Chapter 1.16
A Fundamental SOA Approach to Rebuilding Enterprise Architecture for a Local Government after a Disaster

Zachary B. Wheeler
SDDM Technology, USA

ABSTRACT

As a result of Hurricane Katrina, the destruction of property, assets, documentation, and human life in the Gulf Port has introduced a myriad of challenging issues. These issues involve human, social, government, and technological concerns. This chapter does not address the many immediate human and social concerns brought forth from a natural disaster or major terrorist attack (NDMTA); this chapter addresses a small but significant problem of re-establishing or laying the groundwork for an enterprise architecture for local government during the response phase of the disaster. Specifically, it addresses constructing a high-level data model and fundamental SOA, utilizing the remaining local assets, XML (extensible markup language), and Web services.

DOI: 10.4018/978-1-60566-330-2.ch015

INTRODUCTION

Disaster preparedness, response, and recovery received a lot of attention immediately after the terrorist attacks of 9/11 and eventually faded from the forefront of attention after the invasion of Iraq and the global war on terrorism. However, recent natural disasters such as the Indonesian Tsunami in 2004 and the devastating Hurricane Katrina in Louisiana have refocused attention on these three prominent areas. Specifically, the lack of preparedness, inadequate response, and slow recovery has burdened local, state, and federal governments as well as citizens.

The presented enterprise approach and implementation process covers an area that is void in the disaster preparedness and response phase; however, it is applicable in each phase: preparedness, response, and recovery. It is recommended that the presented approach be included as part of the disaster preparedness phase, implemented in the response phase, and eventually expanded in the recovery phase. The approach is unique because the enterprise implementation takes place during the actual response phase of the disaster and utilization of the fundamental SOA leads to further expansion during and after the recovery phase.

The approach introduced in this chapter takes advantage of the Zachman framework system model perspective by utilizing Web services on a local level and introducing a practical but efficient method for populating the initial data model. A series of basic assumptions are introduced based on information regarding the recent Gulf Port, Hurricane Andrew, Indonesian Tsunami, and 9/11 disaster events. These assumptions are based on the physical, environmental, and technological conditions immediately after disaster strikes. The assumptions are there will be limited or nonexistent landline and wireless communication, a lack of ability to use generators for power source, limited or nonexistent Internet and intranet, major IT system destruction, and the incapacitation of local government services.

This chapter addresses the problem of reestablishing or laying the groundwork for an enterprise architecture for local government during the response phase of the disaster. Specifically, it addresses constructing a high-level data model and fundamental SOA by utilizing the remaining local assets, XML, and Web services.

BACKGROUND

The fundamental role of local government is to protect the people, provide basic human services, and assist in strengthening communities. This is typically accomplished by establishing various local agencies and departments. These departments are structured to provide essential services for the community. For instance, the fire department role is to help citizens in immediate danger due to fire, gas, or chemical hazard. The role of the health department is to establish policy, programs, and standards regarding health and health related issues. An additional role of the health department is to assist citizens in obtaining basic health care services. Each established department or agency has a role in assisting the community and its residents by providing relevant services. In a typical municipality, each agency has a database of information relating to the citizens and the services provided to the citizen by the agency. For instance, the police department maintains a database of criminals, criminal activity, and citizen complaints. The Department of Human Services maintains a database of child immunization records. In short, each agency maintains a database and application system to enter data, process data, and execute business rules. However, in the wake of an NDMTA, these systems along with other IT assets are destroyed or rendered useless. For instance, Hurricane Katrina destroyed most of New Orleans including property, buildings, human life, landline and mobile communications, Internet services, intranet services, and essentially incapacitated local government. In the terror attacks of 9/11, the same asset destruction was prevalent within a specified geographic area. Hurricane Andrew wreaked havoc among Florida communities and followed the same line of asset destruction and local government incapacitation as Hurricane Katrina. In each of these cases, major response and rebuilding were needed to help reestablish public safety, government, and services to the remaining citizens. This approach suggests that reestablishing a basic framework for IT services can be facilitated during the response phase of a disaster. In that regard, the proposed approach is unique in that the role of rebuilding typically takes place during the recovery phase (University of Florida, 1998).