Chapter X
Interoperability and Constituents of Interoperable Systems in Public Sector

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ABSTRACT

This chapter, based on analysis of literature, introduces a definition and a layered architecture for government information systems. It argues that the interoperability of information systems is essential in providing integrated government services, but unfortunately there is no consensus on what interoperability is and what constitutes interoperable information systems. By analysing available academic literature and government reports on interoperability, the authors have attempted to address this problem. Based on the study, a comprehensive definition of interoperability is presented here. Further, the authors have identified four constituents of interoperable system and finally, a layered architecture for interoperability of government information systems has been presented. The authors believe that an unambiguous definition and clear idea about constituent of interoperability would remove much confusion in conceptualisation, design, and development of interoperable systems in government.
E-government all over the world are slowly graduating from Cataloguing and Information stage to integrated One-stop service provisioning. One-stop Government refers to the integration of public services from a citizen or customer of public services point of view. Ideally, online one-stop government requires that all public authorities are interconnected and that the citizen is able to access public services from a single point even if these services are actually provided by different departments or authorities. Furthermore, the citizen should be able to access these services in terms of life-events and without knowledge of the functional fragmentation of the public sector (Tambouris, 2001).

But in reality we are far from the ideal situation, one reason for this is difficulty in attaining interoperability among government information systems (Landsbergen & Wolken, 2001). The difficulty in attaining interoperability is not simply technical; it includes organizational, economic, political and cultural issues. Although, most of the articles on e-government interoperability deal mainly with technical aspects, there is growing realization that interoperability is much more complex than getting the ‘bits and bytes to flow properly’ between two systems (Landsbergen & Wolken, 2001). At the same time Pardo & Scholl (2002) in their study indicates interdependence of social, behavioural and technical aspects in success of information systems in public sector. Such a holistic view, in our opinion should be reflected in the definition of interoperability. But unfortunately there is no consensus on the definition of interoperability. Most of the definitions are mainly technology oriented with no or very little mention of the other dimensions of interoperability. In this chapter, a literature based study is done to find out various definitions available in literature. Based on the analysis of these definitions, a comprehensive definition of interoperability for government domain is presented. The detailed study of the literature is continued further to identify various facets of interoperability. At the end a layered architecture consisting of various domains of interoperability are presented.

**BACKGROUND**

Dawes (2002) defines e-government as “E-government is the use of information technology to support government operations, engage citizens, and provide government services”. Based on academic research and practical experience, Dawes (2002) further says that transformation from traditional program based service to integrated service would be one of the main requirements in future. According to her, future vision of e-government is that of integrated information and services.

Transformation from the very basic stage of e-government to the integrated service provisioning is not simple, but it evolves through stages, with progressively added degree of technological and organizational sophistication at each stage (Gil-Garcia & Martinez-Moyano, 2007). Although the stages of evolution are neither strictly mutually exclusive or progressive, nor there is consensus on stages and their numbers. Gil-Garcia & Martinez-Moyano (2007) give an exhaustive list of stages of e-government evolution. They are—Initial presence, Extended presence, Interactive presence, Transactional presence, Vertical integration, Horizontal integration and Totally integrated presence.

Despite difference about nomenclature of the final stage, there is agreement on the purpose of the stage, i.e. delivery of integrated service and information (Irani, AlSebie & Elliman 2006). This stage refers to a situation, where government services are integrated both vertically across different levels of government and horizontally cutting across different services and functions of government. A transformation of government so far unseen takes place at this stage, where services are arranged according to the requirements of
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