

Development of a BPMN Model Validation and Automatic Correction Tool for SAP Solution Manager

2019-11-25

Bachelor Thesis Defense

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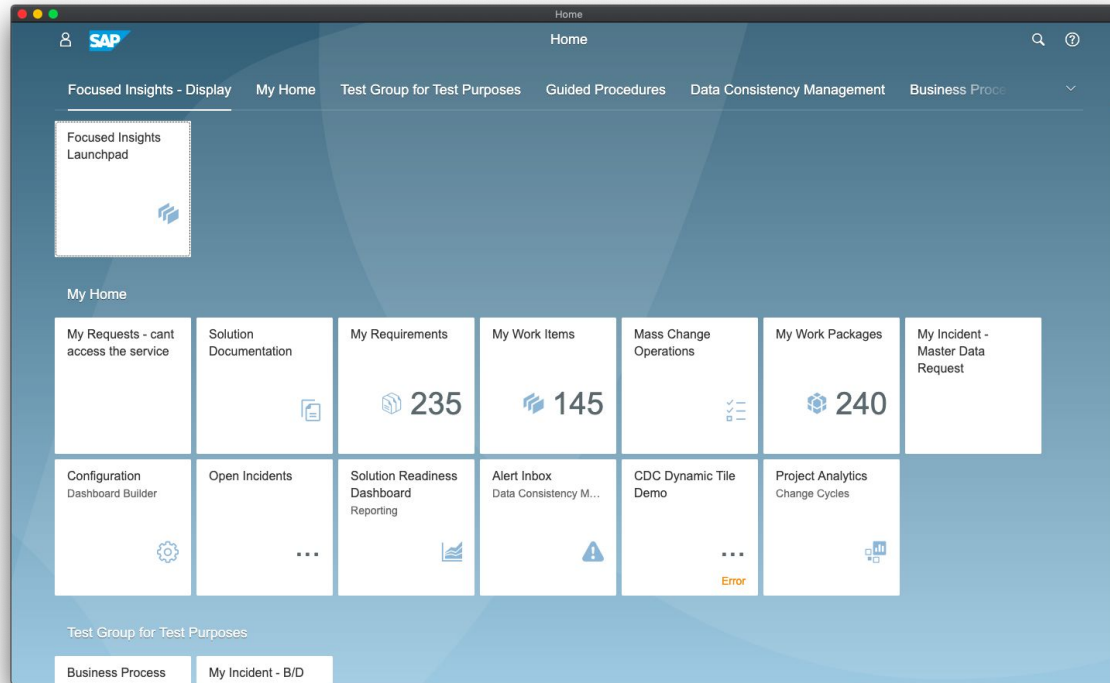
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Development of a **BPMN** Model Validation and Automatic Correction Tool for **SAP Solution Manager**

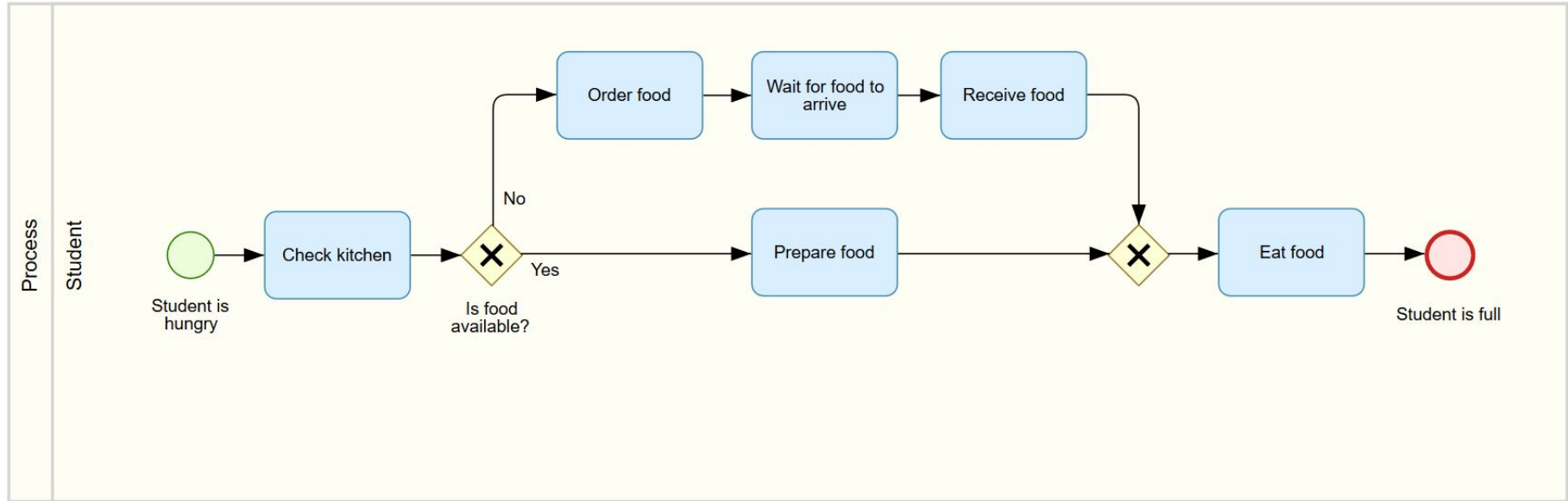
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Bachelor Thesis Defense

