

ENHANCING ORGANIZATIONAL SELF AWARENESS

The As-is Enterprise Model Dynamic Updating Process

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Abstract: The aim of the work described in this paper is to set up the as-is enterprise model continuous updating process and to develop a supporting tool. The as-is enterprise model continuous updating process uses the annotations as a mechanism to put the business actors “talking” with the representation of their activities, either in action and interaction contexts, extracting knowledge and turning it explicit in the as-is enterprise model. The business actors can act as active updaters of the as-is model through the comparison between the modelled activities and the ongoing real executed activities. In this way, the enterprise model, which represents several aspects and perspectives of organizations, can help building and maintaining organizational self-awareness by adding knowledge to several organizational levels (individual, group, process/functions). The process and the supporting tool are running in a governmental organization and the results revealed that they could have an important role, not only in gathering the information needed to update the model, but also allowing the opening communications channels to share and acquire additional organizational knowledge.

1 INTRODUCTION

The enterprise model can help building organizational self-awareness, adding knowledge to several organizational levels. In order to achieve this goal, the model must be an updated, trustworthy and reliable representation of the business processes and activities, allowing capturing, representing and distributing the organizational knowledge. However, the typical usage of the model, as support to some organizational activities restricted in time, and the recognized difficulty in maintaining it updated and aligned with the reality, have prevented the enterprise model to become a solid foundation to support the organizational daily activities acting as an organizational knowledge repository.

The work presented in this paper aims to establish a process to automate and streamline the management and updating of the business model in order to align it with reality, using the annotation mechanism.

In the next section some of the contributions to this work, in the areas of Organizational Engineering, Organizational Knowledge and Annotations, are described. Then, in section 3, the as-is enterprise model dynamic updating process (called PROASIS) is presented. The supporting tool to support the

process (called MAPA) is presented in the section 4 of the document. In the end, some results from the use of the process and tool in a governmental Portuguese organization are presented, as well as the conclusions and future work.

2 RELATED WORK

The enterprise engineering bring together concepts, methods and technologies which allows to understand, model, develop and analyse all the changing business aspects through the focus on the relationships and dependencies among strategy, processes and the supporting information systems (Tribolet, 2005a).

Starting with the following definition of organization (Tribolet 2005b), (Magalhães 2007): "An organization is the result of the actions of their human and non-human actors arranged in socio-technical systems that are self-held through the actions and interactions of its components, which have, as a differentiator factor from the remaining human creation, the fact that human agents are involved in their formation", the organizational self awareness concept appears naturally as the result of

the complex intersection of various consciences - individual, group, function and process - that guide the current action in organizations, depending on the contexts invoked.

The enterprise model allows communicating, documenting and understanding the organizations activity (Caetano 2004a). It has a key role in the representation of knowledge and organizational self awareness, and can act as a subject of conversation to incorporate more knowledge in an iterative and incremental way. This role can be accomplished due to their intrinsic characteristics in representing organizational actions and interactions aggregated in processes which, in turn, are orchestrated sequences of activities. The processes and activities are the elements that contain all the information about how, when and who does the work flow (Magalhães 2007). The primitive, the syntax and semantics of the business model should allow simple and immediate verification from each of the organizational actors from the reality of their continuing action, once the basis of representation must be developed in concrete activities, because this is the only truly verifiable and comprehensive basis which organizational stakeholders can use (Tribolet, 2005b).

The enterprise model have to accommodate different points of view, the individual, the organizational, and the views of various groups of actors grouped in organizational contexts, but at the same time the consistency of the whole model has be guaranteed, allowing to represent the organizational self awareness (Magalhães, 2008).

In the modern definition of organizational knowledge, organizations and the organizational knowledge it self are deeply related, since the theory of knowledge creation is supported by the individual interpersonal and group relationships and depends on facilitation contexts (Magalhães, 2005).

The organizational learning area sees organizations as cognitive entities, capable of reflecting on their own actions, conducting experiments to study the effects of alternative actions, consequently modifying their actions (Boudreau, 1996).

