Implementing GPI, a language for Organizational Alignment

Henrique Prado Sousa, Julio Cesar Sampaio do Prado Leite

Pontifícia Universidade Católica do Rio de Janeiro, Rio de Janeiro, Brasil
{hsousa, julio}@inf.puc-rio.br

Abstract. Organizational alignment aims to align strategic, tactical and operational decision levels in a given organization. The traditional operational view, focused on processes, produces gaps between strategic and operational layers. As such, many tools and techniques were developed giving more focus on one of the layers failing to promote their integration. In our current research, we are trying to identify ways to better represent organizational alignment, for an improved organizational analysis. Following in this direction, we integrated a process and a goal modeling notations (BPMN and i*) and inserted metric oriented elements, generating the GPI (Goal, Process and Indicators) language. Then a tool was created by reusing the Oryx architecture. This paper briefly present the GPI language, details its implementation in the Oryx editor and reports on ongoing research on alignment based on this infrastructure.

Keywords: GPI tool, Organizational alignment, i*, BPMN, Business process modeling, Goal modeling.

1 Introduction

Organizational alignment is a business non-functional requirement that aims to increase adherence between the operational, tactical and strategic decision levels of an organization. It means that what is defined at the strategic layer, must be fulfilled by the others layers. In order to reach that goal, business components must be in accordance towards the strategic decisions of an organization. Business alignment targets efficacy, compliance with strategic goals, whereas efficiency is usually more of an operational concern as to maximize productivity. However, filling the gap among these layers is not a trivial task, since each one has a different focus and concern. Notwithstanding the difficulties, it is important that a mapping of these layers allows for an analysis in a way to identify problems and opportunities for improvement.

Modeling business layers requires a suitable language to describe the particulars of each level. GPI, a modeling language, is an ongoing research study on a way of linking these layers offering more analysis capability. GPI is being designed to allow a smooth transition among goals, at different abstraction levels, and processes as operational implementation of these goals. As to enforce the trace among the layers and a way of evaluating effectiveness, indicators are used as a standard measure (indicators

are not detailed in this paper). A design decision took from the start was to reuse resources of languages that were already available and to adapt them to be integrated in a manner to help alignment analysis. The reuse of elements does not mean that all of their semantic will be present in GPI, once the integration between process and goal layers has its own rules (which are still under study). We have chosen BPMN and i* as the main languages to be integrated, and performed the integration by the inclusion of abstraction levels for both the goal concept as well as for the process concept. With this, a new architecture of organizational modeling was proposed. Following we will focus on the GPI language and its implementation using the meta editor Oryx.

2 GPI Language

GPI language is being designed to fill the gap not dealt by other business oriented languages, for example: lack of business elements, only process or goal models, lack of enough connection semantics, insufficient traceability, lack of alignment analysis resources and methods, and nonstandard graphical design used in notations.

To design a language that offers elements to deal with these difficulties, we defined a new language and architecture with more levels of traceability, different layers of abstraction and a goal modeling method. To do this, we are following a four step process: 1. Choose goal and process notation (done); 2. Identify similarities between notations (done); 3 – Establish integration toward alignment contribution (partially done); 4 – Evolve the language, establishing new modeling methods and operationalizations towards organizational alignment (under study).

In the first step - choose goal and process notation - instead of creating other elements to represent the same definitions existent in many consolidated notations, we decided to choose different languages for the layers, choosing among the most known and/or used languages available (based on our experience). In the goal layer we analyzed the languages: GRL [7], i* [17], NFR framework [4], Goal models of ARIS framework [12] and the UML extension proposal [6]; in the process layer: UCM [1], EPC [12], BPMN [10] and the UML extension proposal [6]. After some study we conclude that the best languages to use in this work were i* and BPMN (more details see [14]). Some justification, briefly: BPMN is an international standard and is also supported by many free modeling tools, reaching a large number of users; i* has more semantic connections between its elements (and is one of the goal languages most studied nowadays).

In the second step - identify similarities between notations - we mapped similar elements between notations. For example, an actor is similar to a pool, representing a role and a place where main business elements under his responsibility are delimited in the model; a resource is similar to an artifact, and a task is similar to an activity, representing actions executed by actors/agents. Other elements, for example, decomposition and means-end relations from i* need a case by case mapping. Some elements marked as similar between i* and BPMN may have only a partial semantic similarity, being different when considering specific states. In these cases we made the link as convenient to GPI goals. The full study of similarities can be seen in [14].

