

An ANSI C Ontology Library Generator for the Smart-M3 Platform



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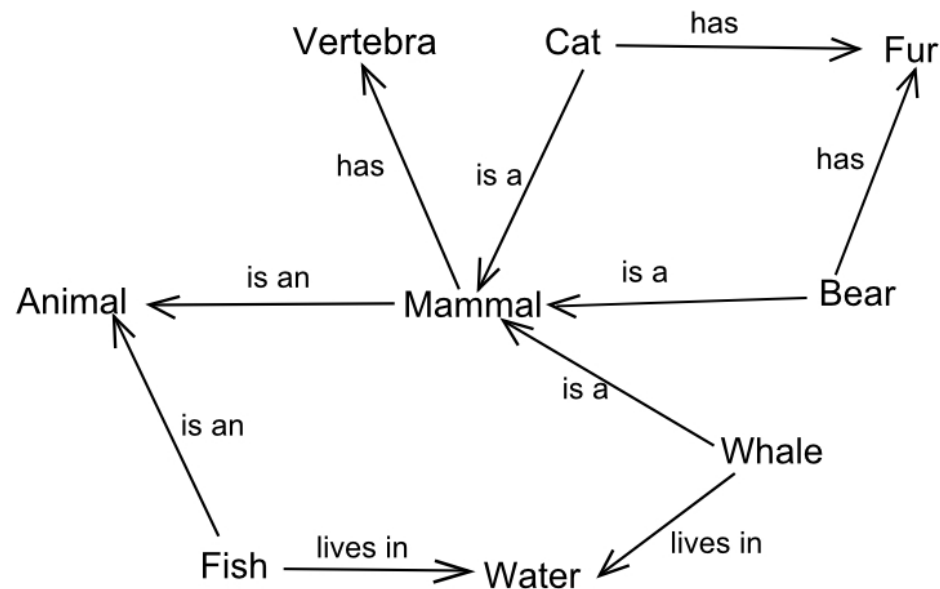
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Semantic network and Semantic Web

Semantic network

Knowledge representation with semantic relations among concepts as a directed or undirected graph

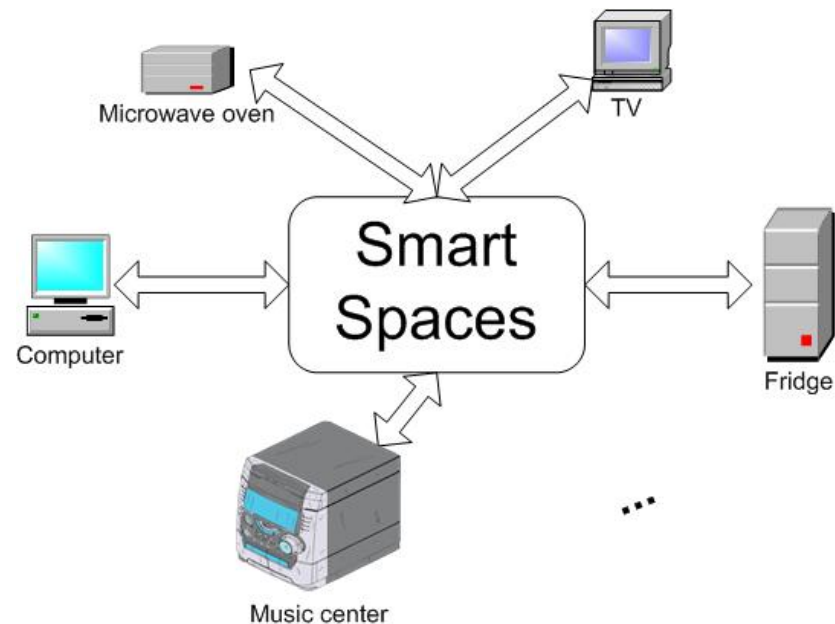


Semantic Web

Global concept of the WWW development that assumes processing distributed knowledge in accordance with the semantic content

Smart Spaces

Push-based information sharing model
rather than specific publish-subscribe model



Agents run on ubiquitous devices implementing the push-based model
(in terms of Smart Spaces)

Smart-M3 (Nokia) is an experimental platform for Smart Spaces



Examples of applications

1. Meetings and conferences

(Ian Oliver, Esko Nuutila, Seppo Torma. Context gathering in meetings: Business processes meet the Agents and the Semantic Web. 2008)

2. Concept «Smart Home»

(Kary Främling, Ian Oliver, Jukka Honkola, and Jan Nyman. Smart Spaces for Ubiquitously Smart Buildings. UBICOMM 2009)

