Chapter 47
Geospatial Technology-Based E-Government Design for Environmental Protection and Emergency Response

Tianxing Cai
Lamar University, USA

ABSTRACT

Fast development of geospatial technologies has made it possible to integrate existing user operational information and value-added services in a single harmonized infrastructure. This has made it possible to utilize geospatial technologies in the e-Government context. The emerging technologies have made it possible for natural disaster monitoring and mitigation for early warning in order for effective actions under emergency situation, such as natural disaster and chemical accident, to be taken. Natural disasters may include fires, explosions, leakages, or releases of toxic or hazardous materials that can cause people illness, injury, disability, or death. With emerging geospatial technology capabilities and applications such as Google Earth, GIS, and GPS, computer modeling and simulation can provide the inverse identification of emission profile and location. The modeling result can further present the forward prediction of the likely impact of any disaster event. Therefore, the community can acquire the situation in time to form spontaneous emergency response planning, which will also help the other stakeholders such as government and responsible community team. This modeling tool can form a virtual e-Government solution requisite for effective monitoring and mitigation. This chapter highlights the current research trends and future prospects with regards to integrating technologies for managing spatio-temporal information with e-Government conceptualization.

INTRODUCTION AND BACKGROUND

E-Government research is becoming a hot topic in many governments in the world. According to the definition from United Nations Department of Economic and Social Affairs, "E-Government' (or Digital Government) is defined as 'The employment of the Internet and the world-wide-web for delivering government information and services to the citizens.'(UNDESA, 2012). E-Government should enable

DOI: 10.4018/978-1-4666-9845-1.ch047

anyone visiting a city website to communicate and interact with city employees via the Internet with graphical user interfaces (GUI), instant-messaging (IM), audio/video presentations, and in any way more sophisticated than a simple email letter to the address provided at the site" (Deloitte Research, 2000). And "the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees" (

Transparency and Open Government, 2012). The e-Government has traditionally been understood as being centered on the operations of government, e-Governance is understood to extend the scope by including citizen engagement and participation in governance. As such, following in line with the OECD definition of e-Government, e-Governance can be defined as the use of ICTs as a tool to achieve better governance.

E-Government describes the use of technologies to facilitate the operation of government and the dispersion of government information and services. It deals heavily with Internet and non-Internet applications to aid in governments. By the application of electronics in government as large-scale as the use of telephones and fax machines, as well as surveillance systems, tracking systems such as RFID tags, and even the use of television and radios to provide government-related information and services to the citizens.

In the USA, the Office of E-Government and Information Technology (E-Gov), headed by the Federal Government's Chief Information Officer (CIO), develops and provides direction in the use of Internet-based technologies to make it easier for citizens and businesses to interact with the Federal Government, save taxpayer dollars, and streamline citizen participation (Brown, 2003).

The ever-increasing dominance of ICTs in human lives cannot be overemphasized as seen in President Barack Obama regarding the same: "I want us to ask ourselves every day, how are we using technology to make a real difference in people's lives." On January 21, 2009, newly elected President Obama signed one of his first memorandums – the Memorandum for the Heads of Executive Departments and Agencies on Transparency and Open Government. In the memo, President Obama called for an unprecedented level of openness in Government, asking agencies to "ensure the public trust and establish a system of transparency, public participation, and collaboration". The memo further "directs the Chief Technology Officer, in coordination with the Director of the Office of Management and Budget (OMB) and the Administrator of General Services (GSA), to coordinate the development by appropriate executive departments and agencies and to take specific actions implementing the principles set forth in the memorandum." (Shailendra, Jain, & Sushil, 2007).

Recent government policy updates have seen a shift away from e-Government towards a much more radical focus on transforming the whole relationship between the public sector and users of public services. This new approach is referred to as Transformational Government. Transformation programs differ from traditional e-Government programs in four major ways: they take a whole-of-government view of the relationship between the public sector and the citizen or business user; they include initiatives to e-enable the frontline public services: that is, staff involved in direct personal delivery of services such as education and healthcare – rather than just looking at transactional services which can be e-enabled on an end-to-end basis; they take a whole-of-government view of the most efficient way managing the cost base of government; they focus on the "citizen" not the "customer". That is, they seek to engage with the citizens as owners of and participants in the creation of public services, not as passive recipients of services. With the continuous development of the primary delivery models of e-Government, it can thus be divided into: Government-to-Citizen or Government-to-Consumer (G2C),Government-to-Business (G2B), Government-to-Government (G2G) and Government-to-Employees (G2E). Within each of these