Experiencing Process Flexibility Patterns with Alaska Simulator

Barbara Weber[1], Stefan Zugal[1], Jakob Pinggera[1], and Werner Wild[2]

[1]Quality Engineering Research Group, University of Innsbruck, Austria
{Barbara.Weber, Jakob.Pinggera, Stefan.Zugal}@uibk.ac.at
[2]Evolution Consulting, Innsbruck, Austria
werner.wild@evolution.at

Abstract. Alaska Simulator is an interactive software tool developed at the University of Innsbruck which allows people to explore different approaches to process flexibility by using a familiar metaphor, i.e., travel planning and execution. In addition, Alaska Simulator is used for studying research questions in the context of business process management and other related fields. For this, Alaska Simulator provides integrated support of different approaches to process flexibility in terms of decision deferral patterns, which all allow interleaving process modeling with execution and provide mechanisms for effectively dealing with uncertainty. The biggest challenge for users of such flexible systems is to find the right balance between pre-planning activities and keeping options open. To address this challenge Alaska Simulator allows safe exploration and systematic investigation of how much pre-modeling is needed under different circumstances.

1 Introduction

Alaska Simulator has been developed to support the teaching of different approaches for process flexibility and to investigate their strengths and weaknesses through the execution of controlled experiments. Due to the many similarities between modeling and executing business processes and journey planning Alaska Simulator uses a journey as a metaphor [1]. The used metaphor is not only helpful to explain different flexibility approaches to people without significant experience in business process management, but is also an attractive context to be engaged in, thus increasing the willingness of subjects to participate in experiments. In the following, we describe the different approaches for process flexibility supported by Alaska Simulator (cf. Section 2), participating roles in the form of personas [1] and how they can work with and benefit from Alaska Simulator (cf. Section 3).

[1] For a detailed description of the journey metaphor visit the simulator's website: http://www.alaskasimulator.org

2 Process Flexibility Support in Alaska Simulator

In today's dynamic business world the economic success of an enterprise depends on its ability to react to changes in its environment in a quick and flexible way. To address this need several approaches for flexible process support have been proposed. All of these approaches address the problem of process change either through structural modifications of a predefined workflow (e.g., adaptive workflows [2]) or the introduction of more flexible execution models, which allow users to defer decisions regarding the exact control-flow to run-time (e.g., Late Binding, Late Modeling or Late Composition, for an overview see [3]). Common to all these approaches is the fact that they relax the strict separation of build-time (i.e., planning) and run-time (i.e., execution), which has been typical for plan-driven planning approaches as realized in traditional workflow management systems (cf. Figure 1). They allow for a more agile approach by closely interweaving process modeling and execution.

No flexibility for changing the process definition during run-time is supported by a *traditional workflow system*, i.e., the modeled process schema *cannot* be altered at run-time. The *Late Binding* pattern provides flexibility by allowing for the introduction of a placeholder during modeling. At run-time the user defines the content of the placeholder by selecting the most appropriate process fragment from a pre-defined set. *Late Modeling* further extends the concept of Late Binding by enabling the user to model the content of the placeholder during run-time – the activities users can insert may be restricted when creating the process model. *Late Composition* offers the highest degree of flexibility by allowing the user to flexibly compose the businesss process at run-time and to freely switch between process modeling and execution.

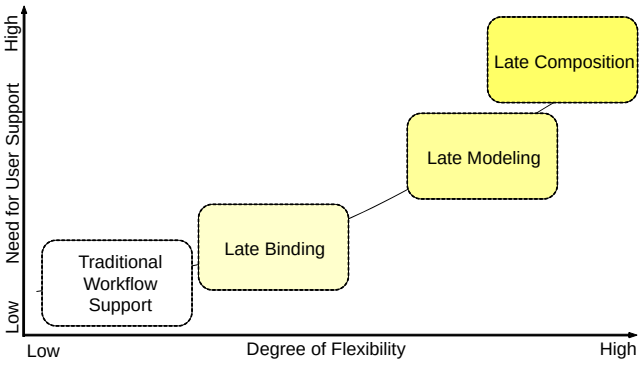

Fig. 1. Decision Deferral Patterns

Alaska Simulator is the first tool providing integrated support for all of these decision deferral patterns fostering the systematic comparison of their strengths and weaknesses in a training environment.

3 Major Roles and Main Functionalities

AST consists of three major components: Alaska Simulator, Alaska Configurator and Alaska Analyzer. This section describes participating roles in the form of personas [1] and explains how they can interact with and benefit from the Alaska Simulator Toolset (AST).

