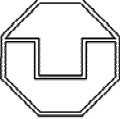


# A Software Development Process Supporting Non-functional Properties

Simone Röttger, Steffen Zschaler  
COMQUAD project  
Dresden University of Technology

# Outline

- **Motivation**
- **Roles in Design**
- **Tool-Supported Refinement**
- **Conclusion & Outlook**



# What do we want?

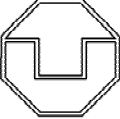
- **COMQUAD =**  
**Components with Quantitative Properties and Adaptivity**
- **Project objectives:**
  - development methodology and
  - runtime environment

} for QoS-aware and adaptable components
- **This presentation: concentration on methodology and related aspects**

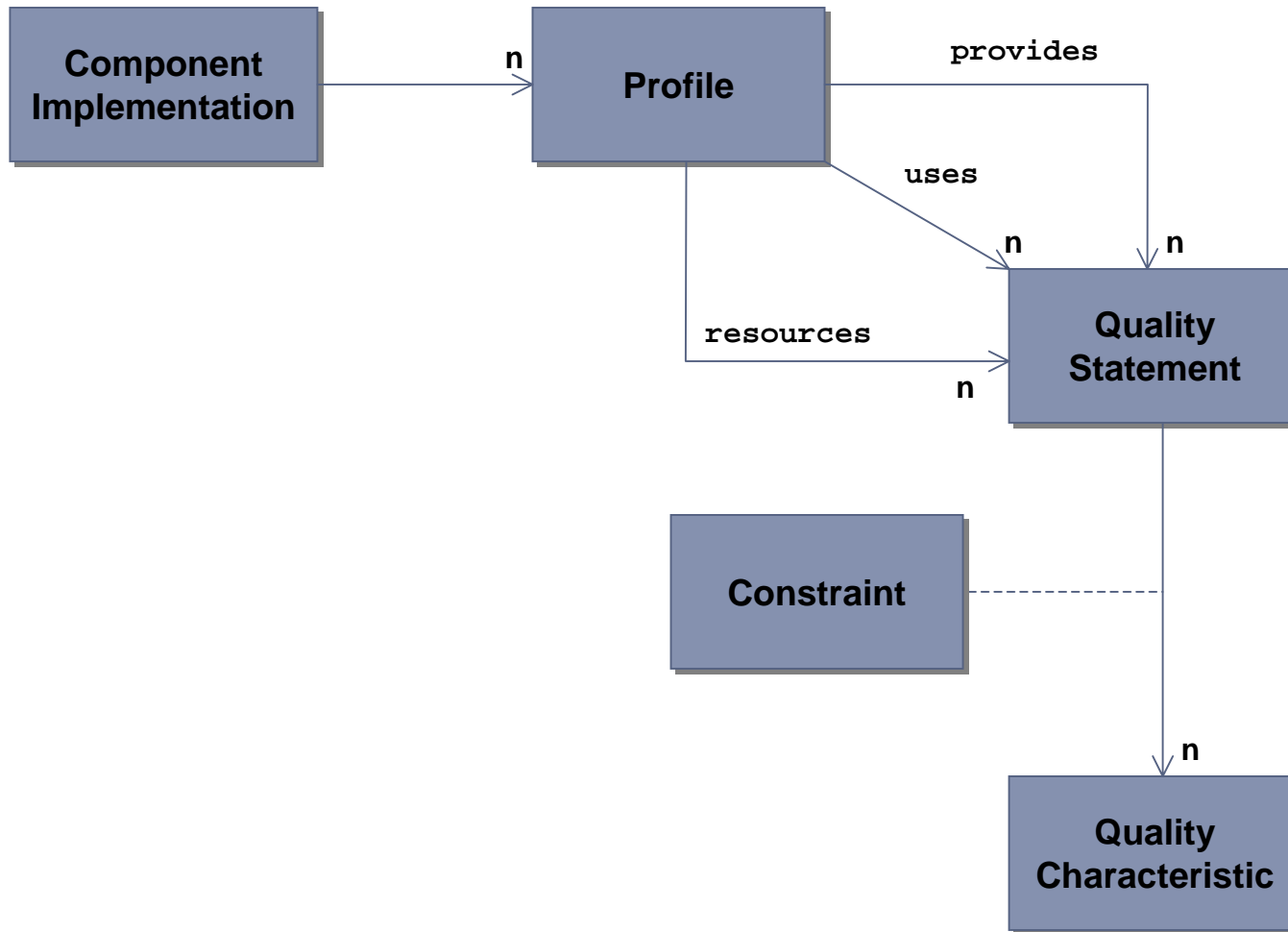
## Main thesis:

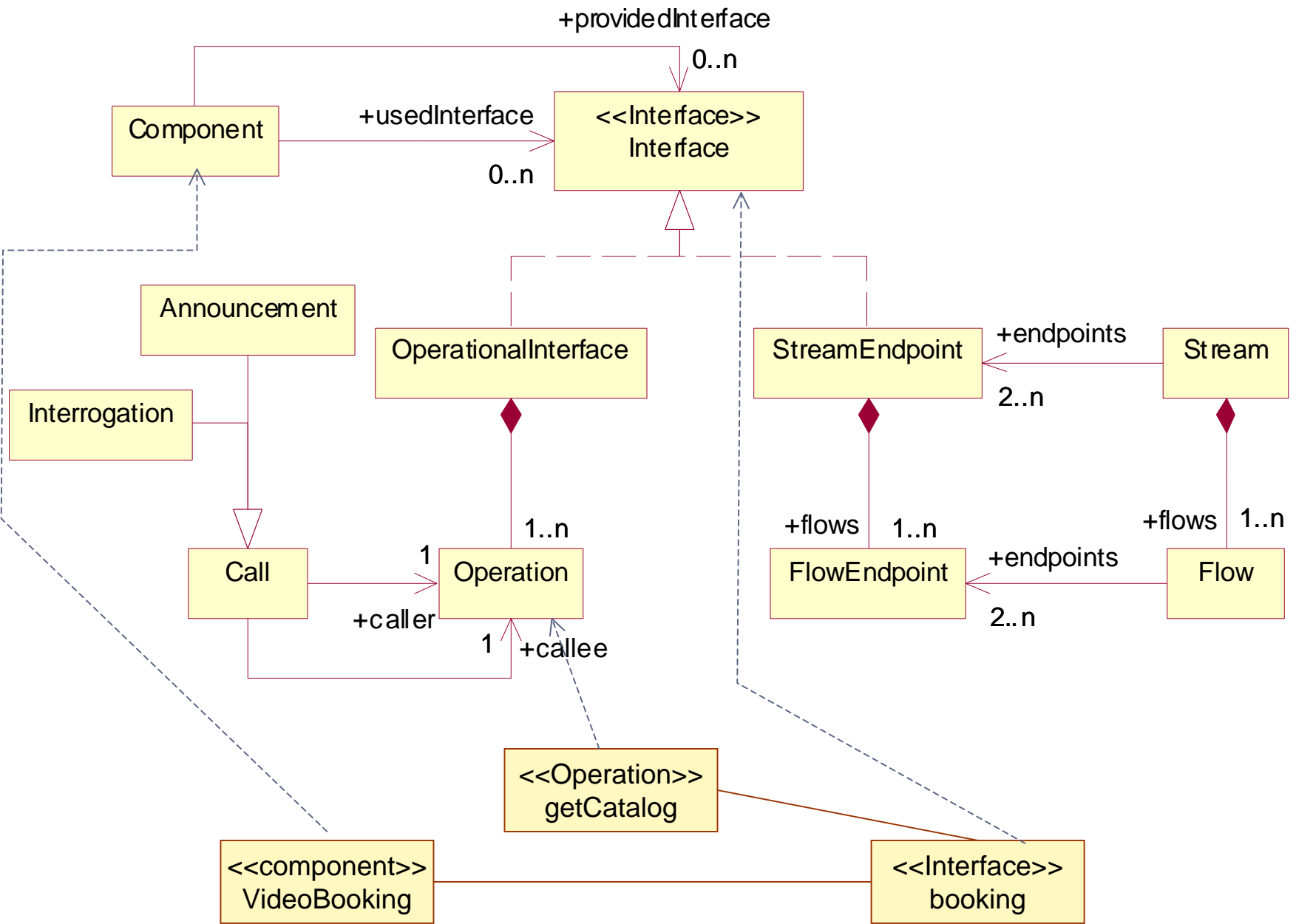
Non-functional properties constitute a project risk and need to be considered as early as possible during development.