SAP Solution Manager



Business Process Model and Notation (BPMN)



What did I create?

- A web-based program...
 - ...that detects violations of selected readability criteria and corrects them.
 - ...designed with BPMN models created in SAP Solution Manager in mind.

Why was it created?

- Improve pragmatic quality of BPMN models
- Feature provided by similar products
- Proposal by Vostura GmbH
- Personal experience

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How did I create it?

1. Selection of Guidelines
 - a. Research and Initial Evaluation of Guidelines
 - b. Selection Criteria
2. Proof-of-Principle Prototype
3. Implementation of the Tool
 - a. Usability Tests

Research and Initial Evaluation of Guidelines

Process Diagram 2

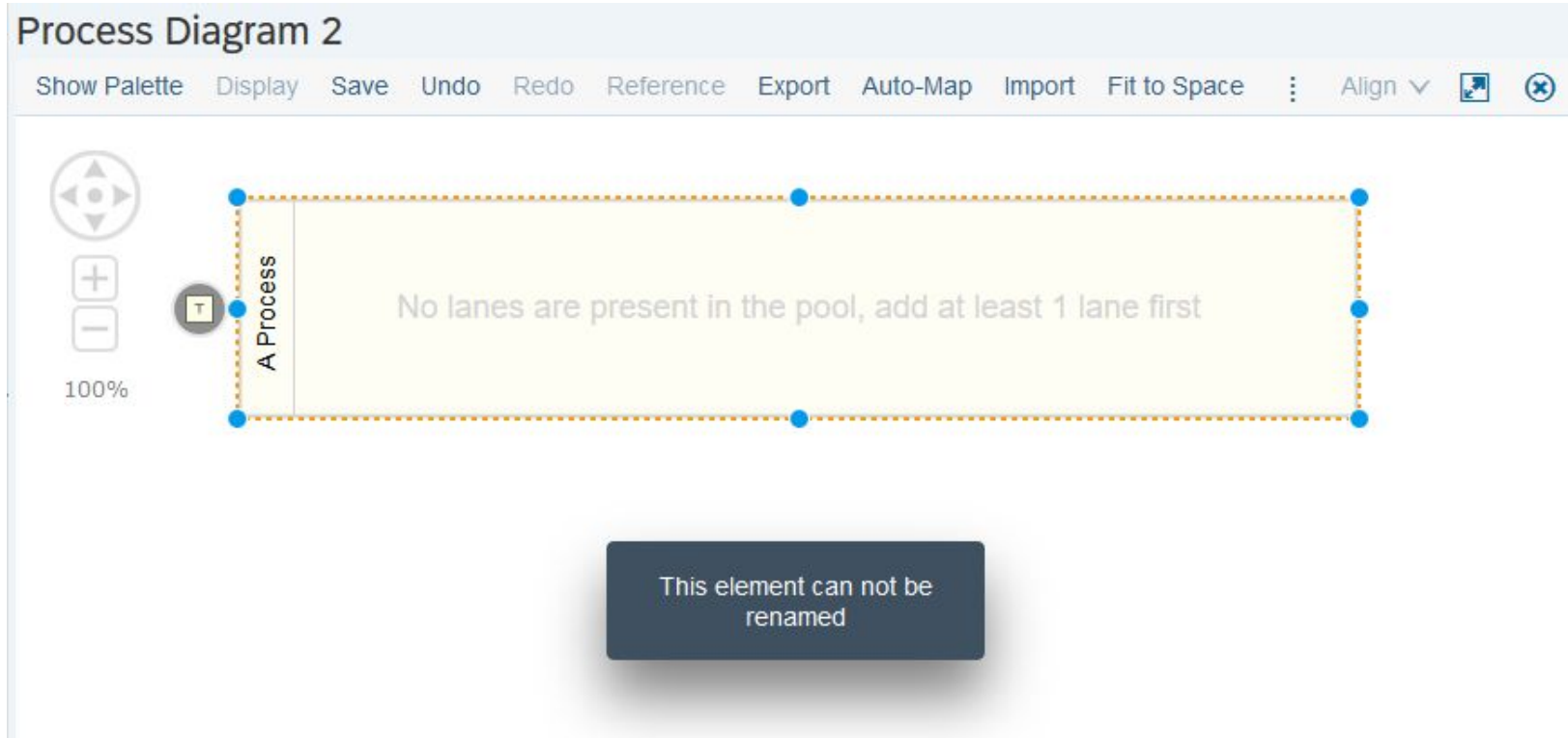
Show Palette Display Save Undo Redo Reference Export Auto-Map Import Fit to Space : Align ▾  




