Flexibility of Organizational Structures for Flexible Business Processes

Marite Kirikova

Department of Systems Theory and Design
Riga Technical University, 1 Kalku, Riga, LV-1658, Latvia
e-mail: marite@cs.rtu.lv

Abstract. The paper considers two issues of business process flexibility; first, the fit between organizational structure and organizational processes and, second, dynamic job assignment based on dynamic knowledge maps. Organizational structure usually is considered to be more stable than organizational processes. However changes in the processes can cause appearance of emergent organizational structures, which are more effective than formal ones. Business process model analysis is needed to identify when the formal structure is to be replaced by an emergent one. Dynamic knowledge map is changed each time a person performs some new task in the process. This allows to track experience of employees and thus to base job assignments on up-to-date information about their knowledge.

1 Introduction

Flexibility is defined as the ability of the entity to proactively, reactively or inherently embrace change in the timely manner through its components and its relationships with environment [1]. Thus, in the context of business process management, business process flexibility may be achieved through timely changeable constituents of business processes and timely changeable relationships between business process and its environment. This paper focuses on the role of the organizational structure in business process management in general, and on the possibility to model flexible organizational structures in particular. Depending of the viewpoint, organizational structure may be considered a constituent of the business process or a part of business process environment.

The paper shortly discusses two issues of flexibility of organizational structures, namely, (1) analysis of emergent organizational structures, and (2) job assignment on the basis of dynamic knowledge maps. Those issues are chosen for discussion in this paper, because in both cases transparent business process modeling is necessary for achieving flexibility. Capabilities of some business process modeling tools to support these issues of flexibility are touched upon.

The paper is structured as follows. The role of organizational structure in the business process performance is briefly analyzed in Section 2. The aim of this section
is to set background for further discussion. Emergent organizational structures and their impact on the business process flexibility are discussed in Section 3. Knowledge map based job assignment for supporting business process flexibility is discussed in Section 4. Brief conclusions are given in Section 5.

2 Organizational Structure and Business Process

Business process is performed by employees who are parts of formal or informal organizational structures. People may be organized in particular formal organizational units according to power, decision making, functional or other relationships. Formal organizational structures tend to be more stable than business processes because of legal relationships between employees and organization, which define their right to occupy a particular position in the organizational structure. There are several types of organizational structures, such as functional, matrix, network, etc. that are described by different metaphors such as machine, organic, culture, etc. [2]. To achieve high effectiveness of business process performance it is necessary to consider not only formal, but also informal organizational structures, which are formed by informal leadership, friendship or skill (knowledge) based relationships between the employees.

From the point of view of business process modelling, at high level of abstraction, an organizational structure may be viewed in two ways: (1) as a part of a business process, i.e., it may be included in the business process as one of the attributes (Fig. 1a) or (2) as the environment of the business process (Fig. 1b). At lower levels of abstraction only parts of organisational structure may be considered as parts of business sub-processes (Fig. 2). Thus, formally, in a flexible business process, organisational structure and relationship Performs between business process and organisational structure (Fig. 1 b) have to embrace timely change when it is requested by changes in the business process. Therefore a possibility to reflect views a and b (Fig. 1) on organisational structure is a desirable characteristic of the business process modelling tool. Different business process modelling tools use different approaches to reflect organisational structure and relationship Performs between business process and organisational structure [3]. The approach implemented in the tool may be characterised by the conceptualisation capability of the tool. We can distinguish between (1) manual conceptualisation capability, and (2) automatic conceptualisation capability. Manual conceptualisation capability means that there is a possibility to find relationships between business process elements and related organisational structure as a whole. Automatic conceptualisation means that by clicking on a particular performer of the business process (task) in the business process model the user navigates to the organisational substructure where the particular performer is represented as an object and highlighted among other objects included in this model (see Fig 2).

Advanced business modeling environments, such as Casewise, ARIS, GRADE and ADONIS provide automatic conceptualisation capability [4, 5, 6, 7].
Fig. 1. Two views on the organizational structure: a) organisational structure as a part of the business process; b) organizational structure as an environment of the business process

Fig. 2. Elements of organizational structure as business sub-process (task) elements

Since the time of functional, mechanistic organizations it is common to view organizational structure as a more stable component than the organizational process. Many business process modeling tools are built with this assumption implied. This means that, in case the performers of the process are shown in the graphical
representation of the process, first performers are defined and then processes are assigned to them. However in contemporary turbulent environment not always the performers of the process are known in advance. Therefore it is important to have a possibility to model process first and then assign performers. The result of the modeling is the same as in the previous case, but the process of obtaining the model requires different sequence of steps in knowledge development about business processes and different modeling capabilities of the tool. There are several tools that permit the organizational structure independent process modeling and still have a capability to reflect performers in the model. ARIS and GRADE are two examples of such tools [5, 6]. This capability of the tool is essential, when flexible organizational structures are needed for performance of tasks in rapidly changing environment.