# CQML+: A Language for QoS Specification



## ■ Based on CQML (Aagedal)





# How can this be improved?

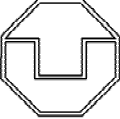
## ■ Specification mixes two issues:

- Definition of measurements

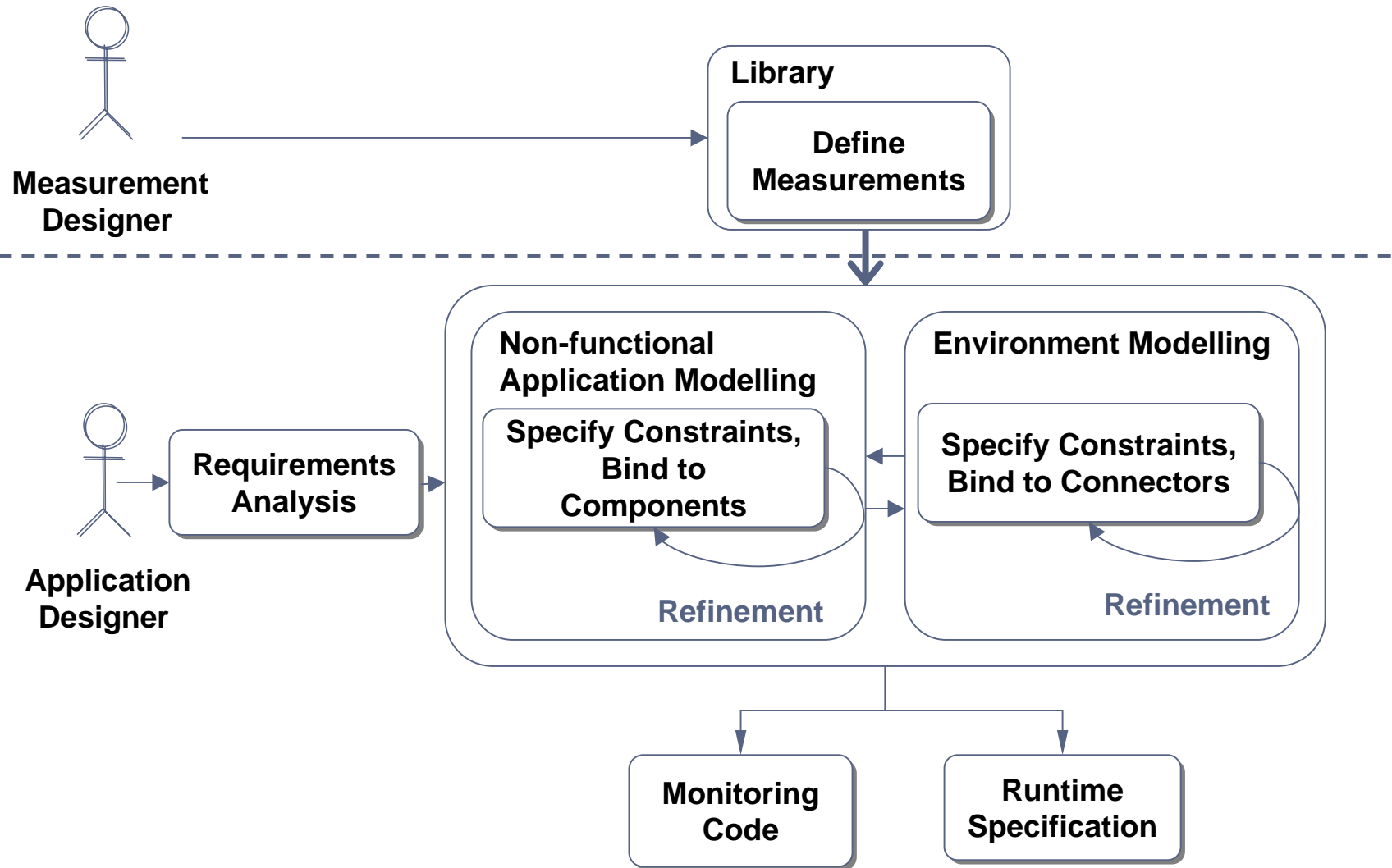
```
quality_characteristic response_time (op: Operation) {  
    domain: numeric real [0..) milliseconds;  
    values: ...  
}
```

- Application of measurements to constrain application model

```
quality good_response (op: Operation) {  
    response_time (op) < 500;  
}  
  
profile goodCatalogResponse for VideoBooking {  
    provides good_response (booking.getCatalog);  
}
```