- *Steve Student:* tests and analyzes his planning behavior with the simulator and explores how much planning is just enough under different circumstances
- *Rose Researcher:* investigates the strengths and weaknesses of different approaches to process flexibility using the simulator (for example see [4] for the results of a recently conducted experiment using Alaska Simulator)
- *Isabel Instructor:* demonstrates the different flexibility approaches using a journey as a metaphor and explains the major differences between these techniques

The major features of AST are as follows:

- **Design journey scenarios:** Alaska Configurator allows researchers and instructors to design their own journey scenarios including locations, actions, events, constraints as well as the degree of uncertainty (cf. Fig. 3)
- **Plan and execute journeys :** Alaska Simulator allows to plan and execute journeys using different approaches to process flexibility (cf. Fig. 2)
- **Log journeys:** Each step that is performed while planning and executing a journey is logged by Alaska Simulator for later investigation and detailed analysis
- **Replay journeys:** To enable interactive analysis of planning behavior, journeys can be replayed step by step in Alaska Simulator
- **Analyze journeys:** Instructors and researchers are supported in analyzing the journeys after a planning session has been conducted with Alaska Analyzer

Alaska Simulator, including a test configuration, extensive documentation and screencasts can be downloaded from http://www.alaskasimulator.org. Alaska Configurator and Alaska Analyzer are available to interested parties upon request. For detailed information on the results of a controlled experiment which was conducted using Alaska Simulator we refer to [4].

References

1. Cooper, A.: The Inmates Are Running the Asylum. Sams (1999)
2. Reichert, M., Dadam, P.: ADEPT$_{flex}$ – Supporting Dynamic Changes of Workflows Without Losing Control. JIIS **10** (1998) 93–129
3. Weber, B., Reichert, M., Rinderle, S.: Change Patterns and Change Support Features - Enhancing Flexibility in Process-Aware Information Systems. Data Knowledge Engineering **66** (2008) 438–466
4. Weber, B., Reijers, H., Zugal, S., Wild, W.: The declarative approach to business process execution: An empirical test. In: Proc. CAiSE'09. (2009) 470–485

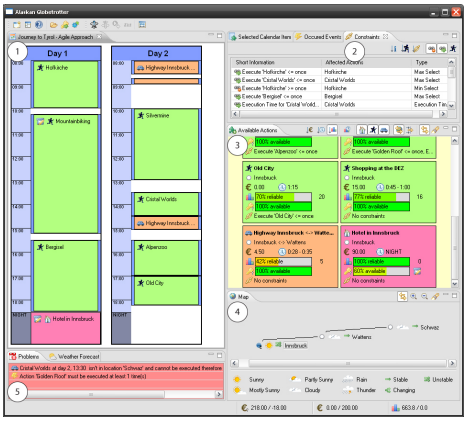

Fig. 2. Screenshot of Alaska Simulator: The Planning Editor (1) provides a convenient tool for planning and executing journeys (i.e., the business process); the Actions View (3) lists available actions. The Constraints View (2) on the right top corner shows constraints restricting the journey. To assist the user in developing a consistent plan, the Problems View (5) points out inconsistencies and constraint violations. The Map View (4) offers an overview of all locations and indicates the traveler's current location.

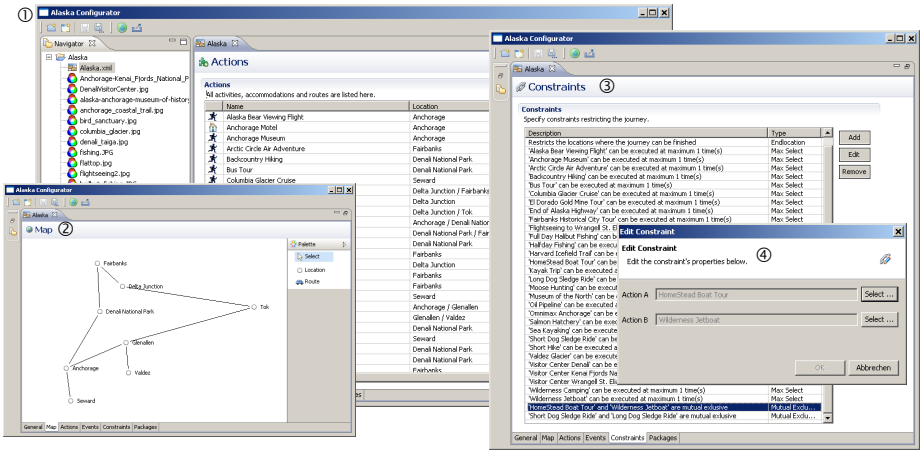

Fig. 3. Alaska Configurator allows users to compose journey configurations including actions (1), locations (2), constraints (3+4) and events to set up controlled experiments