Nonaka and Takeuchi (1995) define organizational knowledge as "the ability of a company, as a whole, to create knowledge, disseminate it through the organization and incorporating it into products, services and systems". The conversion of knowledge (transition from tacit an individual knowledge into explicit knowledge) allow it use and sharing by all, serving to create new knowledge (Nonaka, 1995).

The organizational knowledge can reify (making it explicit) through the enterprise models with the

contribution of the individual knowledge of all who work in organizations, highlighting the need to promote the use and usability of organizational models. To achieve this it is necessary to know the interaction dynamics between the different organizational actors. The "context" concept is a key element helping in filtering relevant information among all business actors trough the management of the interactions (Zacarias, 2004).

In general, the annotations are an addition of information on a particular section of a document or other entity providing information. Annotations have specific uses in several distinct areas like biology, law science, linguistics, programming languages, modelling languages, to name a few.

The use of the annotation concept in this work is based on its use to capture the reasons for the changes that are normally made in software projects caused by the implicit knowledge of development teams (Becker-Kornstaedt 2002). The annotations should capture the activities, resources (entities) and the context involved (flows). The continuous improvement of processes requires that the experience is captured to be continuously incorporated into business processes and continually portrayed in the as-is model. The systematic capture and storage in the context where the experience was captured has three major benefits (Becker-Kornstaedt 2002): the experience gained can become explicit, the experience may be incorporated in the description of the process and the analysis of the experience can be reused in other processes for process improving.

3 PROASIS

The idea explored by defining the as-is enterprise model dynamic updating process (PROASIS) is based on the analysis of misalignments between the distributed model and reality.

3.1 Key Ideas for Updating the Enterprise Model

The updating process is executed by the people (organizational actors or agents) who perform the activities that compose the organizational processes, using the annotation mechanism.

The annotations allow making proposals for correcting the model (corrective maintenance), capture changes in action or interaction contexts (adaptive maintenance), making free comments that could anticipate problems (preventive maintenance)

