Repeated Use of Process Models: The Impact of Artifact, Technological and Individual Factors (Extended Abstract)

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Abstract: Business process modeling has received a lot of attention from practitioners and researchers alike. Organizations make significant investments into process modeling in terms of training, tools and resources. Yet, having invested into creating large process model collections, process models often fall into disuse, provoking the impression that the initial investment has been lost. In this paper we present a summary of a study on factors that facilitate or hinder the repeated use of process models by individual users. Results from that study indicate the importance of quality and ease of understanding of process models to repeated use, alongside individual factors, such as motivation and individual expertise. We also identified means that support organizations in promoting repeated process model use. The work summarized in this extended abstract has been published in [No16].

Keywords: Process Modeling, Repeated Use, Value of Process Modeling, Intentions for Repeated Use, Survey

1   Introduction

In this paper we present summarized results from a study on factors that influence an individuals´ intention to repeatedly use process models and on means to foster repeated use. These results were reported in an article for the Decision Support Systems journal in June 2016. This paper provides a short overview of the approach as well as the results. For a full account of the research we would like to encourage the reader to refer to the respective journal paper [No16].

Studying factors that influence an individuals´ intention to repeatedly use process models is of relevance for research and practice alike since many organizations commit ongoing investments in creating large process model collections [Ra06]. Afterwards organizations are oftentimes faced with the problem that models fall into disuse which means that investments taken to create them are at the risk of being lost. Repeated use has been identified as a key challenge in order for process modeling to be beneficial [In09]. We subsequently conducted a study aiming at identifying antecedents of individual repeated use behavior.

There is a substantial body of literature that focusses on technical aspects of process

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model re-use. In this field however re-use is understood as applying some fragments of a model or an entire existing model [Ko14] in the creation of a new or revised model. Discussions include, for instance, various types of re-use patterns [Th08]. Behavioral aspects of repeated process model use however have not been studies so far. In particular, questions of when and why a particular act of repeated model use is happening remain unanswered.

In order to close this gap we first developed a theoretical model of factors that might impact and individuals´ intention to repeatedly use a process model (section 2). Based on this model we created a questionnaire using established measures from literature, conducted a pretest and ran a study in one large representative organization (section 3). Results from this research are reported in section 4.

2   Theoretical model and background

We started our conceptualization by first defining our phenomenon of interest – repeated process models use – as *"the extent to which a process model is employed again by an individual user to perform a task"* [No13]. Repeated use in this context thus describes a knowledge seeking behavior rather an actual modeling task.

Based on this conceptualization we conducted an analysis of existing literature in order to identify factors that could potentially promote or hinder an individual´s intention to repeatedly use a process model. Due to the lack of empirical research on repeated process model use we extended our review to information artifacts and information seeking behavior. This included literature on knowledge re-use as well as more technologically centered scenarios such as software re-use, code re-use and database query re-use. We also considered literature concerned with factors that influence re-purchase intentions which have extensively been studied in the field of marketing. In total we identified the following groups of factors to have a direct positive effect on an individuals´ intention to repeatedly use a process model:

- **Artifact factors:** Repeated use will depend on the properties of the process model that is being repeatedly used. These properties include the fit of the process model to a task the user is aiming at repeatedly using it for, a users´ perception about the quality of the process model, her perception of the usefulness of a process model, her perception about how easy it is for her to interpret this process model and finally her previous satisfaction when using process models.

- **Individual factors:** We perceive repeated process model use as an individual knowledge seeking behavior and it is thus reasonable to include individual factors in our analysis. These factors include an individuals´ motivation as well as her modeling expertise. The latter is relevant for this context since extracting information from models requires the ability to read and understand them.

- **Technological factors:** Organizations usually have software tools in place in which models are stored and through which they are accessed. We thus included technological factors such as the perceived usefulness of a software, its perceived ease of use and the overall accessibility of process models into our analysis.

3 Study

In order to study the impact of the aforementioned factors on an individuals´ intention to repeatedly use a process model, we conducted a cross-sectional survey in one large representative organization. We selected a particular large European bank since process models are an important aspect of their work and using process models is a well-established practice there. That organization has a repository containing thousands of process models. We invited 406 people to participate and received 121 completed and 107 incomplete responses, which we excluded from further analysis.

For the survey we relied on established measures for each of the aforementioned factors and included questions that would allow us to gain a deeper understanding about the organizational context as well as the individual itself. These questions covered age and gender of a person as well as measures of the time an individual has been a member of the organization and which organizational unit the person belongs to. We also included questions about the purpose for which an individual generally uses process models during her work and we developed a scale aiming at identifying intentions for repeated use based on the definition described in the previous section (c.f. section 2). Finally, we included open ended questions which focused on the organizational context as well as on ideas of people on how to improve process models and process model access. The full questionnaire can be found in the appendix of our DSS paper [No16].

4 Analysis and results

After data cleansing which included removing inappropriate responses as well as responses by participants that had not used process models before we ended up at 86 usable data points for our analysis. We conducted a quantitative analysis starting with descriptive statistics and simple correlations before conducting a structural model estimation using PLS as well as a supplementary qualitative analysis. Due to page limitations we will only report on the most significant findings here.

The structural model analysis revealed the following factors to have a direct and positive effect on repeated process models use, in descending order of importance:

- The **perceived ease of use** of a process model,
- the **perceived usefulness** of a process model,

- the **accessibility** of a process model and

- the **motivation** of an individual.

The analysis also revealed that satisfaction has no direct effect on repeated use intentions despite being influences by the same factors that influence intentions for repeated use. Furthermore, satisfaction was also influenced by the perceived semantic quality of a process model.

These findings were supported by our subsequent qualitative analysis since most participants stated that models should be *"short and simple but with enough details to understand them"*. The qualitative analysis also revealed that models are mainly used repeatedly to gain or regain knowledge about a process the respective participant is involved in. We also found enquiries by external stakeholders such as people from other departments and external partners to be a reason for repeated process model use. We could however not identify a fit between the original task a model was developed for and the task it was subsequently repeatedly used for to be a promoting factors for repeated process model use.

Finally, we also analyzed suggestions by participants on how to improve the repeated use of process models. There we found that most participants perceived models to be useless due to a number of different reasons such as a lack of appreciation for people who use models and devote time to keeping them up to date. Other reasons for this perception were the perception of models to be outdated and the perception that only a subset of existing processes are documented. In order to overcome this perception, some participants suggested that management support could increase the significance of process model use. Suggestion into that direction ranged from providing resources to use process models to expert support for people that are not capable of understanding process models on their own. Participants also mentioned that process models sometimes were hard to find in the corporate process model repository and subsequently suggested to invest in better search functionality.

5   Conclusion

Based on the aforementioned analysis we subsequently arrived at the conclusion that properties of the artifact as well as an individuals´ motivation and the accessibility of process models are the main factors influencing and individuals´ intention to repeatedly use a process model. The main influencing factors on individual intentions to repeatedly use process models however are the perceived ease of interpretation and the perceived usefulness of a process model. The perceived semantic quality of a process model did not influence intentions for repeated process model use which leads us to the conclusion that companies should focus on creating models that are easy to understand rather than overly complex. In order to foster repeated use, companies should also give their employees more time to use process models and provide them with means to easily access and explore them.

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