Chapter V
Stages of E-Government Interoperability

1. STAGES OF E-GOVERNMENT INTEROPERABILITY

Improved interoperability between public organizations as well as between public and private organizations is of critical importance to make electronic government more successful (Pardo & Tayi, 2007; Wang, Song, Hamilton, & Curwell, 2007). The mobilization of electronic information across organizations has the potential of modernizing and transforming information exchanges. The current information exchanges are, however, often inefficient and error-prone (Eckman, Bennet, Kaufman, & Tenner, 2007). Exchanges of information and services are fragmented and complex, dominated by technical as well as organizational problems. High-ranking issues among the defining purposes of e-government are highly agile, citizen-centric, accountable, transparent, effective, and efficient government operations and services (Scholl & Klischewski, 2007). For reaching such goals, the integration of government information resources and processes, and thus the interoperability of independent information systems are essential. Yet, most integration and interoperability efforts meet serious challenges and limitations.

The purpose of this chapter is to develop a stage model and maturity levels for interoperability in digital government. By identifying development stages, scholars and practitioners have a framework within which they can diagnose the current
situation and plan for future improvements in interoperability. Specifically, the objective of this conceptual and exploratory chapter is an attempt to identify issues and to develop models for interoperability based on maturity levels.

### 1.1 Stage Models in Organizational Studies

Stages of growth models have been used widely in both organizational research and management practice. According to King and Teo (1997), these models describe a wide variety of phenomena—the organizational life cycle, product life cycle, biological growth, change management, etc. These models assume that predictable patterns (conceptualized in terms of stages, levels or phases) exist in the growth of organizations, the sales levels of products, IT maturity, and the growth of living organisms. These stages (1) are sequential in nature, (2) occur as a hierarchical progression that is not easily reversed, (3) evolve a broad range of organizational activities and structures, and (4) are dependent on contingent actions at each stage to progress to the next stage.

Organizational stage models suggest that organizations follow certain steps into higher levels as they evolve and develop. The assumption is that organizational evolution is upward and sequential. In particular, these models suggest that the challenges and requirements for organizational success vary with different stages, and thus, organizational actions must change as the stages change (Pfarrer, Decells, Smith, & Taylor, 2008).

Benchmark variables are often used to indicate characteristics at each stage of growth. A one-dimensional continuum might be established for each benchmark variable. The measurement of benchmark variables can be carried out using simple Likert scaling or more advanced Guttman scales (Frankfort-Nachmias & Nachmias, 2002). Guttman scaling is a cumulative scaling technique based on ordering theory that suggests a cumulative relationship between the elements of a domain and the items on a test.

Various multistage models have been proposed for organizational evolution over time. For example, Nolan (1979) introduced a model consisting of six stages for information technology maturity in organizations, which later was expanded to nine stages by other researchers. Earl (2000) suggested a stages of growth model for evolving the e-business in both private and public enterprises, consisting of the following six stages: external communication, internal communication, e-commerce, e-business, e-enterprise, and transformation, while Rao and Metts (2003) presented a stage model for electronic commerce development in small and medium sized enterprises. In the area of knowledge management technology, Housel and Bell (2001) developed a five level model. In the area of knowledge management systems, Gottschalk (2007) developed a four-stage model applied to knowledge management.
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