Oryx – An Open Modeling Platform for the BPM Community

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1 Introduction

In the academic business process management community, tooling plays an increasingly important role [8,6]. There are good reasons for this fact. Firstly, theoretical concepts benefit from exploration using prototypical implementation of the concepts. By experimentation based on real-world business processes, concepts can be evaluated and refined. Secondly, the practical applicability of the research work can be demonstrated, which is important to raise awareness of academic BPM research to practitioners.

In academic research groups, researchers tend to implement small-scale prototypes that can do exactly what the particular researcher is interested in. Typically each project is started from scratch. If results from collaborators are re-used, then re-use is done in a non-structured way, by copying and pasting program code. As a result, the wheel is re-invented many times, and valuable resources are wasted. Motivated by this observation, the business process technology research group at HPI has decided to develop an open and extensible framework for business process management, called Oryx (`http://oryx-editor.org`).

Oryx supports web based modeling of business processes using standard Firefox web browsers, so that no additional software installation at the client side is required. Users log on to the Oryx web site and authenticate by openID, an internet authentication standard. They start modeling processes, share them with collaborators, or make them available to the public.

More technically, in Oryx each model artefact is identified by a URL, so that models can be shared by passing references, rather than by exchanging model documents in email attachments. Since models are created using a browser and models are just "a bookmark away", contribution and sharing of process models is eased. Using a plugin mechanism and stencil technology, Oryx is extensible. Today there are stencil sets for different process modeling languages, including BPMN [1], EPC [3], Petri nets [4], and Workflow nets [7]. But the extensibility is not restricted to process languages. The plugin mechanism also facilitates the development of new functionality, for instance mappings to executable languages, thereby providing a business process management framework.

The rest of the paper is structured as follows. Section 2 highlights the most important requirements for the use case scenarios addressed. Section 3 outlines how these requirements are addressed in the Oryx framework by discussing its architecture. Finally, a conclusion is given in Section 4.

2 Oryx Use Cases

Most importantly, there must be editing functionality for graphical business process models. Different modeling languages are present in the BPM field. Probably most prominently, there are the Business Process Modeling Notation (BPMN [1]) and event-driven process chains (EPC [3]). Here, the corresponding stencil sets must be available and certain restrictions on the models that can be created must be enforced. E.g. it must not be possible to connect two events in an EPC or to have incoming sequence flow into a start event in BPMN.

Once process models have been created, it must be verified if the models are free of modeling errors, e.g. using one of the "soundness" notions. Such analysis requires that the diagrams are not just interpreted as mere collection of nodes and edges. Elements must be properly connected, for instance BPMN tasks with preceding or succeeding tasks, or tasks with their parent subprocess or pool. BPMN comes with a special challenge, namely attached intermediate events, where a node is directly connected to another node without edges in between.

Process models are subject to transformations. E.g. BPMN models must be transformed to Petri nets in order to carry out analysis. In other scenarios, high-level models serve as input for generating stubs for more technical models. As an example, BPMN models can be transformed to Business Process Execution Language (BPEL) processes. In order to ease integration with other systems, common interchange formats must be supported.

3 Oryx Overview

Figure 1 depicts the Oryx architecture. While the current release requires a specific Oryx backend, in theory any location on the Web will do. Oryx itself is a set of Javascript routines loaded into a web browser as part of a single document describing the whole model. Models are represented in RDF format. The Oryx

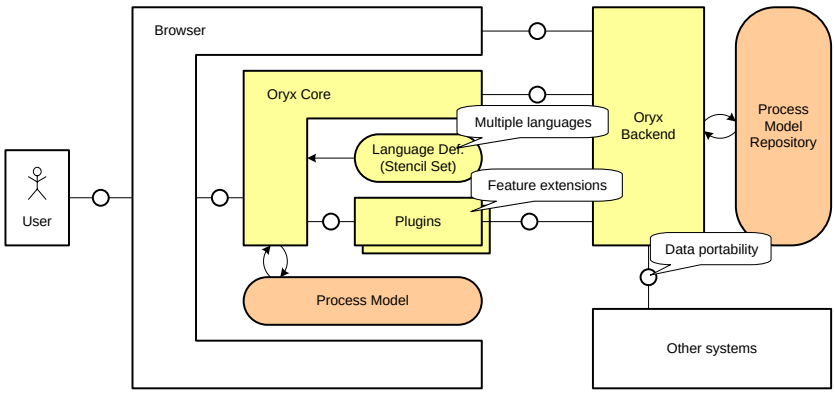

Fig. 1. Oryx architecture

core provides generic handling of nodes and edges; how to create, read, and update them; as well as an infrastructure for stencil sets and plugins.

