TECHNISCHE UNIVERSITÄT DRESDEN

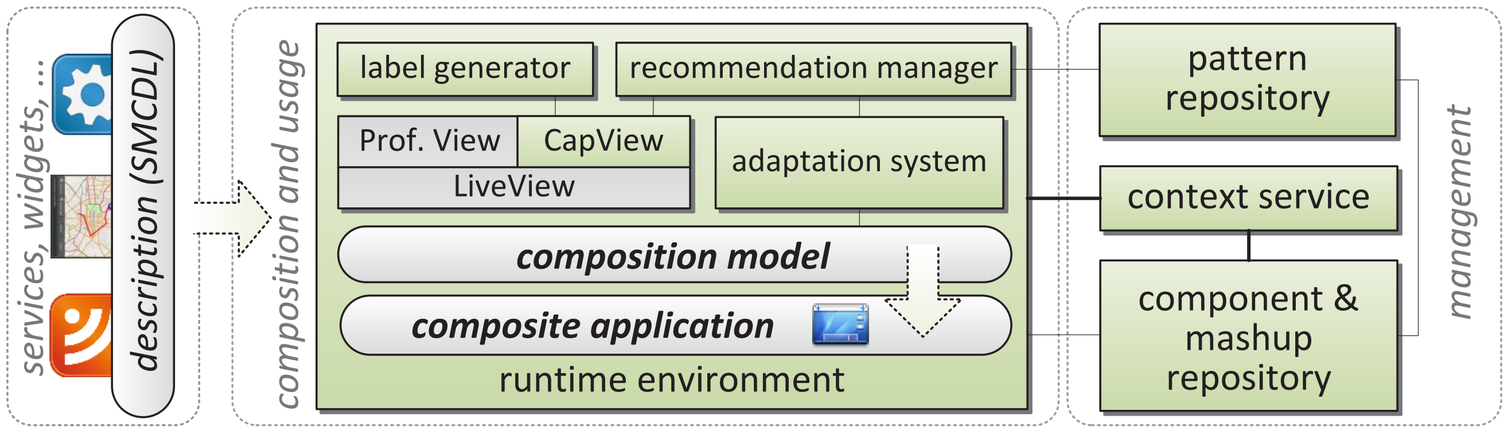
Faculty of Computer Science, Institute of Software and Multimedia Technology, Senior Chair of Multimedia Technology

CapView

Functionality-Aware Visual Mashup Development for Non-programmers

Europa fördert Sachsen. ESF Europäischer Sozialfonds. ESF-080951805

CapView is a functionality-aware development view on running composite applications. It abstracts from interface and wiring details. Centered on component capabilities, CapView enables users to perceive mashup development as a process of assembling component functionalities.



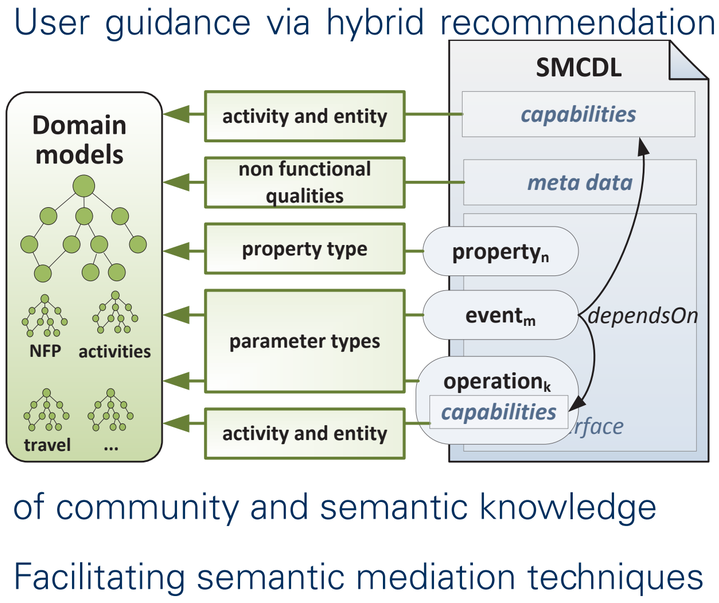
Architectural overview: In the EDYRA platform mashup usage and development are seamlessly interwoven to provide immediate feedback on composition steps. Amongst others, CapView supplemented with recommendations are utilized to enable non-programmers to explore and reconfigure mashup applications.

Motivation and Problem

- The mashup paradigm and end user development (EUD) complement each other well
- Hurdles for non-programmers:
  - » limited understanding of technical concepts
  - » no experience on development practices
  - » mapping domain problems to specific combinations of components
- Requirements for non-programmers EUD:
  - » avoid technical details and terminology
  - » provide user guidance and automation
  - » provide immediate feedback and a task-oriented user interface
- ***Contributions***: CapView enables ...
  - » non-programmers to realize "components" as task solving entities,
  - » explore mashup functionalities,
  - » and visually manipulate a mashup.