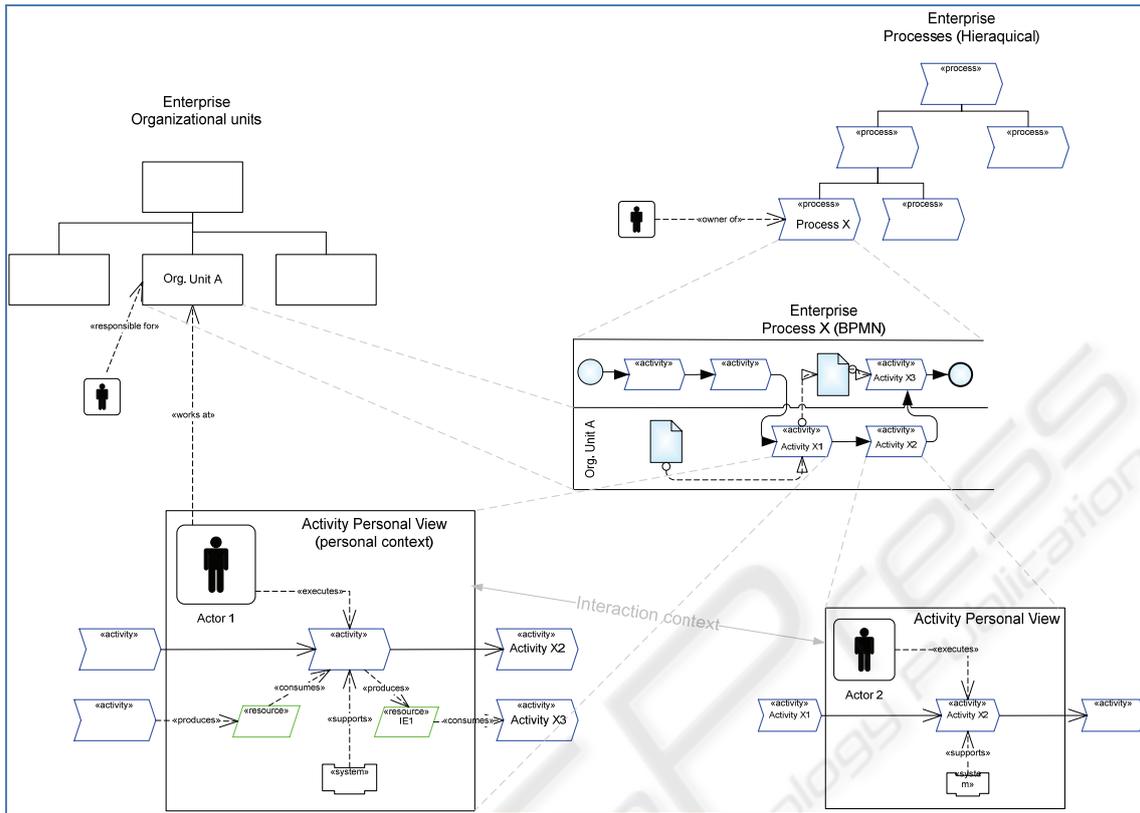


Figure 1: Actors and contexts participating in the as-is model dynamic updating process.

and promoting process continuous improvement (perfective maintenance).

At the individual execution level, the actors have a view, the APV (Activity Personal View) that relates to their work with the entities that they normally handle (which may be informational, material, IS /IT).

In the context of the PROASIS, the annotations can be of three kinds:

- Individual annotation when it is done by an organizational actor in the strict context of a personal activity execution;
- Group annotation when it is done by an organizational actor in the interaction context with other organizational actors. In this case the annotation is proposed by one of the actors involved in the interaction and have to be revised by all other participants of the group;
- Organizational Annotation, sub-divided in:
 - Process annotation, when done by the owner of the process. It may be spontaneous or may be based on one or more annotations made by the performers of activities that compose the process;
 - Functional annotation, when made by an organizational unit responsible, where a

process or part of a process is executed. May be spontaneous or be based on one or more annotations made by the agents included in their organizational unit;

The various contexts where annotation can be applied are summarized in figure 1, where the types of actors (roles) who can participate (executer, group of executers (context interaction), process owner and organizational unit responsible) are identified.

The as-is model dynamic updating process should:

- Define the mechanisms to gather annotations
- Define the workflows needed to capture, analyse, revise and validate the information contained in annotations
- Ensure the integrity relationship between all elements of the architectural model presented in figure 1 to ensure the model consistency and integrity.

3.2 Gathering Annotations

In practice an annotation is considered an individual annotation, if it is done in personal or individual execution context, that is, if it is made on the activity or on the informational entities and/or on supporting information systems that are only used in personal

space of individual execution (Castela, 2008). The simplest case is illustrated in figure 2, where an actor makes an annotation of an activity.

The annotation of an activity (see 1 in figure 2) is by default a individual annotation (annotation made in the individual context of the activity execution), but it can be made to the flow between activities (see 2 in figure 2) that precede or succeed the core activity shown (X1), but in this case it will only be considered as individual annotation if the activity that precedes or succeeds the core activity are also performed by the same actor. If, for example, X2 is an activity performed by another actor and if the actor 1 makes an annotation to the activity flow from X1 to X2, this will be considered a group annotation in the interaction context (see interaction context in figure 1). Similarly, if the annotation is done on an informational entity considered "private" the actor (an informational entity produced and consumed exclusively in the actor personal context of execution), this will be considered a individual annotation, but if the informational entity is produced or consumed by another activity performed by another actor, the annotation will be considered a group annotation (for example, the annotation made to the informational entity IE1, which is consumed by the activity X3 performed by another actor (see interaction context in figure 1). In the context presented in figure 2, the actor 1 can make an annotation on the information system (see 4 in figure 2). This annotation is considered an individual annotation if the system in question is only used in this activity, or may be considered a group annotation if the information system supports other activities in the organization. If an annotation is made on the organizational unit by the responsible of the unit, it is considered a functional annotation. If an annotation is made on the business process level by the owner of the business process, it is considered a process annotation.

3.3 Workflows for Annotation, Revision, Approval and Updating

The PROASIS can be automated through the implementation of a set of workflows defined to ensure the capture, categorization, contextualization, validation, approval and incorporation of annotations in the model, ensuring communication between the various actors involved.

