TECHNISCHE UNIVERSITÄT DRESDEN

Faculty of Computer Science Institute of Software and Multimedia Technology

Software Technology Group

Topic of the Bachelor Thesis

Evaluating the Consistency between Business Process Models and Business Role-Object Specifications

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1 Motivation

Today's software construction methods depend heavily on suitable defined models to specify the software's structure and behavior. On the one hand, for structural definition, often UML's structure diagrams are used, such as, class diagrams or component diagrams. On the other hand, procedural models are used to represent the behavior site of the software, e.g., BPMN diagrams, sequence diagrams, or petri nets. Nevertheless, there

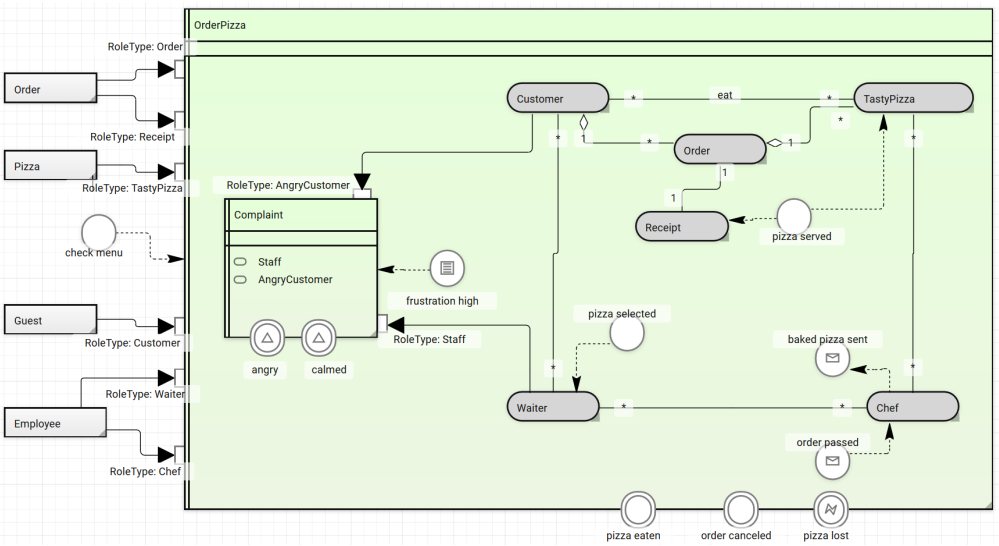

Figure 1: Example BROS model of a pizzaria's order process.

is a gap between those two modeling perspectives: while the business requirements are modeled in procedural models, the actual implementation of the software cannot be done without the structural models. Thus, the structural models need to be aligned towards the behavior models so that the software system developed subsequently also implements the business requirements defined in the procedural models. In short, the used structure for the software system must adhere to the procedural business requirements. (means, to establish consistency).

2 Problem Definition

Currently, there is no systematic way to specify procedural business requirements (in the form of, e.g., BPMN processes) within structural models of the software to ensure such consistency. As a first approach, the *Business Role-Object Specification* (BROS) language [1] copes with this issue by introducing temporal elements into a static structural model specification. However, ensuring and checking the consistency of BROS with a given procedural business requirement is a manual, complex, and error-prone task.

3 Goals of this Thesis

In this thesis, the consistency between BROS and the procedural BPMN is investigated. For that, the modeling elements within a BROS and a BPMN model are compared with each other to identify any mismatch regarding several consistency concepts, called *consistency constraints*. Based on this analysis, warnings are given to the modeler, if consistency constraints are violated and how to possibly solve the issues. This task is performed automatically via a tool that is integrated into the existent BROS modeling editor `Framed.io`,[1] whereas BPMN models are provided via `bpnm.io`.[2] Furthermore, to increase its value and agility for future developments, the tool must be extensible by new consistency requirements.

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References

[1] Hendrik Schön, Susanne Strahringer, Frank J Furrer, and Thomas Kühn. Business role-object specification: A language for behavior-aware structural modeling of business objects. In *Internationale Tagung Wirtschaftsinformatik*, pages 244–258. Universität Siegen, 2019.

[1] https://github.com/Eden-06/FRaMED-io
[2] https://bpmn.io