Model Driven Realization of Business Processes in Care Paths Based on a Service-Oriented Architecture in a Hospital Infrastructure

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Abstract

This presentation will share work from my ongoing master thesis.

At Ullevål University Hospital there is a major challenge in integrating different IT systems in core processes, i.e. patient treatment.

The challenge is a two-way street. It is hard to embed these systems in the treatment processes (care paths) giving optimal value for patients, clinicians and the hospital. Treatment processes are not straightforward and the systems need to be flexible to align the processes.

At the same time complexity is emerging as a result of the way the systems are integrated. New technologies come and go, increasing heterogeneity and lowering flexibility in the way these systems interacts.

The focus in the master thesis is on realizing flexible computer-support in business processes by using concepts from OMG's MDA framework and investigating the use of BPMN and BPEL in this context. The use of reference ontologies are also investigated.

Keywords:

Integration, Model Driven Architecture, Service-Oriented Architecture, Modeling Language, BPEL, BPMN, Ontology, Logistics, Interoperability, Sustainable Development.

Introduction

In my master thesis I will investigate the framework of Model Driven Architecture (MDA) and Service-oriented Architecture (SOA) with the intention to realize flexible system integration aligned with core processes.

The main objective is to find a suitable modeling language(s) to map business processes to IT-infrastructure. Business processes, e.g. treatment processes and care paths, will be captured and used as input to a computational independent model in MDA.

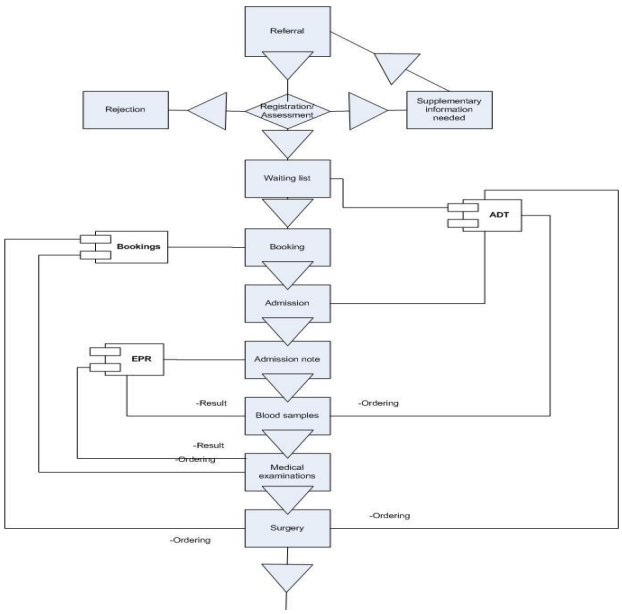

Figure 1- A subset of the treatment process

Methods

The capturing of business processes will be done by conducting structured interviews at a hospital department and modeled informally by the use of simple flow charts. Methods used to capture this and the results are not evaluated.

The captured business processes are modeled in BPMN. Further, models for realizing service chaining and service oriented architecture are made. A platform specific model conforming to BPEL metamodel is made in an attempt to realize service chaining using a specific technology.

Mappings between models are made experimentally revealing the abstraction levels that are needed.

An ontology is also made conceptually and mapped to the MDA stack.

Discussion

In the discussion, the BPMN-BPEL-chain, reference ontologies and the MDA framework is evaluated, raising the following questions:

- What is lost in abstraction to the different technologies?
- Are the technologies suited for integration of health information systems?
- Do the technologies fit into the MDA framework?
- Where do reference ontologies fit in the MDA framework and how should it be realized in a hospital setting?
- How should a reference ontology for semantic mappings of clinical and organizational data in EDI standards, like EDIFACT and HL7, be realized and what are the profits to expect?
- Identifying pitfalls in realization of the conceptual frameworks?

Results and Conclusion

The master thesis is due August 2008.