# Chapter 64
# Systems Administration in Ontology-Based Applications: The Case of Citizen Relationship Management

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## ABSTRACT

*A Citizen Relationship Management (OpenCiRM) system was built on a semantic web platform using model-driven development principles, to provide a government call center with operational agility and improved technical integration options. Business domain experts from municipal agencies administered the system by directly manipulating its ontology model. This paper highlights the new ontology engineering tasks and user roles that may emerge in organizations implementing the OpenCiRM system.*

DOI: 10.4018/978-1-5225-5191-1.ch064

## INTRODUCTION

Public sector organizations are faced with a two-fold mandate – they must improve customer service, but also keep lowering their operational costs, and their burden on taxpayers. IT applications are often seen as the solution to meet both requirements. Customer Relationship Management technologies are being used in industry to improve account management, increase knowledge about the customer, generate sales leads, and promote customer loyalty through personalized service interactions (Chen & Popovich, 2003). In the case of government agencies, such technologies reflect a non-commercial orientation with an emphasis on soft goals such as citizen satisfaction, transparency, and non-revenue generating processes, like reporting incidents and problems, assistance with payments, permits, forms and applications, as well as general informational inquiries. The term Citizen Relationship Management - CiRM - was coined to emphasize these distinctions (Schellong, 2008).

Customer Relationship Management applications are traditionally monolithic software suites that provide configuration options to accommodate different business practices, data requirements and workflows (Davies et al., 2008). Government agencies' customization requirements, however, are usually extensive (Scholl, 2006), and they often transcend the options available in commercial off-the-shelf (COTS) software. As a result agencies could incur substantial expenses when procuring and implementing such solutions.

The open source Citizen Relationship Management platform described herein, represents an alternative approach to large-scale commercial enterprise off-the-shelf software suites with a proprietary, closed system model, as it combines model-driven with semantic data representation. This exploratory approach was adopted as part of an effort to fulfill complex municipal call center operational requirements while minimizing implementation and maintenance cost. Apart from such costs, the administration of systems that support business operations constitutes a significant workload and operational bottleneck, as well, as it typically requires IT personnel to make and enable changes. When multiple departments or agencies are users of the same system, the complexity of such changes increases, as the potential for impact of one agency's change to another's operations is significant. Furthermore, a significant portion of agencies' customization requirements involve changes to the graphical user interface (GUI) of the system.

Given their openness, level of adoption and relative simplicity, Semantic Web technologies are well-suited to enable modularization, interoperability of cross-jurisdictional systems and integrations with legacy applications (Devedzic, 2002). Furthermore, the use of a model-driven approach also holds promise for large-scale systems such as CiRM tools in the public sector, as it has the potential to enable organizations to be more adaptive to business process changes by modifying their systems' configurations and interfaces faster, and with greater ease (Brown, 2004). While the system architectures introduced by Semantic Web applications offer technical novelty and promote flexibility, there is not enough focus on ontology engineering approaches in government (Fonou-Dombeu & Huisman, 2011). How business users administer Semantic Web-based tools and systems in the day-to-day operations of their agencies, is therefore a topic of great interest, as such applications are still in their infancy and have yet to become more prominent in the toolboxes of government organizations (Janev & Vranes, 2009).