

IS Project (Master): Smart City Architecture Principles

Introduction

Recent global and societal changes with increasing urbanization, ubiquitous environmental problems and new expectations for public services and efficiency present modern cities with different challenges. At the same time, digital technologies and current trends such as Big Data, Industry 4.0 and the Internet of Things (IoT) are paving the way for intelligent cities.

Considering the above, some city governments aim to make their city more efficient, sustainable and social (or participatory). Additionally, the quality of life of citizens should be increased. Consequently, the concept of *Smart City* (SC) has received increasing attention in both research and practice, eventually providing a new dimension to ICT's role in urban environments (Hollands, 2008, p. 303; Nam and Pardo, 2011a, p. 283; Alawadhi et al., 2012, p. 40). Developing SC solutions often requires complex collaboration between diverse organizations and systems. Given that SC initiatives face certain challenges comparable to those of traditional enterprises, existing SC architectures are often to some extent based on generic enterprise architecture (EA) frameworks which could direct and guide a city's digital transformation (Mamkaitis et al., 2016a, p. 1; Bastidas, Bezbradica and Helfert, 2017, p. 1). *Architecture Principles* can be seen as the cornerstones of Enterprise Architecture, as they fill the gap between high-level strategic intent and concrete design (Greefhorst and Proper, 2011).

Contribution and Tasks

The Chair of Information Systems and Strategic IT Management (SITM) offers an IS project about architecture principles for smart cities. The aim of this IS project should be the evaluation and comparison of architecture principles in different smart city initiatives. The architecture principles developed for and used by the Smart City Duisburg initiative will serve as a starting point. In cooperation with the supervisor, around ten smart cities in Germany will be selected. Through semi-structured interviews with SC representatives of the respective cities and document analyses, an

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overview of the current state of the art of Smart Cities in terms of architecture principles will be established. The responders will also be asked to give their opinion on the proposed principles in Duisburg and to what extent these would apply and benefit their own SC initiative. Thus, the project will not only provide a profound analysis of the current architecture as well as their requirements but also findings about how the principles of Duisburg compare to the needs and context of different cities. Based on these insights, managerial recommendations and potentially a standardized approach for the development and establishment of architecture principles in smart cities could be proposed.

Evaluation

The detailed grading criteria will be presented during the first project meeting before you as students formally register for the module. In an overview, the grading consists of the following:

1. **70% of final grade: Research/project report** including project introduction, theoretical foundations, research approach, results, discussion, conclusion, as well as IS project learnings and self-reflection. This report is a Word document, of approximately 60 pages (excluding cover page, table of contents, appendices, etc.), depending on the number of students.
2. **30% of final grade: A slide presentation** of the project results. This part of the grading is based on your PowerPoint (or similar software) presentation, meaning the actual submitted slides and content within your presentation. This grading does not include the verbal delivery of the presentation. That said, if permitted by the guidelines relating to the Coronavirus epidemic, we will schedule an (ungraded) verbal delivery of the presentation as well.

Application

Interested master students (or groups of students) can apply for this project by submitting

1. your *current grade transcript* and
2. a *brief text* (no longer than 2-3 sentences) describing why you are interested in this project

no later than 29.05.2020.

Please send your application including the relevant documents via email to **Peder Bergan** (peder.bergan@uni-due.de) using the subject **Smart City IS project summer 2020**. Please indicate whether you are applying as part of a group of students in your cover letter. Shortly after the submission deadline you will receive information via email about your acceptance and the date of the initial kick-off meeting for this project.

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