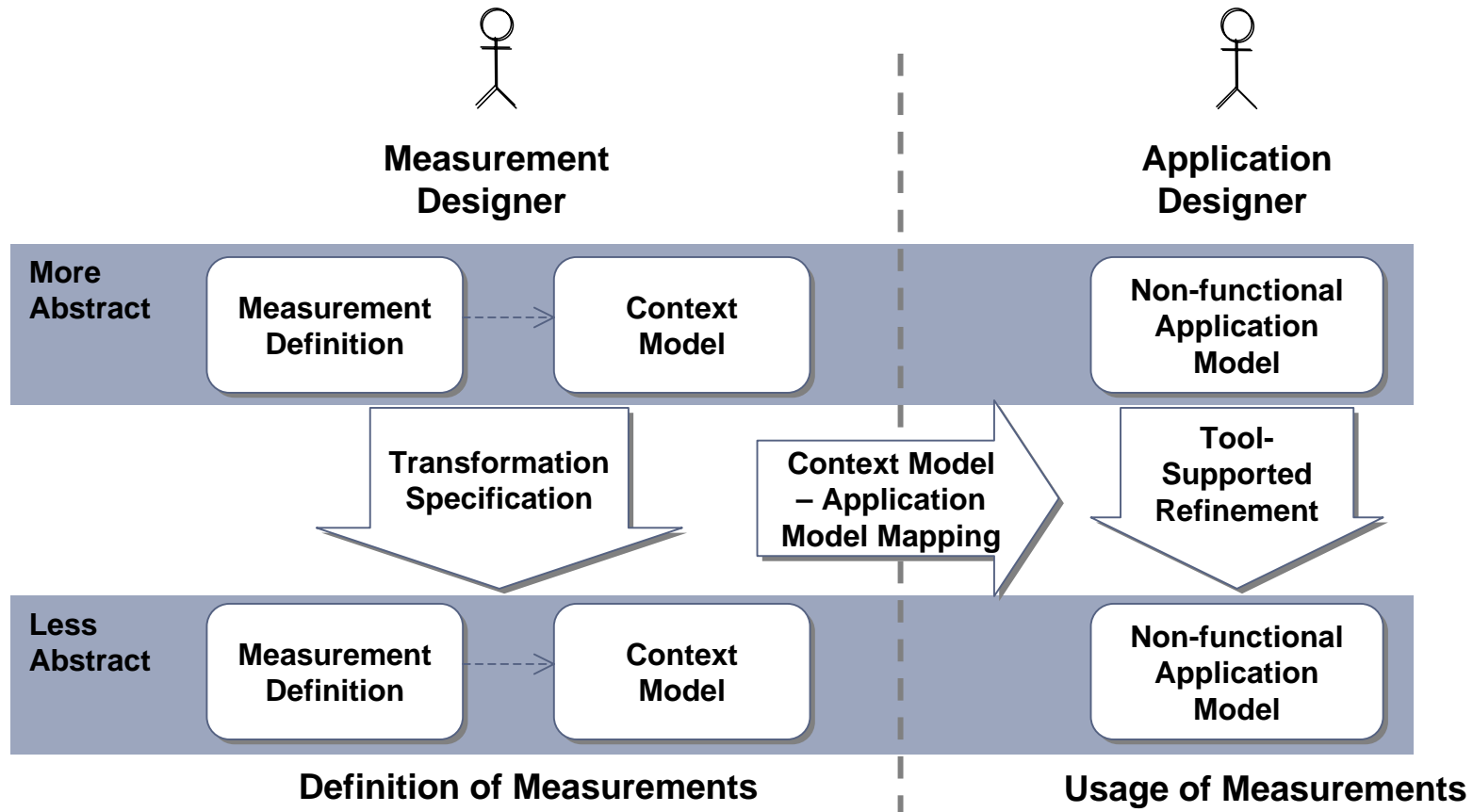
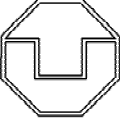
# Two New Roles



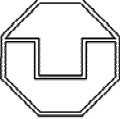
- **Measurement Designer must be independent of concrete applications**
  - ***Context Models* capture application parts essential for definition of a measurement**
    - Both structural and behavioural
    - Apply measurement to application model iff application model implementation of context model
  
- **Context models can be defined at various levels of abstraction**
  - Allows refinement support for application designer



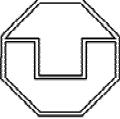
# Tool-Supported Refinement



- **Separated definition of measurements from their usage**
  - Measurement Designer vs. Application Designer
  - Context Models
- **Provided tool-based refinement support for application designer**
  
- **Future work:**
  - Define specification language for context model transformations
  - Complete development process
  - Rework and formalize specification language



The End



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University of  
Technology



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