Chapter XV

A Formalized Design Method for Building E-Government Architectures

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ABSTRACT

E-government has the main goal of simplifying governmental processes and the interaction between citizens and state organizations. It therefore has to solve the problem of efficient and secure electronic exchange and processing of governmental documents and data across administration domains and boundaries, even crossing country borders. This is a difficult task that imposes a strict set of requirements to the design and modelling of e-government systems and demands the application of standardized architectural frameworks. This chapter demonstrates how the ISO/RM-ODP, in combination with the UML notation, supports the design and development of an open distributed e-government system, by addressing these requirements. It further presents a high-level case study of how RM-ODP has been applied in the case of the e-mayor platform to build a system supporting cross-border transactions between small to medium sized European municipalities.

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INTRODUCTION

During the last decade, governmental organizations at all levels have invested considerable effort and financial resources in the development and adoption of e-government services.

E-government aims to simplify governmental processes and improve the interaction between citizens and state organizations through the use of electronic communications. The first era of e-government activities included Web site hosting and management. The more sophisticated of these efforts even allowed a limited transaction to be performed online. The next generation of e-government applications demand interactive service delivery, secure transactions, cross-border interactions, and a homogenous framework for e-government systems communication. In order to sustain the quality of their services, governmental organizations need to solve the problem of efficient and secure electronic exchange and processing of governmental documents and data. It is of utmost importance that these services are provided in a way that is easily adoptable and accessible by all citizens, businesses, and other public bodies.

Since public organizations may be distributed within a small area (e.g., a town hall and other municipal offices) or a larger one (across a wider geographical area—even across country boundaries), they need distributed system architectures. The development of an e-government distributed processing system needs to first have a clear understanding of the functionalities to be offered and then represent and structure the system’s fundamental information in a way that will be effective and efficient in the final implemented system.

This is a difficult task that imposes a strict set of requirements to the design and modelling of e-government systems and demands the application of standardized architectural frameworks. This chapter demonstrates how the ISO Reference Model for Open Distributed Processing systems (RM-ODP) standard, in combination with the UML notation (OMG–UML, 2004), can support the design and development of an open distributed e-government system. It further presents a high-level case study of how RM-ODP has been applied in the case of the e-mayor platform to build a system supporting cross-border transactions between small- to medium-sized European municipalities.

The chapter is structured as follows: “Related Work in the Area of Architecture Modeling for Distributed Systems” gives a presentation of related work in the field of modelling frameworks for IT architectures. “Architectural Requirements of E-Government Systems” presents the specific requirements of governmental organizations that have to be addressed by a system architecture tuned to this environment. “An Overview of the RM-ODP Standard” gives an overview of the RM-ODP standard and presents its fundamental characteristics. “Suitability of RM-ODP for E-Government” shows how RM-ODP and its features fulfil these requirements. “The e-Mayor Case Study” presents a high-level case study of how the RM-ODP standard is being used for the design of a system targeting municipalities and, finally, the section “Conclusion” draws conclusions.