Approaching E-Government Interoperability
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What is This?
Approaching E-Government Interoperability

Mila Gascó

Abstract
E-government interoperability is not something new. However, this term has grown in importance as a result of the need to design and offer more sophisticated and complex e-government services that, many times, require the collaboration of two or more public institutions. Meaningful research on this topic could therefore be helpful in providing a basis for more clarity, insight, and understanding of this important topic. This is what this special issue is aimed at: to generate new and relevant scholarly contributions on interoperability that gather the diverse interests of an experienced set of authors, geographically distributed and with different perspectives on this issue.

Keywords
interoperability, e-government, cooperation

Introduction
More and more, it is clear that the classic organizational structure of public administrations faces, nowadays, many obstacles to respond to the emergence of new citizen demands that cannot be addressed by only one organization. As a result, growingly, public administrations are considering the need to work transversely and cooperatively with other public institutions, but also with other agents, with regard to common goals that will improve both political and administrative processes and results. The electronic government field is not unaware of what is happening and that is why it is increasingly adopting the interoperability concept.

What is Interoperability?
According to the European Commission (2010), interoperability can be defined as “the ability of disparate and diverse organizations to interact toward mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organizations, through the business processes they support, by means of the exchange of data between their respective ICT systems” (p. 2).

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Interoperability has several dimensions (Criado, Gascó, & Jiménez, 2010):

1. Technical interoperability: it refers to those technical issues that guarantee that the technological components of the information systems of the different organizations involved are ready to cooperate. Therefore, it has to do with interfaces, interconnection services, data integration, middleware, data exchange, or security services, just to name a few examples.
2. Semantic interoperability: it deals with the meaning of data and information and, in particular, it guarantees the precise meaning of the exchanged information so that any application can understand and properly interpret it. Some of the tools aimed at achieving semantic interoperability are ontologies, thesaurus, metadata, or classification systems.
3. Organizational interoperability: this aspect of interoperability is concerned with how organizations collaborate to achieve their mutually agreed goals. In practice, organizational interoperability is established through the integration of business processes and the related exchange of information. Therefore, it guarantees coordination and alignment of the administrative procedures that take place during service delivery.

The context that frames these three dimensions is related to what is called interoperability governance, that is, the agreements among governments and other actors that are involved in interoperability processes as well as the dialogue fora where those agreements are reached. Thus, interoperability governance relates to the political, legal, and structural conditions that are relevant for the development and use of interoperable applications.

Further, several interoperability levels can be found:

1. Intra-administrative interoperability: it refers to the initiatives that take place within a governmental organization but among different departments or units.
2. Horizontal interoperability: it is developed among different public administrations within the same level of government (local public administration–local public administration, state level public administration–state level public administration, ...).
3. Vertical interoperability: it takes place when different levels of government within a country interact (country level public administration–state public administration–local public administration).
4. Regional or crossborders interoperability: it refers to those interoperability projects that involve public administrations that belong to different countries. It usually takes place between country level or central public administrations.

**A Special Issue on E-Government Interoperability**

Despite the different initiatives in this field, achieving real interoperability is not easy. Too often, the projects have only focused on the technological dimension forgetting that there are other important issues (culture, organizational structures, leadership, workflows, legality, governance ...) that need to be addressed for an initiative to be successful. Both as a cause and as a consequence, the academia is not advancing too much either. Therefore, there is a need to conceptually and pragmatically build on e-government interoperability in order to develop a theoretical and conceptual framework, on one hand, and to identify best practices and key success factors that may guide the work of practitioners. Having this in mind, this special issue aims at presenting some interesting perspectives on interoperability that go beyond technological challenges and put on record the existence of political, cultural, and organizational variables that have to be taken into account when designing and implementing e-government interoperability projects.
The article by Theresa A. Pardo, Taewoo Nam, and Brian Burke, from the Center for Technology in Government, is very clear in this respect. The authors recognize that e-government interoperability represents a set of multidimensional, complementary, and dynamic capabilities needed among the networks of organizations in order to achieve successful information sharing. However, this view is complex and provides both researchers and practitioners with the challenge of understanding and developing multiple and very diverse interoperability capabilities. As a result, the article presents a framework for creating new understanding about the mix of diverse, yet interdependent and interacting sociotechnical dimensions of interoperability.

