REPRESENTING BUSINESS STRATEGY THROUGH GOAL MODELING

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Abstract: This paper focuses on the representation of business strategy through goal modeling. Traditional approaches to goal modeling focus on capturing the business goals into an accurate representation. Business goals originate from the vision and strategy of the company being modeled. By restraining to model the business goals, traditional approached often fail to capture the meaning of goals and the managers' vision of business. By capturing some of the concepts underlying management theories such as the Balanced Scorecard, a new approach to goal modeling is presented. This approach aims at providing a modeling language that is closer to the manager's and business needs.

1. INTRODUCTION

In today's hyper-competitive market, companies tend to see themselves as integrated in a value chain that links the initial supplier to the final consumer. A new way of managing business is rising, as managers begin to view the organization in terms of business processes instead of functions. Each business process integrates activities from various organizational functions in a cross-functional value stream.

In this context, Business Process Modeling (BPM) emerges as the research area encompassing tasks such as representing and measuring the performance of the processes that describe the organization's core business.

However, the continuously business changing environment causes yet another great problem since the traditional managerial tool for performance measurement of business behavior is the financial accounting of costs. This tool is still in use on many of today's organizations while they strive for building internal capabilities and strategic partnerships with external entities. The major issue on using a purely financial tool in strategic plan measurement is that most of the strategic goals the company is attempting to accomplish (e.g. innovative processes, worker's motivation and skills, client loyalty) are not easily associated with a financial value (as opposed to the tactical and operational goals). This scenario gave way to a new management tool, the Balanced Scorecard (BSC) proposed by Kaplan.

The aim of this paper is presenting a new approach to goal modeling. By further refining the way goal models are structured , it is possible to overcome most of the problems which constrain traditional goal modeling. By looking at the business goals in the BSC perspective , it is possible to increase the expressiveness of goal models, capturing more knowledge not only about the overall business but also concerning strategic and operational goals.

This paper is structured as follows: next section introduces general issues relating to business modeling and focuses the research of goal modeling. Section 3 proposes an approach to goal modeling. Conclusions and future work are presented in section 4.

2. BUSINESS MODELING

Creating a model of a dynamic and highly non-deterministic entity, such as an organization, is an extremely difficult, if not even impossible, task. Nevertheless, the creation of this abstraction of the

real world is fundamental to allow managers to focus on the important problems.

2.1 Business Process Modeling

Business Process Modeling aims at describing the structure and behavior of the core business processes so that the actual value adding processes are identified

Even though there is no standard definition of business process, we use the one presented by Eriksson and Penker: *business processes are collections of activities that take one or more kinds of inputs and create an output that is of value to the costumer. Business processes have goals and are affected by events occurring in the external world or other processes.*

However, this definition requires some concepts commonly referred in BPM literature to be clarified:

- *Resources* are objects within the business (in the sense stated in the previous section) that are manipulated through processes. Resources are arranged in structures and have relationships with each other;
- *Goals* represent the purpose or the outcome the business as a whole is trying to achieve. Goals can be broken down into sub-goals and allocated to individual parts of the business (such as processes);
- *Rules* are statements that define or constrain some aspect of the business and represent business knowledge, modeling how the business should be run.

This paper is primarily focused on the challenge of modeling business goals.

2.2 Goal Modeling

The approach to goal modeling taken in this paper is mostly based on the goal patterns described by Nilsson. This approach towards goal modeling is based on the following notions:

- *Goals* control the behavior of the business and show the desired states of some resources in the business;
- *Problems* are obstacles that hinder the achievement of goals. They are related to goals, in the way that they not only express adverse conditions to the accomplishment of business purposes but also give way to the creation of new goals that aim at eliminating problems (these goals are usually sub-goals of the one associated with the raised problem);
- *Contradictions* between goals arise when two mutually exclusive goals exist.

In this approach, two sub-goal classes are defined, the Quantitative Goal and the Qualitative Goal. A Quantitative Goal is aimed at describing goals that can easily be measured through some value that is to be achieved. On the other hand, a Qualitative Goal requires human judgment to verify its achievement since it is difficult to describe in measurable terms. Qualitative Goals must have an associated goal description. Quantitative Goals, besides having a goal description, have also a goal value, a current value and a unit of measurement. Goals can be hierarchically related or merely linked to each other (such as contradictory goals).

Problems, as goals, can be decomposed into sub-problems. Since a problem is always associated with a goal, the hierarchy of problems usually reflects the hierarchy of goals (as was referred in the beginning of this section, usually a sub-goal is created in order to eliminate a problem associated with it's upper goal).

3. A NEW APPROACH TO GOAL MODELING

The Balanced Scorecard is a tool for translating vision and strategy into action and measuring the result in light of the adopted strategy.

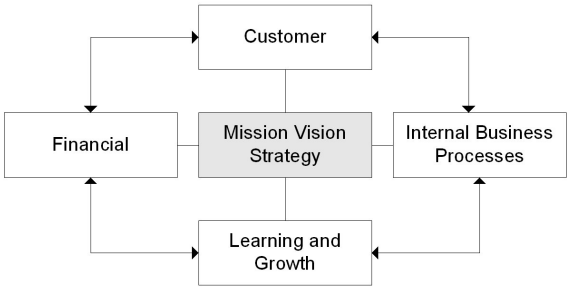

Figure 1. The Balanced Scorecard.

