Business Process Support - from Initial Analysis to Introduction into Operational Practice (Obstacles to Overcome)

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Abstract. There is an important difference between a traditional business application and a business process support (BPS) system. A traditional business application is aimed at supporting the old way of doing business but more effectively. A BPS system can be considered as a tool of introducing a new way of organizing work. Moreover, this way is often impossible to introduce without a support system. This difference affects all stages of system development, from initial analysis to introduction into the operational practice. For example, what are the best ways to discuss with domain expert a new way of organizing business before you have any system? In what way the user can recognize in the system the requirements created during the analysis phase? How much of the system should be initially introduced in operational practice so that the user can get a "feeling" of the new way of organizing business and accept it? A list of these, and other questions are being put forward for brainstorming.

1 Motivation

The aim of this paper is to serve as a starting point for brainstorming problems of Requirements Engineering (RE) for Business Process Support (BPS) systems. Though the main topic of the workshop is RE, we need to consider a broader context in order to understand the specific features of RE for BPS, and in what way it may differ from RE for traditional business applications. We start with a number of hypotheses about BPS systems and consider the consequences from these hypotheses on the whole process of developing a BPS system and introducing it in operational practice. The hypotheses themselves are only hypotheses. They can be subjected to sharp critique, new hypotheses could be put forward, and the consequences of new hypothesis could be discussed.

2 Hypotheses

Hypothesis 1. Process-oriented organization of work is better than a traditional functional or project-oriented organization, especially in the global economy with its

worldwide competition. We will not give any argument here in defense of the hypothesis, but there are a lot of published works that do this, starting with classical [1].

Hypothesis 2. Business processes exist in any company or organization. These processes are rarely documented in full. Even if they are documented, there is no guarantee that the processes follow this documentation in detail. The work is done according to some historically emerged practice supported by oral tradition.

Hypothesis 3. Today, the majority of companies and organizations do not work in a process-oriented way. While some companies and organizations work in a project form, functional structures prevail.

Hypothesis 4. Many business processes are of cross-department nature. Full-fledged process-orientation means changing the way of working for everybody, not just for a small group of workers.

Hypothesis 5. Having a BPS system in place is a prerequisite for introduction of a process-oriented way of running business. A lot has been written about how to introduce process-orientation. Steps that are recommended include (a) reengineering of existing processes, (b) introduction of process management (constant adjustment of process definitions), (c) changing the organizational structure, e.g. creating positions of process owners. However, any of these steps won't help us unless we can ensure that the processes are run according to their definitions. There is no sense in reengineering a process if we cannot ensure that the new design will be followed in practice. Therefore, some means of process control needs to be introduced. For many type of business processes, this means are a software system, i.e. a BPS system. An effort to introduce process-orientation without a BPS system can be compared to introduction of the conveyor production method without having a conveyor belt.

3 Consequences

One of the main consequences of the hypotheses above is as follows. *Currently, more often than not, the development and introduction of a BPS system is a part of more complex project of process-orientation of an enterprise.* The system should be considered as a main tool for organizational change. Additionally, the success of the whole project very much depends on the majority of the workers accepting the new way of doing business supported by the system. Just having a proper system is not enough.

The consequences above does not exclude the needs of the usual steps recommended for creating a BPS system, like process identification, building process models, process reengineering. However, the consequences of the hypotheses listed in section 2 may have influence on how these and other steps are being conducted.

3.1 Business process modeling

Consider the step of *building process models*. If we accept the second hypothesis, the only acceptable way of getting information on the processes is gathering it from the people participating in these processes. And this means all participants, not just

managers who might not know real details. The other possible way of direct observation might be quite tricky and expensive. It might work with large corporations that are able to spend a lot of money for such a project, but this method won't work with small enterprises.

In many cases, process participants are non-technicians, which should be considered when choosing a modeling technique and language for documenting the model. Firstly, the language should be understandable for these people, otherwise they can't confirm the model validness. Secondly, they should be able to recognize this model in a system build upon it. Otherwise, it will be difficult to get system acceptance. Thus the first question for the modeling phase is what kind of modeling techniques satisfy this requirement.

Another question is the level of details that should be put in the model and then supported by the system. Quite often, we do not have reliable sources of information on the details, and/or we do not have enough resources (money and time) to investigate all details. In addition, too many details can make the system introduction too complicated, thus putting at risk the whole project. In addition, details are often connected to the today's way of handling the processes. These details can be wrong when the process is supported by the system. What level of details is optimum? What is the minimum level of details that should be investigated? What is the minimum level of details that should be supported by the system so that its introduction still makes sense?

