Capturing and Annotating Processes using a Collaborative Platform

Tobias Weller
Institute AIFB, KIT
Englerstr. 11
D-76131 Karlsruhe
tobias.weller@kit.edu

Maria Maleshkova
Institute AIFB, KIT
Englerstr. 11
D-76131 Karlsruhe
maria.maleshkova@kit.edu

ABSTRACT
Existing standards in capturing processes concentrate on client tools. Furthermore, semantic information are often available that cannot be captured in a structured way with the proposed standard formats. In addition, processes are usually used and maintained by multiple persons. Therefore, a collaborative platform to discuss and share information about processes is valuable.

In order to address the challenge of maintaining and sharing knowledge about processes, we provide a tool to capture and annotate processes using Semantic MediaWiki as a collaborative platform. We demonstrate the practical applicability of our tool by presenting a demo available in the World Wide Web.

Keywords
Business Process Model and Notation; Semantic MediaWiki; Semantic Data Management

1. INTRODUCTION
The World Wide Web has significantly evolved during the past 25 years, developing from a collection of a few interlinked static pages to a global ubiquitous platform for sharing, searching and browsing dynamic and customizable content, in a variety of different media formats. Future developments bring the promise of a higher level of automation, distributed search and the use of intelligent personal agents\(^1\), which autonomously perform tasks on behalf of the user. The foundation for these trends is laid by the ever growing number of users and web sites, the increasing data volumes and the development of the employed technologies, including, for instance, semantics, Linked Data principles and Web APIs.


2. MOTIVATION
There are already tools available that supports capturing BPMN processes like e.g. Signavio\(^2\), Aris\(^3\) and BPMN Corner\(^4\). However, these are client tools that do not support the collaborative capturing of processes.

A collaborative design of processes allows a various number of users to share, discuss and refine processes in an enhanced way. In order to support this basic principle we need a common network structure so that users from different workstations can access and maintain the knowledge. Furthermore, we need a collaborative platform, which can be accessed by using the common network structure, allowing the user to enter and maintain the knowledge. The platform has to support a large number of users in order to ensure scalability. Further functionality of the collaborative plat-
form like e.g. user rights management, embedding of files and proposing statistics is desirable.

3. SEMANTIC BPMN

We developed an extension for Semantic MediaWiki\(^5\) that supports the creation, importing, exporting and annotating of BPMN processes by using an intuitive graphical user interface. Semantic MediaWiki is a collaborative platform to capture and share knowledge in a structured way. Therefore, it is also suitable to capture process data. Furthermore, Semantic MediaWiki provides additional functionality like user rights management and uploading and linking files. Figure 1 shows a high-level architecture of the system.

![Figure 1: The infrastructure of the system is based on a three client architecture. Presentation tier – Graphical representation of the BPMN processes that supports users in creating, importing, exporting and updating BPMN processes and meta-information, Logic Tier – Business logic that converts the inputs in Semantic MediaWiki syntax and communicates with the MediaWiki API in order to store and receive information from the knowledge base, Data tier – Stored data in the Semantic MediaWiki.](image)

The extension, called Semantic BPMN, is based on bpmn.io\(^6\), which is a JavaScript renderer that allows to model BPMN processes and checks the syntax. It is part of Camunda BPM\(^7\), which is an open source platform for workflows. This JavaScript serves as user interface to model BPMN processes. We extended bpmn.io with further functionality in order to manipulate the wiki pages of the elements by using the MediaWiki API. Each BPMN element (nodes and edges) is represented by its own wiki page that stores all information about the element in a structured way. Each manipulation of the BPMN process in the graphical user interface leads to a communication with the MediaWiki API in order to create, update or delete the wiki page of the elements.

However, changing the content of the wiki page (e.g. the position or size of an element) effects the graphical representation of the BPMN process as well. Thus the communication works in both directions.

The formats for importing and exporting follows proposed standards. Thus, the BPMN process can be exported in BPMN 2.0 XML format, as well as in SVG format, which is an image format. The tool requests BPMN 2.0 XML files in order to import BPMN processes.

Additionally, we use Semantic Forms\(^8\) to facilitate the input of meta-information. Users can create individual forms in order to enter meta-information about BPMN elements in a simplified way. Each element of the BPMN process can thus be annotated by a simple selection and click on a form. However, entering the information directly on the wiki page is possible as well.

Semantic MediaWiki allows to export all information in Resource Description Framework (RDF)\(^9\). Therefore, advantage of using Semantic MediaWiki as platform is to provide the possibility to export the captured and annotated processes in a structured way to a large number of people. The information, stored in this format, can easily be processed and queried.

We embedded the extension in a Semantic MediaWiki for demo purposes.

http://aifb-ls3-vm2.aifb.kit.edu/DevelopersDay

Additional to the demo, documentation on how the extension is used can be found on this site. Please use the following login:

Username: Demo
Password: developersday2016

4. CONCLUSION

We showed an extension to Semantic MediaWiki that allows to capture and annotate BPMN processes. The graphical user interface allows users to easily create, import, export and manipulate BPMN processes and enrich the elements with meta-information. The used formats for importing and exporting BPMN processes follow proposed standards. The input of meta-information is facilitated by using Semantic Forms.

Using a collaborative platform in order to maintain BPMN process and share knowledge about them is an innovative approach. The World Wide Web serves as a scalable network to allow the communication between people. Semantic MediaWiki serves as the collaborative platform to structure the knowledge about BPMN processes. We use existing standards and software to enable this innovative approach.

Captured processes and meta-information about these processes are made available to a large number of people by using Semantic MediaWiki as collaborative platform in combination with the World Wide Web. The information is available in a structured format and can easily be adapted. Therefore, a large number of people can use and benefit from these information. Following standards allow to reuse already modeled BPMN processes.

Data security policies can be ensured by using functionalities offered by Semantic MediaWiki. User rights management allows to restrict information to a limited number of users. This makes the preservation from unauthorized access possible.

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\(^5\)http://semantic-mediawiki.org, visited 8 January 2016
\(^6\)http://bpmn.io, visited 8 January 2016
\(^7\)https://camunda.org, visited 8 January 2016
\(^9\)http://www.w3.org/RDF, visited 8 January 2016