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Development of a decision-making strategy to improve the efficiency of BPR

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Abstract

To support the efficient appraisal of and selection from a list of generic business process improvement principles, this paper proposes a strategy for the implementation of business process redesign (BPR). Its backbone is formed by the analytic hierarchy process (AHP) multicriteria method and our earlier research into the popularity and impact of a set of redesign "best practices". Using AHP, we derive a classification of most suitable directions for a particular process to be redesigned. Criteria such as the popularity, the impact, the goals and the risks of BPR implementation are taken into account. A case study is included to demonstrate the method's feasibility and effectiveness.

Keywords: Business process redesign; AHP; Multi-criteria; Decision-making; Best practices

1. Introduction

One of the highlights in a large survey among senior business managers is that business process redesign (BPR) is almost as popular again as it was in the beginning of the 1990s (Rigby & Bilodeau, 2005). Despite the continued interest in this approach to rethink existing process structures considering the opportunities that IT provides, few analytical tools exist to support the actual redesign of a business process (Nissen, 1988). The aim of the work as presented in this paper is to develop a tool that supports the decision-making process practitioners apply to come up with a new, improved plan for a business process.

This aim links up with a more general observation that BPR often does not lead to the desired results, because it is a time-consuming and costly affair with unpredictable results. It has been argued that there is a clear need to improve the redesign process itself (Hofacker & Vetschera, 2001; Nissen, 1988; Reijers, 2003). The goal of the decision-making tool that is described in this paper is to:

(i) increase *the efficiency* of the redesign process itself, and
(ii) to lead to a *more systematic evaluation* of improvement opportunities.

In earlier work (Limam Mansar & Reijers, 2005, 2007; Reijers & Limam Mansar, 2005), we published on our efforts to attain the second goal through the identification, validation, and practical use of a set of so-called "best practices". In this context, a best practice is a general heuristic derived from earlier successful encounters to improve process performance, which may need skilful adaptation to be applied in a concrete setting. For example, instead of using a paper file which favors processing in a sequential way (i.e. the physical document is passed from one executor to the other), the use of an electronic file may be con-

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sidered to speed up the work, as people can work *concurrently* on their own electronic copies.

The proposed set of best practices may be used to structure the redesign sessions with business professionals, as we did, for example, for the redesign of an intake procedure in a mental health-care setting (Jansen-Vullers & Reijers, 2006). Each best practice was considered by all participants on its applicability and subsequently subjected to a more thorough performance evaluation by simulating the process models. But even though this structured approach improves upon the often intuitive way that BPR is carried out, it remains problematic in the sense that such an approach requires considerable time and efforts from all participants to carry out the project.

The described tool in this paper still fosters the *systematic* breadth of considering a set of redesign best practices, but it also addresses the efficiency of the BPR process by *efficiently* classifying a set of most appropriate best practices for a specific case. Such a result may serve as a "kick-start" for the redesign team involved, speeding up the redesign process.

There have been other contributions in this field where mainly artificial intelligence algorithms have been used. Case-based reasoning and inference rules are examples of such approaches (see e.g. Min, Kim, Kim, Min, & Ku, 1996). However, the majority of these contributions require the gathering of a large set of successful cases or address only specific processes for a given industrial or service sector. An exception is the work of Nissen (Nissen, 1988) that aims to detect weaknesses in a given process design by using various metrics and dedicated algorithms. Although the aim of this work is comparable to ours, the approach is completely different, as will be discussed in our related work section (see Section 7).

In the remainder of this paper, Section 2 will give the necessary background for this paper in the form of an overview of our earlier work. Section 3 gives a high-level description and contribution of our tool and specifically how it may help to improve upon common design practice. Section 4 deals with introducing the different aspects or criteria that should be taken into account when deciding which best practice should be implemented in a concrete situation. Section 5 introduces AHP as the multicriteria decision-making method chosen for this study and builds up the strategy for the implementation of BPR using AHP. Section 6 applies our findings to the case study of a Dutch municipality. Section 7 is a review of related work. Finally, Section 8 provides our conclusions and future work.

2. Background

In total, we earlier identified 29 best practices (Refer to Table 2) that are widely applied by practitioners and found (partial) support in the literature to improve the performance of existing processes (Reijers & Limam Mansar, 2005). To search for improvement opportunities in an *existing* process and to *locally* apply one or more best practices is clearly different from the original reengineering idea, which is to get rid of current work practice and start thinking out the business process all over again (Hammer & Champy, 1993). However, the latter "clean slate" approach has repeatedly proven to be impractical in reality (Al-Mashari, Irani, & Zairi, 2001; Davenport & Stoddard, 1994; Sockalingam & Doswell, 1996), which explains the focus of our work. In the same paper in which we published our set of best practices (Reijers & Limam Mansar, 2005), we also discussed the qualitative impact of each best practice on four important performance indicators of the redesigned processes: its time, quality, cost and flexibility.

If a process were to be redesigned using this set of best practices, all 29 of them would need to be carefully scrutinized to assess their applicability to the process at hand. It is clearly a lengthy procedure that will require many meetings involving various stakeholders. We already aimed to limit this effort by listing and classifying the best practices into a framework (Limam Mansar & Reijers, 2005). The idea behind a framework is to help practitioners by identifying the components that should be considered and how these components are related. Our framework included eight components, namely, the customer's perspective of the process, the information handled, the product delivered by the process, the operation, behavior and organization views of the process, the technology that supports the process and finally the external environment.

In the same paper (Limam Mansar & Reijers, 2005), we published on the exposure of the best practices and the framework to experienced BPR practitioners in both the Netherlands and the United Kingdom. To establish their practical use and impact, a survey was undertaken in the years 2003–2004. In that survey, we asked the experts' help to validate our framework and to classify the ten most popular best practices; this in an effort to highlight the most relevant ones.

In Limam Mansar and Reijers (2007) we continued our survey analysis discussing the feedback received from the experts on the practical impact of the various best practices in terms of cost, time, quality, and flexibility improvement. It is important to note that the latter discussion was conducted on the top ten best practices only (as it would have been too long to include them all in the survey).

So far, we applied the set of best practices to improve existing business processes in various settings, such as a mental health-care institute, a medium-sized mortgage lender, a Dutch ministry, and a large multi-national bank (Jansen-Vullers & Reijers, 2006; Limam Mansar & Reijers, 2005; Reijers, 2003). This paper includes the case of a local municipality where the set of best practices was applied to redesign their invoice handling process (see Section 6).

These accumulated experiences, stressed even further the importance of making the BPR process itself more efficient. They also delivered many of the insights that were required to develop the tool, of which the specifics will be given in the following sections.