3. Social Networks

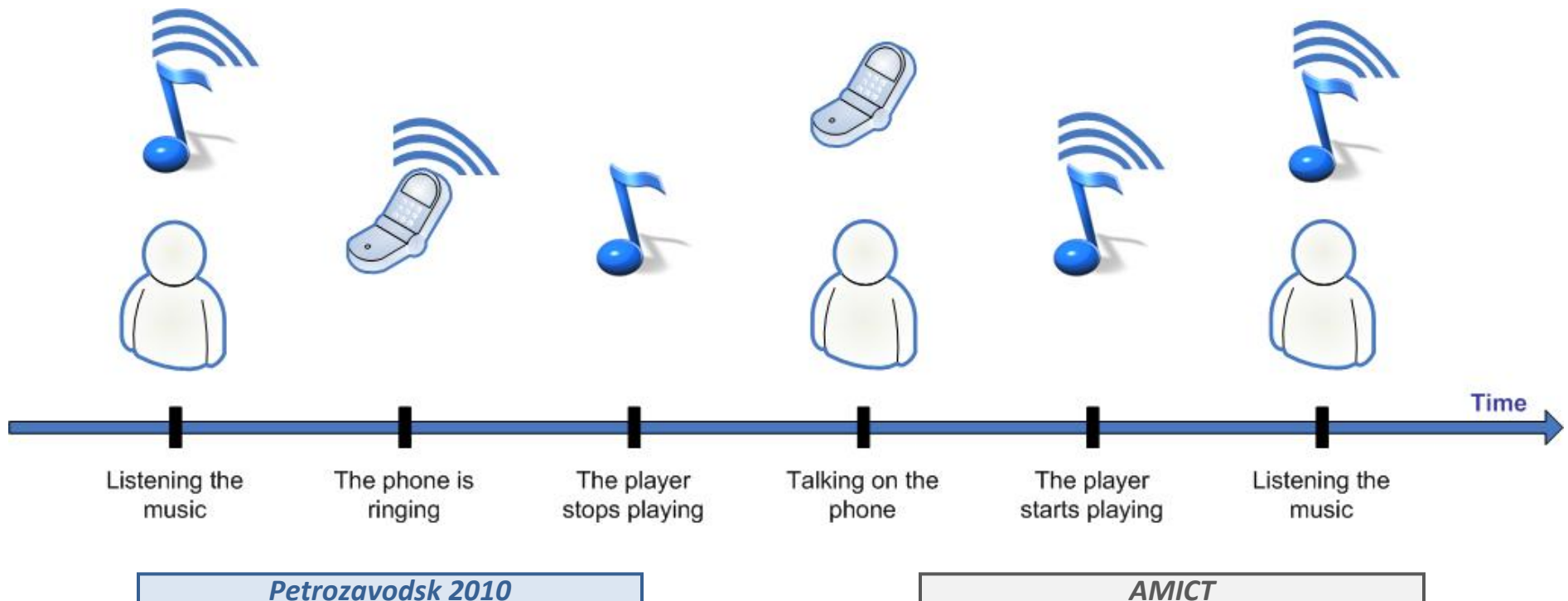
(Sergey Balandin, Ian Oliver, and Sergey Boldyrev . Distributed Architecture of a Professional Social Network on Top of M3 Smart Space Solution Made in PCs and Mobile Devices Friendly Manner. UBICOMM 2009)



Examples of our development

- ✓ Hello world
- ✓ Simple Drinkers
- ✓ Extended Drinkers
- ✓ Calendar
- ✓ Music center

Example of music center:





SmartSlog Project

Developing an ANSI C Library Generator for Smart-M3:
mapping an OWL ontology description to C code

Ontology is a formal description of semantic networks with classes, properties and relations (*OWL, RDF, ...*)

The project is included to the FRUCT program (<http://fruct.org/>)
In collaboration with Nokia Research Center (Helsinki)