3.2 Business process reengineering

It is often suggested that the process should be reengineered before it is explicitly introduced with the help of a BPS system. The question is how much? On one hand, we can start with analysis of the enterprise objectives, getting down to what business processes we need to reach these objectives, and defining the optimal way of running these processes. On the other hand, we can make the system to support the current process as it is. Both extremes have their own drawbacks.

If we completely redesign business processes, the task of introducing process-orientation can become too complicated. In addition to changing the way of doing things, the things being done are also changed. This may confuse the workers and put the whole project at risk. In addition, without a system in place, there might not be enough statistical information to create an optimal definition of processes. The new design might have a hypothetical nature, which will require new round of redesign as soon as the system is in place and some statistical information has been gathered.

Literarily following the old process might not be a good option either. As was mentioned in the previous section, many steps in the old process are connected to the technology available. Including them in the supported process might create frustration among the participants. Suppose, for example, that the old process had a step of copying an incoming document and sending the copies to a predefined list of people. Including the step in the supported process would look ridiculous, another means should be used to (a) making these people to pay attention to the fact of receiving a new document, and (b) giving them easy access to its content.

A business process definition is not only about what is being done, but also about who is doing what, i.e. about the organizational structure. The deliberation above concerns this part of the definition as well. Changes in the responsibilities might be necessary, but total reorganization might put the project at risk.

3.3 System development

One of the main consequences of the hypotheses from section 2 is that a BPS system should be put in operational practice before the full and detailed analysis has been completed. Moreover, introducing the system in operational practice is the only way to complete the analysis. Therefore, evolutionary way of system development here is a must, not just an option.

After the system has been installed almost "daily" changes might be required. This put forward two questions:

- What modeling technique can help to cope with this kind of changes?
- What kind of application development tools are needed?

As far as kind of changes are concerned, beside usual changes in how the things are done, and how the BPS system is integrated with other systems, the following two kinds of changes are of a particular interest:

- Changes in order of activities flow, like from *delivery first invoice after* to *invoice first delivery afte*. Moreover in an initial introduction, all sequences might be allowed, while more specific order is introduced later.
- Responsibility between what is done by the system and what is done by the users are subjected to changes: some functions meant for the computer may be handed back to the user. And vice versa, some functions meant for the human being may be handed to the computer (see more discussion on this issue in [2]).

If the modeling technique is based on the fixed order and fixed distribution of responsibilities, e.g. Use Cases, changes in the order or/and distribution of responsibilities will require essential changes in the model. Dependent on how much the model is connected to system design, this in its own turn may result in essential changes in code. We need modeling techniques that leave the essential part of the model intact when such changes are introduced. Which ones?

The ideas of what development tools should be used for system development are often dictated by current fashion. Right now, we are in the period of low-level programming, e.g. in Java. In late eighties and beginning of ninetieths, 4th GL tools were popular. Coping with changes when the system is coded in a low-level programming language can be difficult, and not affordable for smaller corporations. 4th GL of the past are not conceptually suitable for process support. What kind of application development tools do we need? On what principles should they be built? At one time, Workflow Management Systems were considered to be appropriate for the task, however they showed a degree of inflexibility. Could it be fixed?

3.4 Responsibilities for project success

As was mentioned before, introduction of a BPS system in practice goes hand in hand with introduction of a process-oriented way of working in a functionally structured organization. It is quite normal that the management, even when it is supporting the idea, does not have experience and full understanding of process-orientation. Therefore they might need help in introduction of organizational changes. Without such help the project might fail even with the best possible BPS system.

The Business Analysts (BA), or Requirements Engineers (RE), or whatever we call them, who created the initial model and did reengineering, have the best knowledge on the business processes as they were and as they should be. It would be quite natural, for them to explain the ideas to all process participants and help them not only to handle the system technically, but also to use it properly in their everyday work. Therefore, the responsibilities of BA, and RE should be extended so that they become a bit of Management Consultants. Are today's BA, and RE specialists prepared to assume this role? What kind of education and background is most appropriate for BA, RE in connection to BPS systems development?

4. Conclusion

In the previous sections we listed some problems and questions connected to BPS projects. The list can be extended with many others. Ian Alexander in [3] asked the question: "Is there anything special with Requirements Engineering for BPS?" His implicit answer is that there is nothing special. In a way it is true, and in a way it is not. All general theoretical and practical recommendations about RE and system development applies to BPS as well as to any other system development. However:

- These recommendations are quite rarely followed in practice, that's why many software projects fail. The complexity of a project of BPS introduction will make it even more difficult to succeed if we do not follow the best theoretical and practical recommendations. Even with a good software system, the project can easily fail.
- High-level theoretical recommendations, on their own, cannot help a particular project to succeed. We need practical recommendations, methodologies and tools to succeed in each particular area of system development. The objective of this paper, and the workshop on the whole is to prove that there are a number of problems that are specific for BPS development, and to discuss possible solutions to these problems.

References

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