100%

A Process

No lanes are present in the pool, add at least 1 lane first

This element can not be renamed



Selection Criteria

- Part of BPMN guidelines as defined by Vostura
- Possibility of automatic adjustment
- Feasibility of implementation
- Frequency of violations based on project samples

Proof-of-Principle Prototype

- Will it work?
 - Upload
 - Read
 - Display output
 - Modify
 - Download

Usability Tests

- First round: Vostura employees
- Second round: FU Computer Science students
- Evaluation of the tool by participants
- Observation of how participants used the tool
- Feedback → Improvements

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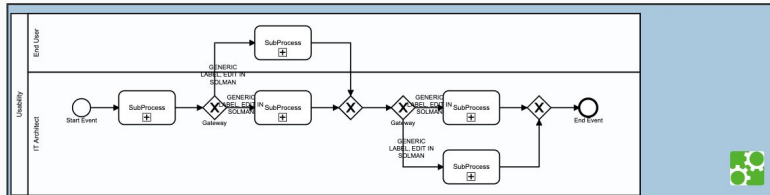
V. Personal Lessons

BPMN Model Validator and Corrector

BPMN Model Validator and Corrector

Corrected Diagram

Hold the **Ctrl** key while scrolling with your mouse or touchpad to zoom in and out of the diagram. You can also drag the diagram around.



BPMN Validation Report

Absence of Start Event
A model should have at least one start event. This helps the model represent reality. It also improves the model's understandability.
 ✓At least one Start Event found.

Absence of End Event
A model should have at least one end event. This helps the model represent reality. It also improves the model's understandability.
 ✗End Event missing.
Fix applied:
 End Event automatically generated and added.

Mixed-Use Gateways
Gateways should not show splitting and joining behavior at the same time. If a gateway has multiple inputs and multiple outputs at the same time, this should be split to improve the model's understandability.
 ✗1 mixed-use gateway found.
Fix applied:
 Mixed-use gateways split.

Unlabeled Sequence Flows
Sequence flows from splitting XOR gateways should be labeled.
 ✗4 unlabeled outgoing sequence flows from splitting gateways found.
Fix applied:
 Labels added to unlabeled outgoing sequence flows.