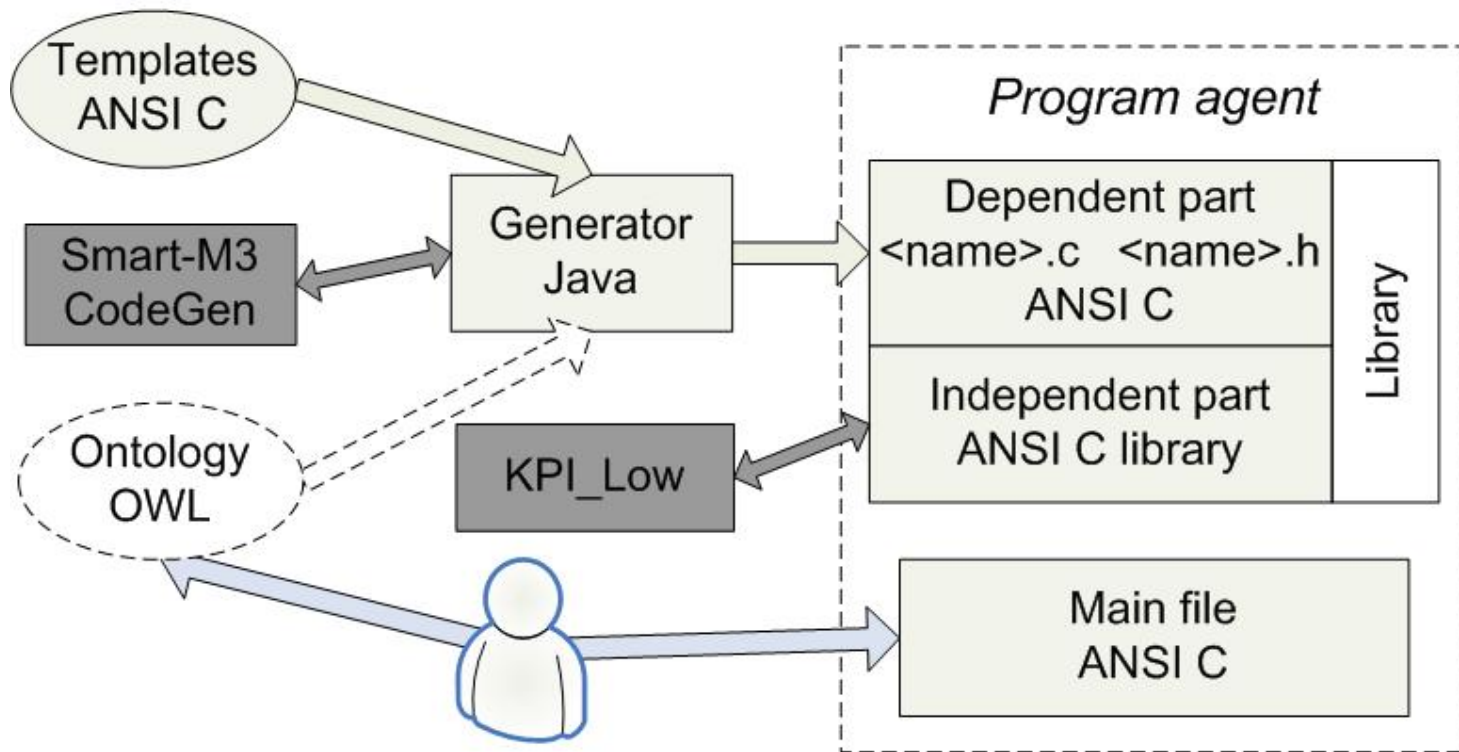
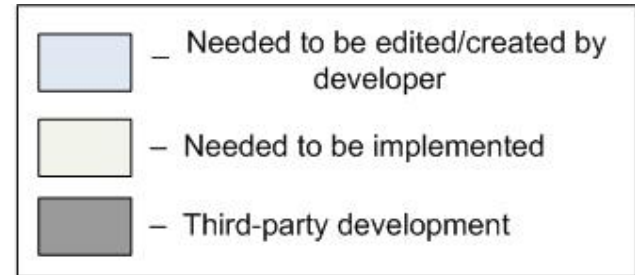
Main advantages

In contrast to existing technologies

1. The paradigm *Smart Spaces* exploits the concept of **distributed information sharing** with producing **new knowledge** based on existing information (reasoning)
2. The code generation simplifies developing and testing of agents: they are implemented in **high-level terms of the ontology**
3. SmartSlog agents can work on **embedded** and **low-performance devices**

Architecture

1. Library (ANSI C)
 - Dependent on ontology part
 - Independent from ontology part
2. Generator (Java)
3. Templates (ANSI C with tags)





Demonstration

Drinkers

Agent “Timo” publishes the number of liters Timo has drunk. Also it subscribes to SMS from Timo’s wife.

Agent “Timo's wife” subscribes to the number of liters for monitoring Timo’s being in the bar

When Timo has drunk 5 liters or more his wife sends SMS to the Smart Space notifying that Timo should go home

Scenarios:

1. Standard scenario
2. Timo’s agent wouldn’t subscribed to SMS from wife
3. Wrong phone number



Thank you for your attention

Project is published: <http://sourceforge.net/projects/smartslog/>

Bug report: <http://oss.fruct.org/bugzilla/>

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