Changes in Process Life Cycle:
Requirements Analysis for Visualizations

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Motivation

Process models evolve over time. Hence changes are necessary and have an impact on security-relevant information in each phase of the business process life cycle, e.g., because of:

- incomplete specifications because events cannot always be prescribed
- modifications that are based on new or changed conditions

Visualizations are helpful, because they:

- help users to understand the changes and their dependencies easier
- make things visible or present things in a new light that users were not aware of before and support them in their decisions

State of the Art

Characteristics of Changes

- Ad-hoc vs. Evolutionary
  - Ad-hoc changes are only relevant for one or more selected process instances
  - Evolutionary changes are modifications of the process model that are relevant for all instances
- Entry Time vs. On-the-fly
  - Entry time means that changes can be performed only before the process instance is created
  - On-the-fly means that changes can be performed at any time and they can have an impact on running as well as new process instances
- Change Patterns
  - Change patterns specify how processes can be changed

Visualization Approaches

- Graph
  - Business processes are usually visualized as directed graphs to make the flow of resources, tasks, and time visible
- 3D vs. 2D
  - 3D is a possibility to encode further information in a single view
- Animation
  - Animations can help users to trace changes and to understand the process flow more easily

Methodology

For an effective use of visualizations, it is important that the design meets users' needs and is adequate for the tasks users want to solve with the visualization. For the requirement analysis we used:

- Literature review
  - What are the characteristics of changes in processes?
  - Which visualization approaches exist already?
- User survey
  - Which experiences do users have with process visualizations?
  - Which expectations do users have of the visualization of changes in processes?

Requirements

- Clear change representation
  - to enable users to track the changes between the different versions
- Visibility of relationships between versions
  - to see the dependencies between the different process versions
- Different views
  - to support users in analyzing changes from different perspectives
- Interaction
  - to support strategies for manipulating the visualization

Future Work

We will investigate different forms of presentation for analyzing change information and we plan to design multi-modal approaches (e.g., to combine visualization methods with sonification methods) especially in cases where visualizations reach their limits.

References


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