CapView Basics

- Assumption: Mashups offer a set of functionalities, which deliver outputs to or consume inputs from other functionalities. Properties represent attributes of components.
- CapView is part of the EDYRA platform enabling "live sophistication" of mashups
- CapView is a view overlaying a running mashup
  - » utilization of natural language to abstract from technical details of a mashup
- Semantic component description (SMCDL)
- User guidance via hybrid recommendation

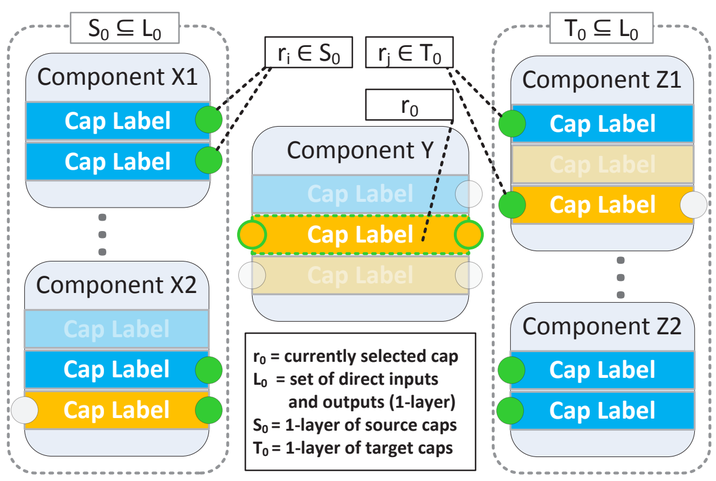


of community and semantic knowledge

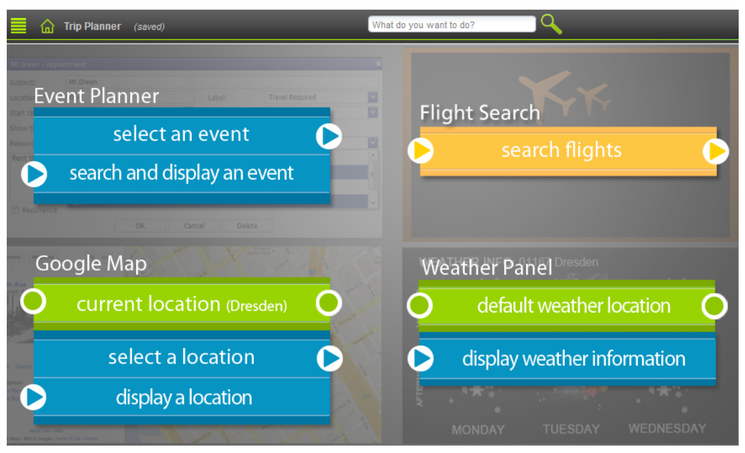
- Facilitating semantic mediation techniques
  - » *splitting location in latitude, longitude*

Visual Exploration

- Natural language labels, derived from semantic annotations, represent capabilities



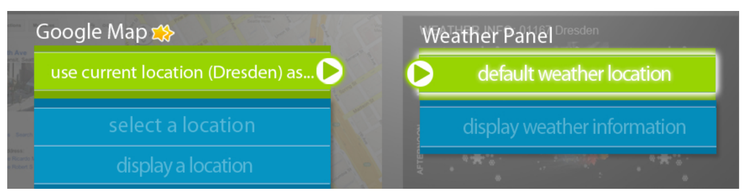
- Color coding:
  - » capabilities according to need of user interaction, e.g., blue (yes) or orange (no)



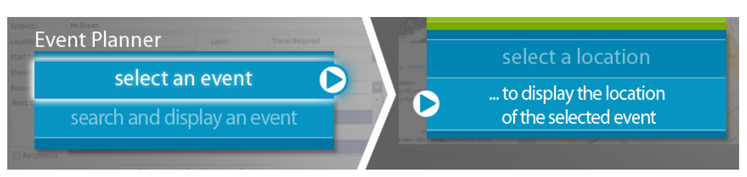
  - » properties are colored uniformely green
- Clustering equal capabilities per component
- Ports represent inputs and outputs and can be connected
- Ports can be selected
  - » all representations *r* within the 1-layer S_0 and T_0 gets relabeled according to r_0 to form human readable phrases
  - » related connections are transitively highlighted

Context Specific Labels

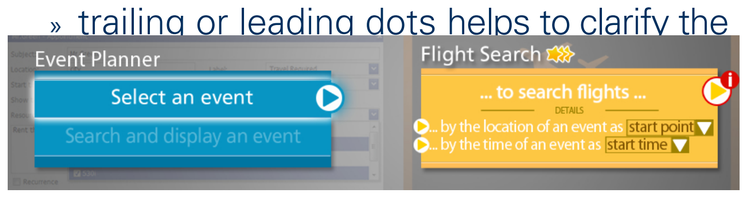
- A generic rule set enables context sensitive label generation for capabilities based on



annotated activities and entities



- The generation process distinguishes two cases, if nothing is selected:
  - » properties are labeled with their ontology concepts and instance data, if available, e. g., *current location (Dresden)*
  - » capabilities are displayed via human-readable phrase, e. g., *search a route*
- If a user selects a specific r_0, labels of connectable capabilities are adapted to clarify cause and effect
  - » thereby all r_i and r_j are treated differently
  - » trailing or leading dots helps to clarify the



reading sequence

Reconfiguration of Mashups

- Connectable capabilities can be combined using drag & drop
  - » options in case of ambiguous mapping
- Automatic and transparent implementation of connections in terms of composition model concepts by the platform
- Recommendation menu lists capabilities of components not part of the mashup yet

Technische Universität Dresden
Fakulty of Computer Science
Senior Chair of Multimedia Technology

Project website
http://mmt.inf.tu-dresden.de/edyra/

Project members
Carsten Radeck
carsten.radeck@tu-dresden.de

Dr.-Ing. Alexander Lorz
alexander.lorz@tu-dresden.de

Gregor Blichmann
gregor.blichmann@tu-dresden.de

André Lorenz

Project lead
Prof. Dr. Klaus Meißner
klaus.meissner@tu-dresden.de

MMT