The fundamental concepts expressed in a BSC can be summarized in the following two points:

- Distinction between operational and strategic goals and measures: the operational goals are usually associated with short-term returns the company must achieve. Strategic goals concern long term strategic purposes the company must meet.

- Four different kinds of goals: the goals inherent to each one of the four different perspectives (financial, client, internal processes and growth and learning) express the company's vision and strategy. The fundamental concept to catch here is that these goals have different origins in different perspectives over strategy. In order to capture strategy, we must consider goals as well as their origin.

Previously, we identified goals, problems and contradictions as the fundamental concepts regarding goal modeling. Goals are classified as qualitative or quantitative and the authors state that further classification should be added in accordance with the requirements of the particular business being represented. We would like to propose a further classification for goals and relative concepts.

Following the concepts identified in the BSC, we propose the creation of two goal classifications. Besides being *qualitative* or *quantitative*, we find it necessary to classify goals as *strategic* or *operational*. Each of these require an attribute of it's original business *perspective* (inducing a second classification line) and are further classified as qualitative (*qualitative strategic goal* and *qualitative operational goal*) or quantitative (*quantitative strategic goal* and *quantitative operational goal*). Strategic goals have *time scope* as an additional attribute in order to represent information about the strategy's timing.

Although dependent from goals, we do not required to refine the classification of problems. Problems are stated in plain text and are always dependent of related goals, they have all the expressive power needed to adequately represent manager's concerns with regard to particular goals.

However, contradictions between two or more goals could benefit from a further detailed classification. Since goals can be classified as strategic or operational, contradictions between goals can have different meanings. If a contradiction between two strategic goals is detected, a *strategic contradiction* is created and the related strategic options must be reviewed or properly weighted (possibly leading to further evaluation of future scenarios and strategic positioning). If a strategic and an operational goal are inconsistent, a *strategy implementation contradiction* is detected and the measures applied to enforce the strategic path should be revised considering that it causes short-term problems. If two operational goals are inconsistent, an *operational contradiction* is created and both goals should be revised in the supporting process.

The major purpose of making such distinctions between apparently similar conditions is not to automatically resolve contradictions but to draw attention from business participants to consider deeper thoughts on strategic planning when facing such situations. Rather than observing that two goals are inconsistent, managers would be alerted, for example, to the fact that strategy is not being well formulated or implemented, or that there are conflicts between internal and client goals, by observing the type of the contradiction and the goals involved.

3.1 The Goal Stereotype

As discussed previously, the main concept supporting goal modeling is the goal. The stereotype that formally defines this concept using UML has the following characteristics:

- UML meta-class extended: Class.
- Semantics: represents a goal that was originated by a certain perspective of the organization's strategy and must be described in natural language.
- Diagram Notation: the notation uses the alternative icons in Figure 2 with the stereotype «goal».

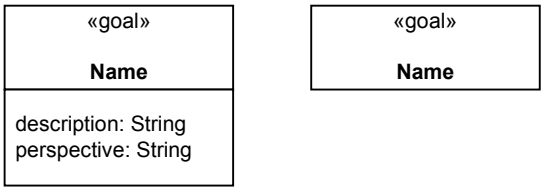

Figure 2. Goal stereotype icons.

- Figure 3 describes the meta-model.

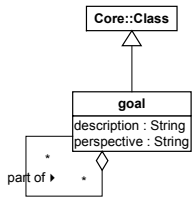

Figure 3.Goal meta-model.

- Predefined Goal Classes: according to the new concepts introduced in section 3, there is the need for creating the following predefined classes (Figure 4).

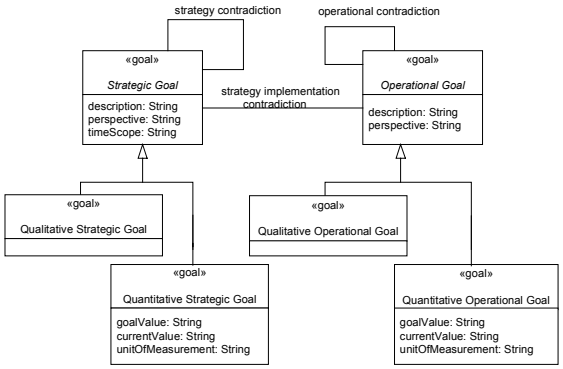

Figure 4.Predefined goal classes

Problems can be represented as instances of UML *note.*

4. CONCLUSIONS AND FUTURE WORK

The introduction of strategic analysis concepts in modeling languages forces modelers and business participants to structure the process of representing business information. There are two advantages in this approach:

1. By organizing information using well defined concepts, the modeler and the business participants are able to perceive the lack of representation of inherent information;

2. By including information about each goal source, the model expresses information about the strategy supporting the set of goals.

Although the introduced extensions bring additional expressive power, much has to be done to allow models to capture business strategy and to pass it to the supporting business processes.

One of the studies that would largely benefit the representational power of goal models is the exploitation of goal hierarchical decomposition. By extending these relations with concepts from business management theories like the Balanced Scorecard, better models could be obtained.

In our opinion, the most fertile aspect of goal modeling with regard to these extensions is the relation between goals. According to Kaplan, the Balanced Scorecard should be built for every business unit along the hierarchical decomposition of the organization. This decomposition, used jointly with the implementation of strategy in specific tactics and goals, is a sound basis for increasing the expressive power of goal models. Therefore, we conclude that we are still far from getting to an end in the quest for representation of business goals and strategy.

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