In the third step - establishing integration towards alignment contribution – we defined the integration oriented by 5W1H [9] in order to provide elements and connections enough to maintain traceability among business elements and layers. We try to answer questions based on What, Why, Where, When, Who and How, mainly when the answers are present in other layers. For example, making the following question considering a specific goal, in a goal layer: What are the partial products developed in order to reach this goal? Who are the key responsible roles of this goal? When this goal is reached? Or from operational layer: Why this role does these steps? Changing a specific activity, what goals will be affected? Then the GPI language must enable a level of traceability and detail enough to link high level elements to all low level operational elements and also to enable the model to answer 5W1H questions.

The results we achieved led to explicit elements that increased business model detail, thus leading to a new layer (aka the tactical level). It helps, for example, to the understanding of the connection between individual efforts and the overall business goals. Considering that every element only exists because of some business "goal", it is important to connect them to, for example, justify their existence, or still, correctly identify responsibilities and process execution fails.

This new layer was inserted between the level of traditional business goals and processes. This layer (for now, we call "intermediate layer") is an intermediate goal layer that is specific to represent agent/role goals, which are the closest of the operational level (Fig. 1). Indirectly, these goals (for now, we call "local goals") are the decomposition of high level goals, linked to their respective part of operational layer. The insertion of this layer helps to reduce the gap between traditional goal and process layers in the cases that their integration is made only by linking a goal direct to a process no matter what his size and complexity are. In this case, much information about how process achieves their goals is lost. It also helps to justify, from the point of view of actors, the execution of their activities.

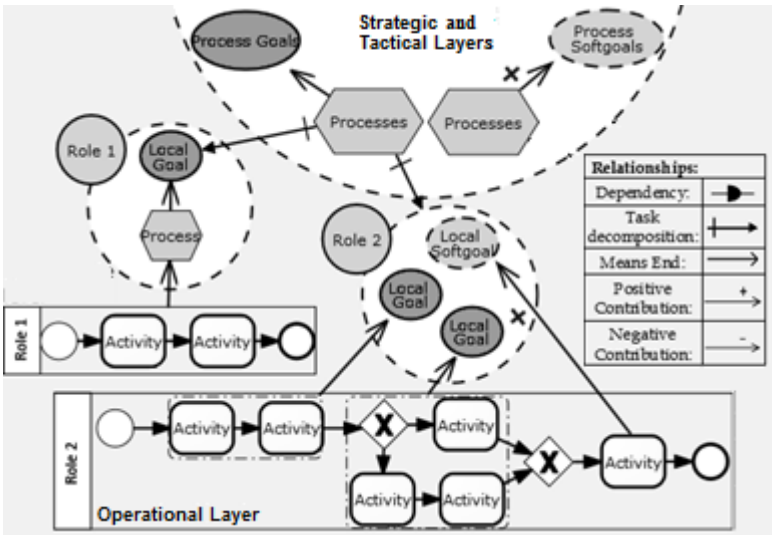

Fig. 1. Relationship of "local goals" and traceability through layers

The intermediate layer is inspired on i* Strategic Diagram ideas, considering actors of processes as agents and representing its strategic reasoning. The same idea is presented in the strategic layer, but considering the business as the actor of its high level goals and macro processes. The strategies in this layer are the high level business reasoning applied in the value added chain.

The main diagram of GPI enables the modeling of these three layer together (for now, we are calling "Integrated Diagram"), in order to create a general view that can contribute to alignment analyzing (Fig. 1).

In the fourth step - evolve the language, establishing modeling methods and operationalizations toward organizational alignment – is our current study that focuses specifically on the alignment issue. We expect that during the evaluation of the GPI we can identify elements that will help in the evolution of language, on the operationalizations that contributes to alignment and its analysis, and on the definition of a method to better take advantage of the intermediate layer.

3 GPI tool construction

The GPI language was implemented by reusing the Oryx [11] open source tool. Oryx is an academic framework with a special architecture that permits the inclusion of new notations by defining them using the Oryx language.

In this language, a notation is defined by a "Stencil set" that is composed essentially by properties of elements (i.e. id, title and description) and some pre-defined rules which establish the interaction between the objects (i.e. connection, cardinality and containment rules). Each stencil represents an object, but the stencil set is a singular file written in JSON (JavaScript Object Notation - json.org) language. Oryx also allows the definitions of "extensions" that enable the insertion or exclusion of selected stencils or a complete Stencil set (**Erro! Fonte de referência não encontrada.**).