The process has a set of activities that can have several typical flows, as many the types of annotations. Figure 3 shows the example of workflow initiated by the individual annotation gathered in the personal action context.

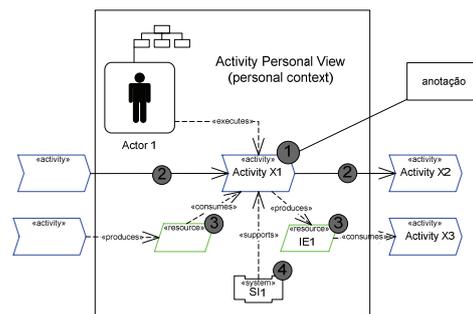


Figure 2: Personal action context.

In this context, the actor sees their activities in organizational model, and can make an annotation to the modelling elements in the individual execution context. To choose the element (modelling) it will be necessary to categorize the annotation and write a comment.

After creating the annotation, which is pegged to the modelling element of the as-is model and to the actor who made it, there will be a verification to discover if there are other actors performing the same activity. If any, they will be notified and receive the original annotation to be reviewed. The review should be indexed to the original annotation, and contains a descriptive text field and a checkbox to agree or disagree with the original annotation. Note that all the actors involved at this stage receive the original annotation, as well all the revisions that are being made, so (and this include the actor who produced the original notation) they can make revisions to add comments to the original annotation, providing a discussion mechanism between various stakeholders at this level.

After some time pre-set, the set formed by the original annotation and the reviews of other actors that perform the same activities in the organization, is "sent" to either the organizational unit responsible and owner of the process (if any), which will have a pre-defined time to conduct the approval of individual annotations. These two organizational actors, after analysing the annotations and the reviews, must approve or reject the goals of the annotations, and may re-categorize the annotation and/or clarify it by inserting additional text.

The consequences of the annotations are incorporated in the enterprise model, only if there was a joint approval from the organizational unit responsible and from the business process owner. The actors engaged in the approval stage could use the approval pre-set time to establish a conversation. If the annotation is not approved by any one of the actors engaged in the approval stage, the annotation is considered nor approved.

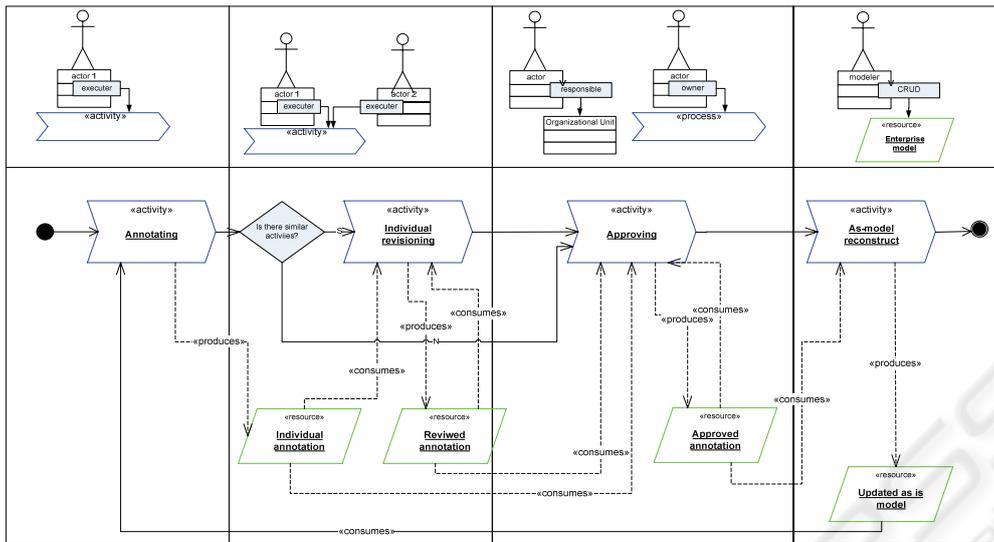


Figure 3: Workflow initiated by individual annotation (the personal action context).

