

# Chapter 20

## Symbiotic Aspects in e-Government Application Development

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### ABSTRACT

*For e-Government applications, the symbiotic aspect must be taken into account at three stages: at design time in order to integrate the end-user; at delivery time when civil servants have to discover and interact with new services, at run time when ambient intelligence could help the interaction of citizens with specific services. In this paper, we focus on the first two steps. We show how interoperability issues must concern application designers. We also present how semantics can help civil servants when they have to deal with e-government service frameworks. We then describe an actual application developed during the European Terregov project where semantics is the key point for simplifying the role of citizens when requesting for health care services.*

### SYMBIOTIC ASPECTS IN E-GOVERNMENT APPLICATION DEVELOPMENT

According to the definition given in the Symbiotic Computing website<sup>1</sup>, “Symbiotic computing is a basic idea that achieves an information processing environment, which autonomously supports hu-

man activities, by understanding human behavior and sociality in the real world.”

Initiatives occurring inside the e-Government domain can contribute to some aspects of this definition. Research in the area of e-Government combines the information and communication technology in public administrations with organizational changes and new skills in order to improve public services and democratic processes, and to strengthen support to public policies. The

DOI: 10.4018/978-1-4666-0264-9.ch020

potential of e-Government goes far beyond the early achievements of online public services. New public services are user-centered and aim to support the interaction between citizens and administrations. They generally take into account the social profile of people, and try to deliver the most accurate information that citizen is looking for, or the most appropriate services that the citizen can benefit from. This is particularly true in the social and health care domains.

When dealing with public services, two levels have to be considered: (i) the discovery of the services that citizens can benefit from, and (ii) the enactment of such services. The first level deals with the selection of services, based on capabilities and/or constraints; it is an area of on-going research, and for example, travelers who are confronted with foreign Public Administrations could benefit of results in this domain. The second level deals with the execution of selected services. New technologies like ubiquitous middleware technology could be effectively employed for simplifying the access to some service functionalities. For example, physically impaired people can highly benefit from the use of intelligent mobile devices capable of seamlessly interacting with distributed computational units embedded in the environment (ubiquitous computing). At both levels human society and digital space interact with each other using different kind of technologies.

Developing user-centered applications and frameworks requires symbiosis among several actors at design times: project managers, domain experts, human-machine interaction experts, design experts and end-users. Particularly in the e-Government domain a better symbiosis between civil servants and systems actually delivering services is highly desirable. Civil servants can be considered as a Community where usual hierarchy disappears. One issue is the emergence of new roles based on new knowledge and has been identified with the so-called “social-ware” technologies (Hattori et al., 1999).

From the perspective of cognitive informatics, delivering new e-Government services requires the convergence of several research domains. The socio-economic research studies many cases in Europe and all over the world to determine the criteria of their success or failure. It produces guidelines useful to follow. A new e-Government also requires the definition of new processes and a better integration of citizens’ and civil servants’ behaviors. Finally, knowledge representation (ontologies) is the core of new semantic technologies and allows systems to perform symbolic reasoning.

The work presented in this paper is based on the results of the Terregov research project: “Impact of e-Government on Territorial Government Services” (Terregov, 2008). A platform has been developed in which semantics combines with more traditional technologies in order to enable new capabilities and to overcome technical and cultural challenges. The design and development of this e-Government Semantic Platform has been conducted with the financial support of the European Commission. The goal of this platform is to let local government and government agencies offer online access to their services in an interoperable way, and to allow them to participate in orchestrated processes involving services provided by multiple agencies.

## **IMPLEMENTED SCENARIO**

For a better understanding of the concepts analyzed in this paper, we first present a scenario that was implemented with the collaboration public administration of the Venice Region in northern Italy. Public Administrations (PA) offer a number of services for citizens in the area of social-care and health assistance for elderly and physically/mentally impaired people. The main use case is the following. A citizen asks for some assistance service; a civil servant receives the request and assembles the citizen profile (a set of relevant information about the citizen making the request);

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