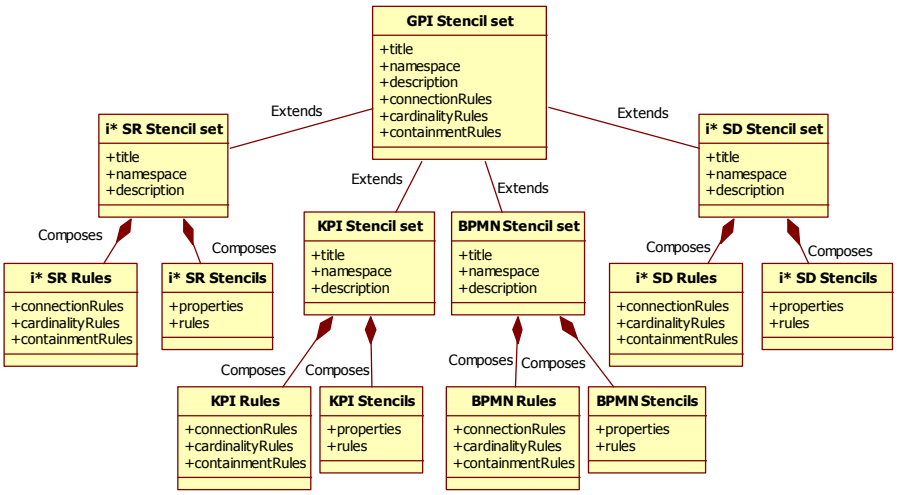

Fig. 2. Stencil set GPI and extension schema [adapted from 16]

It permits to define some "views", for example, to show basic or advanced elements. In our case, the extensions were used to allow the quick change between the languages. To organize the tool this way, a stencil set was defined to each kind of diagram involved: i*SR, i*SD, BPMN (Oryx native BPMN 2.0 stencil set was reused) and KPI. The stencil set GPI is configured to accept all others elements, then it is extended by others stencils set according the perspective selected by user. It means that "GPI tool" supports not only the Integrated Diagram, but also i* Strategic Diagram, i* Strategic Reasoning and BPMN languages. In the case of Integrated Diagram, the GPI tool enables i*SR, BPMN and KPI stencil sets, in addition to its own stencil set that contains the integration rules divided between connection, cardinality and containment rules.

The potential of Oryx tool was not completely investigated. The Oryx Core may be customized in order to insert new functionalities to the tool, like automated model analysis. This line of customization will be studied as part of our ongoing research.

4 Discussion

The GPI language introduces a new proposal of business modeling that helps to investigate alignment. Some elements, not before emphasized, are now demonstrated as an important component to interconnect goal and operational layer.

This new approach may demand a specific method of information elicitation, which we will pursue. Modeling business and goals to perform organizational alignment analysis must be improved, to reduce cost due to rework if goals are not being pursued by operational level, or pursued in an inefficient way. Then, "alignment analysis" needs to be improved by adequate methods and techniques.

Some issues also must be investigated. The complexity of GPI business models grows because more visual information is necessary. The same happens with modeling business using GPI because of the existence of a new layer. But it can be mitigated by analyzing alignment from the viewpoint of one macro goal, what will modularize the models and reduce the number of business elements. It is also possible to factor business process modeling using different methods, for example, starting it from the intermediate layer followed by goal and process layers, like the middle-out approach; or first modeling goal and process layers to after linking them by the intermediate layer, like the meet-in-the-middle approach.

The Integrated Diagram helps on making a model more transparent, mainly considering the explicit local goals and the link with business process and goals, establishing a high level of traceability and clearly contribution of each actor. It addresses the problem of making employees knowing their role in the job. With the use of "local goals", we expect to identify deviations of understanding, tacit knowledge, and lack of traceability links to activities or goals demonstrating misalignment. To complement the language, it was included in the operational layer the Business Rule and KPIs. GPI also has a proposal to use KPI in a manner to enable alignment analysis.

Other works as [1], [3], aims to help business alignment by introducing specific elements. In [1] is proposed a traceability link to interconnect goal and process (as sce-

narios); in [2], it is used a goal taxonomy in order to harmonize the goal domain to subsequently align process models. Other works [4], [8], [13] evaluate alignment by using KPIs. GPI proposal is a specific business and goal modeling language that brings up a new approach in order to alignment analysis by modeling concepts that improve traceability and detailing among layers.

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