Janssen, a very well-known expert from the Delft University of Technology in the Netherlands, also stresses the importance of social and political aspects regarding interoperability. He starts clarifying some concepts and introducing the term enterprise architecture (EA). He states that although EA is as a technical instrument, its goals and scope are often organizational in nature. Thus, it is highly influenced by the social interdependencies and interactions among stakeholders in which it is embedded. As a result, there is a need to reconceptualize EA, incorporating relational capabilities, clear responsibilities, and sound governance mechanisms.

The article on the European Union, by Ignacio Criado, a professor in the Autonomous University of Madrid (Spain), refers to the e-government interoperability policy in this geographical context. Again, as the previous articles, it stresses the importance of governance mechanisms and, in particular, it describes and analyzes the so-called open method of coordination as the governance system operating within this policy field. The article is particularly interesting because it addresses interoperability in a multilevel governance setting and therefore it understands interoperability as a key tool in order to pursue regional integration within the European Union. Other than the European Union, only Latin America has firmly invested in regional interoperability what has resulted in two regional interoperability frameworks: the European Interoperability Framework (European Commission, 2004) and the Latin American Interoperability Framework (Marco Iberoamericano de Interoperabilidad; Criado, Gascó, & Jiménez, 2010).

One unaddressed factor when referring to interoperability has to do with its legal dimension. Actually, as Gamero, an expert on legal interoperability from the Pablo Olavide University in Seville (Spain) states, to achieve a significant level of interoperability, it is necessary to improve some rules concerning the e-government model and define a minimum set of standards for the different dimensions of interoperability, and also, for the legal one. As a consequence, the author, along his article, describes the different legal models that can be adopted when implementing interoperability initiatives and analyzes the pros and cons of each of them, illustrating its theories referring to the cases of Spain and the European Union.

The fifth article of this special issue takes the reader to Latin American and, in particular, to one of the more advanced countries in the world when it comes to interoperability: Brazil. Ernani Marques dos Santos, from the Federal University of Bahia, and Nicolau Reinhard, from the University of Sao Paulo, present e-Ping, the Brazilian interoperability framework, whose first version dates back to 2004. In particular, they focus on the barriers that have hindered the framework adoption. They study the political, organizational, financial, and technical ones and also refer to legal, jurisdictional, collaborative, informational, or managerial constraints. The authors conclude that interoperability is a complex process that requires special attention to issues that go beyond the technical and technological variables.

The last article takes a look at a different context but also from a totally different perspective than the previous papers. In this sense, this final article confirms interoperability is a very complex concept, a transversal one itself. It shows that e-government interoperability or, more plainly, government cooperation is the key regarding several topics and in numerous fields. One of them is specifically addressed by Quigley and Roy, from the Dalhousie University in Canada: cyber-
security. In their paper, the authors aim at gaining a fuller appreciation of the interplay of political, technological, organizational, and social dimensions of cyber-security; at understanding how this interplay is further shaped by clashing values and perceptions of risk; and at offering some prescriptive insight into the sorts of roles for government most likely to maximize systemic resilience and learning in an increasingly interdependent and virtual environment.

Collectively, the contributions to this issue show that there is a long way ahead. Interoperability has just begun. Governments around the world have only recently realized that, nowadays, e-government necessarily involves cooperation. As Gottschalk and Solli-Saether (2009) put it, “benefits of interoperability might be identified in terms of the defining purposes of digital government. High-ranking issues among the defining purposes of E-Government are highly agile, citizen-centric, accountable, transparent, effective, and efficient government operations and services (…). For reaching such goals, the integration of government information resources and processes, and thus the interoperation of interdependent information systems are essential” (p. 10). I thank the authors for their efforts and their insights in this important domain.

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