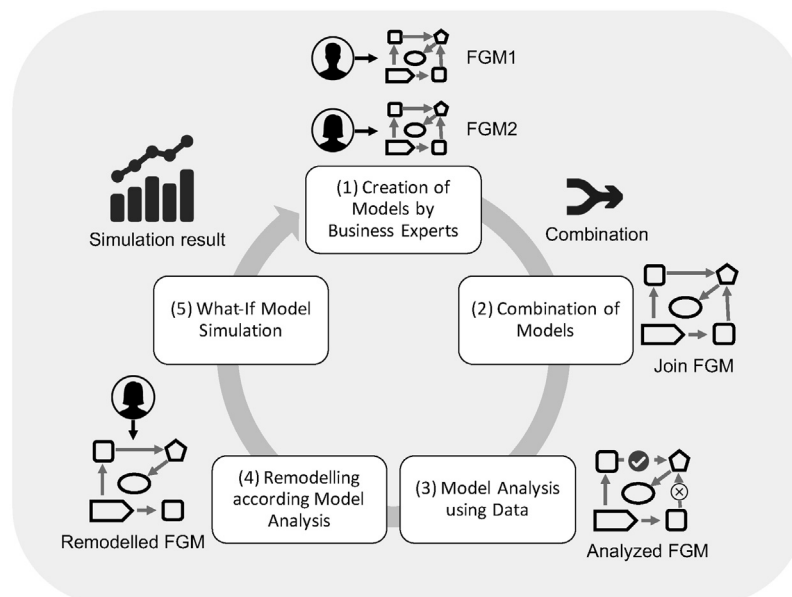


Fig. 1. Life-cycle proposal for improving Decision-Making based on Business Models and Measurements.

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