Towards Ontology-driven Composition of Personalized Mobile Services by End-users
Rune Sætre¹, Mohammad Ullah Khan², Erlend Stav³, Alfredo Perez Fernandez¹, Peter Herrmann², and Jon Atle Gulla¹

¹ Computer and Information Science (IDI) NTNU, satre@idi.ntnu.no, ² Telematics (ITEM) NTNU, 7491 Trondheim, Norway
³ Information and Communication Technology (ICT), SINTF, 7031 Trondheim, Norway

ABSTRACT
Starting with a number of real life scenarios we have been working towards supporting end-users in managing their services in an efficient and user-friendly manner. We observe that these scenarios consist of sub-tasks that can be solved with collaborative service units. Therefore, a composition of such service units will serve the needs of the end-user for the complete scenario. We envisage that a visual formalism and tools can be developed to support these end-users in creating such service compositions. Moreover, methodologies and middleware can significantly reduce the complexity of developing composite services.

Ontologies can assist the users in selecting appropriate services and setting composition parameters within a composition tool. For our prototype demonstration system we target the open source Android cell-phone architecture supporting a number of different runtime platforms.

Scenario: guiding a tourist in a city

• A tourist wants to visit interesting places in a city between a business meeting and the check-in time at the airport
• Based on the information provided in the composition related to her time schedule, cost allowance etc. she is guided to a tour at a cathedral or at a museum or at a cinema. The transportation means are also selected based on the composition.

Architecture and the need for an ontology

UbiSys
UbiComp PRO
UbiComposer
UbiCompRun

• UbiComposer is a web browser-based tool developed to support composing service building blocks
• A meta-model describes a 'simple language' to express service compositions
• Uses a set of end-user-friendly notation that corresponds to the simple language meta-model
• Composition is done in a scenario-like fashion
• Ontologies are used to:
  o Discover building blocks
  o Glue building blocks; automatically determining the dependencies
• The composed scenarios are selected based on the conditions evaluated at runtime
• User needs may change at runtime; i.e., the application may be recomposed at runtime
• Alternative scenarios and services can serve the same purpose

• Ontologies can be used in identifying and selecting from alternative scenarios and services that serve the same composition and the same building block, respectively

OTHER SCENARIOS
• Incoming call handling
• Doctor’s appointment
• Advertisement

RESULTS

Domain Ontology for the city guide scenario

• Entities, concepts and their relationships are derived from the example scenario
• This knowledge (ontology) is used by UbiComposer and UbiCompRun to compose and evaluate the quality of all your graphics before you submit your poster for printing.

REFERENCES

ACKNOWLEDGEMENTS
Funded by:

The Research Council of Norway