Alaska Simulator Toolset for Conducting Controlled Experiments
– Tool Paper –

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Abstract. Alaska Simulator Toolset is an interactive software suite developed at the University of Innsbruck which allows to explore different approaches to process flexibility by using a familiar metaphor, i.e., travel planning and execution. In particular, Alaska Simulator Toolset is used for studying research questions in the context of business process management and other related fields. For this, Alaska Simulator Toolset provides integrated support of different approaches to process flexibility fostering their systematic comparison. Moreover, Alaska Simulator Toolset facilitates the design and execution of controlled experiments through experimental workflow support.

Providing effective IT support for business processes has become an essential activity of enterprises in order to stay competitive in today's market [1]. When assessing the usability of BPM approaches, however, enterprises have to rely on vendor promises or qualitative data rather than on empirical or experimental research [2]. This is rather surprising as these research methods have been successfully applied in similar research areas like software engineering (e.g., [3, 4]). Alaska Simulator Toolset (AST) has been developed to address this need and allows the investigation of strengths and weaknesses of different approaches for process flexibility through the execution of controlled experiments. Due to the many similarities between business processes modeling and execution and journey planning, AST uses a journey as a metaphor[1]. Furthermore, the used metaphor provides an attractive context to be engaged in, thus increasing the willingness of subjects to participate in experiments. AST consists of three major components: *Alaska Configurator*, *Alaska Simulator* and *Alaska Analyzer*. In the following we describe the main functionalities of AST and how design and execution of controlled experiments is supported using the experiment described in [5] as example (cf. Fig. 1 for the experimental design).

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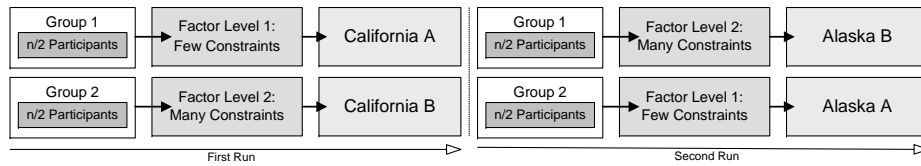
Fig. 1. Experimental Design

Alaska Configurator was used to design two journey configurations (California and Alaska) including locations, actions, events, constraints as well as variability of weather conditions. For each journey configuration two variants were created, one for each factor level (i.e., few and many constraints). To gather the participants' demographic information Alaska Configurator was used for designing a survey. The journey configurations and the survey were then assembled to an experimental workflow.

During experiment execution participants were guided by the experimental workflow. After presenting them with a survey, half of the students obtained configuration California with few constraints, while the second half obtained the same configuration with many constraints. The students then planned and executed a journey to California. Each step that was performed while planning and executing was logged for later investigation and detailed analysis. Having completed their California journeys, subjects planned and executed a journey to Alaska.

After the planning session researchers were supported in analyzing the journeys by enabling them to replay journeys step by step using Alaska Analyzer.

Alaska Simulator, including a test configuration, extensive documentation and screencasts can be downloaded from http://www.alaskasimulator.org. For detailed information on the results of a controlled experiments which was conducted using Alaska Simulator we refer to [5].

References

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