The result of the approval will be distributed to all actors participating in this process (annotation, review, approval) that will be notified by the modeller, so the proposed changes are published by distributing the as-is model updated with the annotation attached to the modelling elements involved. If the annotation is rejected, there are no changes to the model, but the annotation (with the correspondent reviews and approvals) is distributed to all stakeholders involved.

Others workflows are considered, differing mainly by the context where the annotation is made:

- Annotation initiated in the interaction context (group annotation).
- Annotation made in the organizational context (process or functional annotation).

Table 1 presents the organizational roles involved in the process of annotation, review and approval for each of the modelling elements that can be annotated:

Table 1: Organizational participating roles.

Model Elements	Annotation	Revision	Approval
Activities, flows, IE and IS	Executers (E)	E	PO and OUC
Processes	Process owner (PO)	PO and OUC	PO and OUC
Organ. Units	Org. Unit chief (OUC)	PO and OUC	PO and OUC

4 THE MAPA TOOL

To support PROASIS, a tool was developed and named MAPA (Monitoring and Annotation of

Processes and Activities) with the following general requirements:

- Annotations, revisions and validations edition:
 - The actors need support to make annotations in the context where the experience is gained. Thus, a system allowing the creation, modification and deletion of annotations by users must be developed.
- Different levels of granularity:
 - Should be possible to annotate any object in the process model.
- Access rights:
 - To protect the annotations authors, different levels of access rights should be supported to ensure the privacy.
- Mapping annotations to entities:
 - For each annotation is crucial to know to which object it is attached. A mechanism relating annotations and objects should be developed.
- Enterprise model integrity assurance:
 - Even if each view only represents the vision of a part of the organization, it should be possible to represent the whole organization through the aggregation of the several parts, ensuring integrity through the use of a relational database.

The tool developed aims to capture the changes proposed by the actors to the organizational model through the implementation of workflows involving analysis and annotation of the modelling and subsequent annotations review and approval. The main view of the tool (see diagram in figure 4) provide to the activity executers a view to the APV diagrams (Personal View Activity) which aggregate the activity and its context (documents used and

produced, information systems, previous and subsequent activities, annotations, etc.). This view will allow the access to services indexed by the modelling elements (software service and user manuals, helpdesk, etc.) in the needed context, promoting the tool usage.

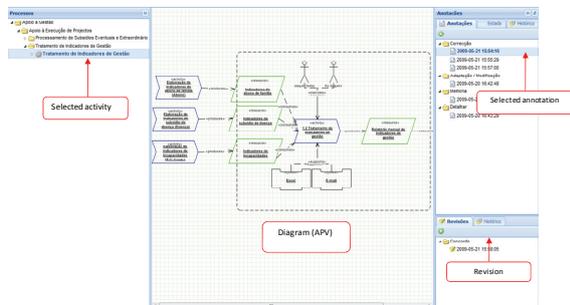


Figure 4: MAPA screenshot.

5 THE CASE STUDY

The purpose of this case study is to apply the MAPA tool to the Social Security District Centre of Castelo Branco (CDSSCB) supporting the as-is enterprise model updating process (PROASIS) through the stakeholders involvement, doing annotations, and then reviewing and approving them in order to update the distributed model. The CDSSCB is part of the Portuguese Institute of Social Security. The tool is already running in the CDSSCB's Centre for Management Support, which is divided in 4 teams: Training, Planning, Infrastructure Support and District Inter-speakers.

The figure 4 shows one Activity Personal View in the case study scope.

6 CONCLUSIONS AND FUTURE WORK

The tool to support the as-is enterprise model dynamic updating is currently being used in a governmental Portuguese organization, where the actors are now making the annotations and reviews. The available results indicate that initially the actors mostly made annotations as corrections to the distributed model, allowing and promoting an opening conversation about the operation procedures by the executors of the activities. The tool is being used also to propose some improvements to the work practices by the activities executors.

The introduction of the tool in a real organization revealed that it could have an important role not only in gathering the information needed to update the

model, but also in opening a communication channel, sharing and gathering knowledge about the activities of the organization.

The tool is being improved to allow the direct edition of the APV diagrams, and to incorporate the modeller area to edit, redesign and distribute the as-is model.

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