Language Support via Stencil Sets Stencil sets drive the Oryx core, as they provide explicit typing, connection rules, visual appearance, and other features differentiating a model editor from a generic drawing tool. Hence, a stored Oryx model is structure first, directly based on the loaded stencil sets, visual diagram second. Oryx today has full support for BPMN 1.0 and 1.1. In addition, there is a stencil set for EPC and Petri nets.

Feature Extensions via Plugins Plugins allow for both generic as well as notation-specific extensions. E.g. element selection and cut & paste are plugin features, as they are not needed for an Oryx viewer. More advanced plugins allow for complex model checking beyond the powers of the stencil set language. For instance, a BPMN to Petri net mapping is included as specified in [2] as well as BPMN to BPEL transformation [5], XPDL serialization for BPMN and soundness checking.

Data Portability beyond Oryx The Oryx core, with the help of stencil sets and plugins, allows users to create, edit, and view visual models within a browser. Currently, Oryx does so by self-modifying the loaded page and sending it back to

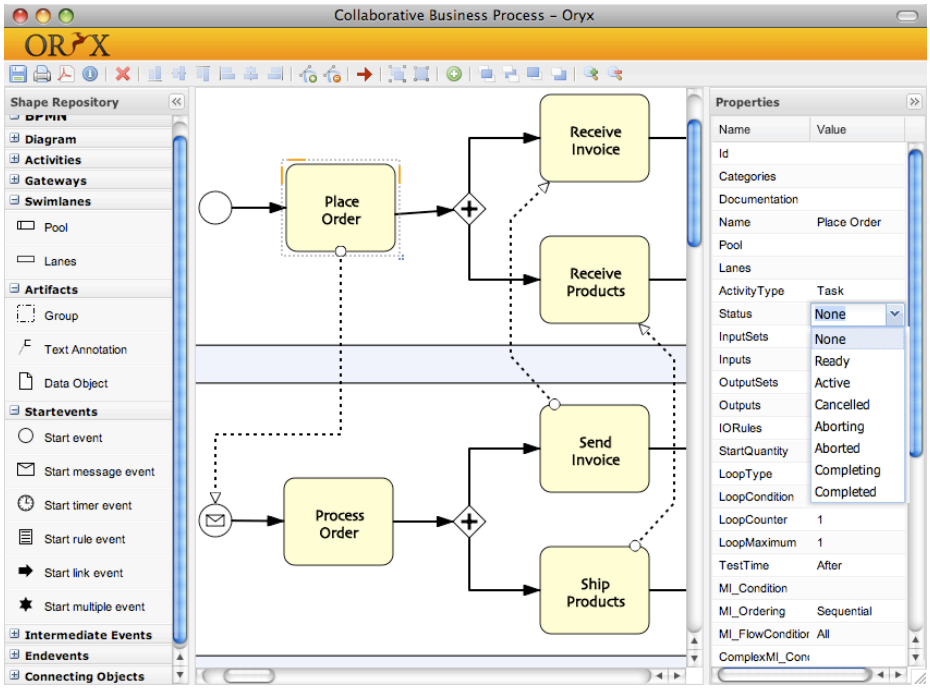

Fig. 2. Oryx for BPMN: Modeling by drag and drop of notational elements shown on the left hand side. Right hand side shows all BPMN 1.0 attributes of a selected model element, here the Place Order activity.

the server in whole. Being web-based Oryx reduces deployment and collaboration to distributing a single bookmark.

4 Conclusion and Outlook

Oryx is an extensible platform for process modeling on the web. Using its extension mechanism, it aims at providing a platform to be used by the BPM community. Researchers can use the platform to implement extensions and thereby to evaluate their particular research question.

Researchers often lack access to business process models. Companies are always reluctant to provide public access to their models, so that generally few business process models are available to the public. Oryx maintains a repository of business process models. Each user can define visibility of his process models to "public", so that it can be read and evaluated by anybody accessing Oryx. While this technical feature does not solve the organizational problem of companies, we believe that, with your help, the Oryx process model repository will grow over time to a valuable resource for the BPM community. We encourage our industrial partners to use the Oryx modeling platform and to share an anonymous version of their models for scientific usage.

We invite all interested parties to use Oryx in their own research work, and to contribute to this open source project.

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