Implemented Guidelines

- Insertion of missing elements

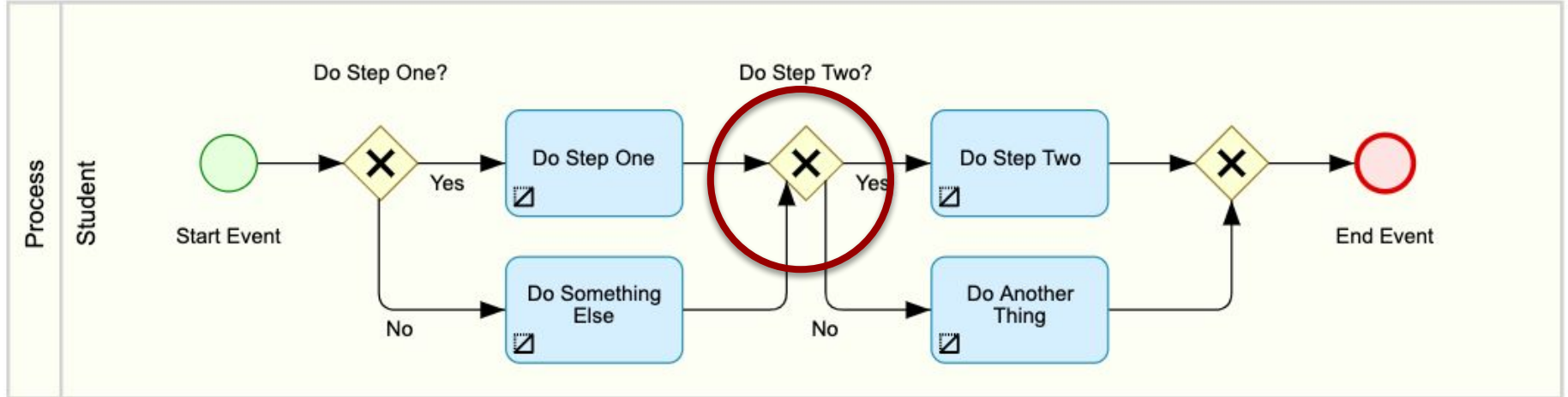
- Absence of start events
- Absence of end events
- Mixed-use gateways
- Absence of explicit gateways

- Insertion of missing attributes (labels)

- Unlabeled sequence flows
- Unlabeled gateways
- Unlabeled events

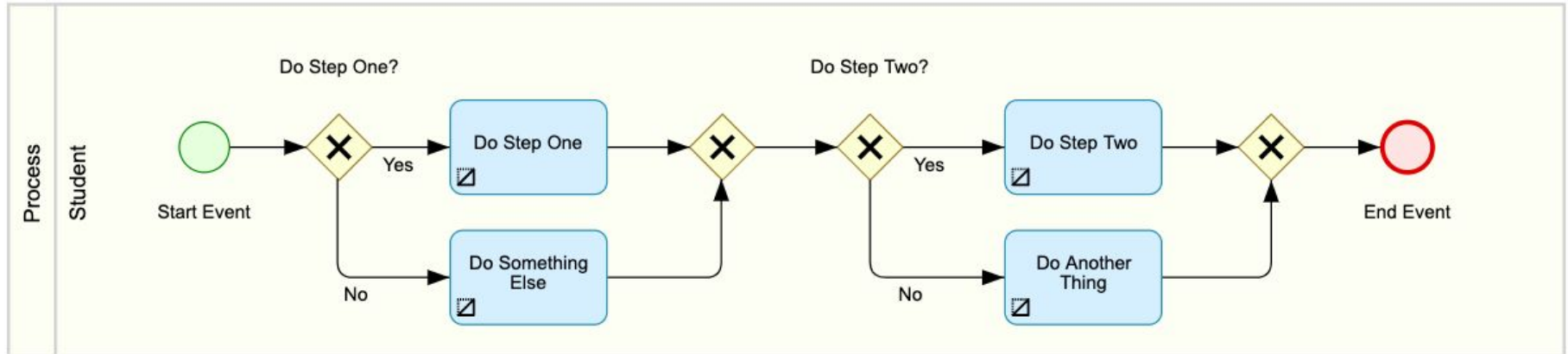
Example: Mixed-Use Gateways

✗ Wrong:



Example: Mixed-Use Gateways

✓ Correct:



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Suggested Future Work

- More guidelines and wider scope
- Configurability
- UI/UX improvements
- More usability tests

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Personal Lessons

- Pen-and-paper programming
- Development journal
- Productivity in difficult situations

Thank you!
Any questions?

Demonstration of the Tool

<http://ren.userpage.fu-berlin.de/thesis/webapp/>