

Virtual factory for smart city service integration

PhD Proposal
MAP-I 2013-14
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1. Motivation

- Better lives for city inhabitants mean better public services
- ICT enables improvements in public service delivery through better accessibility to all segments of the society, and higher customization to meet individual needs
- The task of digitizing many existing public services one-by-one is daunting
- There is lack of technical and managerial capacity for transforming public services from traditional to electronic modes of delivery, particularly at the local government level
- Although a larger number of city-level public services exist, many of them are slight variations of major instances of public service families, and amenable to delivery through standardized processes and procedures

2. Goals

The aim of this PhD proposal is to propose a new approach (Virtual Factory for Smart City Service Integration) to development of city-level electronic public services, to validate this approach through real-life cases and to demonstrate concrete improvements with respect to existing development methods.

The goals are:

- To assess existing approaches to developing city-level electronic public services

- To identify a broad family of city-level electronic public services with high value for city inhabitants and amenable to delivery through a common set of business processes
- To develop a public service description model that captures uniform delivery of all services in this family by executing the corresponding processes
- To design a public service domain specific language to capture syntactically all variations in the chosen service family using the model above as operational semantics
- To build a prototype software platform to implement the defined public service domain specific language including a visual interface for non-technical users.
- To validate the approach on cases of real-life city-level public services.
- To demonstrate improvement between traditional development and development through the Virtual Factory approach.

3. Work Topics

Computer Science:

From the theoretical (Computer Science) perspective, this PhD project will resort to modeling techniques and specification languages, to be chosen at a latter stage. The project will contribute to the development of a Domain Specific Language encompassing different levels (namely, modeling, programming and rendering), and its assessment with respect to the specification of functional, non functional and dependability requirements. Techniques for workflow analysis (possibly in combination with process mining) and management will also be in order.

Electronic Governance:

From practical perspective (Electronic Governance) the following topics will be addressed:

- Public service ontology [7][8]
- Electronic public services [10][11][12]
- Infrastructure for electronic public services [13][14]
- Technical, semantic and organizational interoperability [9][15][16]
- Smart City service integration [1][2][3][4][6]

4. Context

Research Units:

- HASLab INESC TEC
- UNU-EGOV

Supervisors:

- Luis S. Barbosa, HASLab INESC TEC
- Elsa Estevez, UNU-EGOV

External member for the Monitoring Committee:

- Marijn Janssen, Technical University of Delft, Netherlands

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