Traditionally formal organizational structures are represented using business process modeling tools. However informal structure may be modeled as well. The reason, why it is rarely considered in business process models is rather the difficulty to identify informal structures than the impossibility to reflect them by the tool. It is worthwhile to mention that there are also semi-formal organizational structures, such as communities of practices or knowledge networks [8], which are easier to identify and represent in models.

So far we have assumed that there are two independent models, namely, the business process model and the model of organizational structure. Models depend on one another by Performs relationship. But, if the tool permits organizational structure independent business process modeling, it is possible to derive an emergent organizational structure from the business process model.

3 Emergent Organizational Structures

Emergent organizational structure is derived from the sequence of tasks in the business process. Fig. 3 presents the emergent organizational structure for the process given in Fig. 2.

![Fig. 3. Emergent organizational structure (dotted lines)]
The emergent structure is depicted by a dotted line. Performer 1 after completing Task 1 together with another member of Unit 1 makes decision, then, in case of Decision 2, Performer 2 accomplishes Tasks 6 and 3. Afterwards Task 4 is performed either by Performer 3 or Performer 5. The dotted line shows that the intensity of relationships between Performer 1 and Performer 2 is three times higher than the intensity of relationships between Performer 2 and Performer 3 and Performer 5. We can assume that those performers, who communicate more intensively during the business process should form a particular subunit in the organizational structure. For example, if it would appear that Performer 1 communicates more intensively with performer 5 than with Performer 2, the performer 5 could be included in Unit 1. Fig. 2 shows that current formal organizational structure reflected in Fig. 2 does not contradict to the emergent organizational structure.

When business process changes, the emergent structure may gradually become considerably different in comparison with the formal organizational structure. This could suggest structural changes in the organization to achieve or to re-establish a good fit between organizational process and organizational structure.

At present none of the business process modeling tools, known by the author, fully support generation and analysis of emergent organizational structures. Nevertheless, some possibilities are provided, e.g., by tool GRADE, which allows to generate information flows between organizational units (performers) of the processes on the basis of a business process diagram and analyze intensity of relationships between performers on the basis of simulation results.

4 Knowledge Maps Based Flexibility

The main reason why a particular employee is assigned to a particular task in the business process is his/her current or potential ability to perform the task. In most cases this ability is rooted in the person’s knowledge. In a very small organization everyone can be aware of the knowledge each employee possesses. In larger organizations such tools as knowledge maps (or yellow pages) may be applied for representing the knowledge possessed by employees to fasten the job assignment procedure. Therefore it is important that the tool used for business modeling has automatic conceptualization capability to relate elements of organizational structure to the knowledge maps, as well as to relate knowledge maps to the business process. Actually, part of the knowledge map may be derived from the business process, by generating relationship Knows about from the relationship Performs. In this way knowledge map may serve as a reference for job assignments when the process changes.

The example given in Fig. 4 shows that Knowledge 1 (denoted by K1 in the knowledge map) is needed to perform Task 1 and Knowledge 2 (denoted by K2 in the knowledge map) is needed to perform Task 2. Knowing this, and taking into consideration the relationship between elements of the organizational structure and knowledge map, the Task 1 may be assigned to Performer 2 or Performer 4, but Task 2 to Performer 5.
Once the performers are assigned to the tasks and actually perform them, the knowledge map may be updated regarding new competences of the performers (Fig. 5): competence T1 can be related to the performer of Task 1 and competence T2 can be related to the performer of Task 2. This means that particular employees have experience, not only knowledge regarding particular business tasks.

Availability of above mentioned models facilitates decision making regards empowering people with new knowledge and gap analysis of the current state against the ideal state of their knowledge [9]. It gives an opportunity to consider employees’ knowledge and skills at different knowledge levels and dynamically update these skills on the basis of actual tasks of performers. At present none of the business process modeling tools, known by the author, fully support both (1) job assignment via knowledge maps and (2) knowledge map update. During simulation some tools support automatic assignment of the performer if a the competency needed for task performance is known [6]. For tools, which provide relatively simple extension possibilities [4], a knowledge map may be implemented as an additional model. However dynamic update of knowledge maps requires support of an executable business process system.
5 Conclusions

It is well known that a rigid organizational structure hinders changes in business processes. Nevertheless, most of business process modeling tools do not provide special support for modeling flexible organizational structures [3]. However most of advanced tools have automatic 3D conceptualization capabilities (navigation between business process model and organizational structure and data/information structures). This suggests that, at least theoretically, it would be possible to extend these tools with modules for modeling emergent organizational structures as well as with modules for dynamic knowledge map based job assignment.

References