



Organization of Processes Digitization and E-Invoicing Services for an Effective Digital Transformation of Public Sector

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Abstract

The article tries to describe a model of analysis to evaluate and measure real benefits and organizational effects arising from the process of paper digitization and e-invoicing for the Italian Public Administrations. The analysis is focused also on the interaction between citizens, professionals, companies and the Italian public administrations. The approach at the basis of the investigation highlights several critical traits of the digitization activity and delivers an analysis that displays how those difficulties brought forward by motivational and involvement factors. The digital transformation in the Public sector can give several opportunities from the organizational point of view, but at the same time can propose some complex difficulties for the delivering of effective services and for the innovation development.

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A Viewpoint on Documents' Digitization Development in the Public Sector

The process of treatment of digital documents is often identified as cheaper, faster and safer than the traditional one, based on paper management. Permitting the quick management of the processes and often dropping expenses both for the public and for the private sectors, it can be used as an important leverage instrument in order to reach a higher level of quality.

The paper dematerialization is a subject that has affected frequently the current rules making a fundamental revolution, still in place, of the actions of public and private organisations.

More in particular, the gathering of laws and rules known as "Codice dell'Amministrazione Digitale" is on a real renovate process that is transforming the present digitization in a durable prerequisite for the public organizations (Ridolfi 2007), presenting at the same time, in relation to the documents to be submitted to the public organizations (Hood 2007), new certain quality's services to citizens, professionals and companies.

Austria, Finland, Norway, Denmark have all pioneered e-invoicing with the public sector, with Denmark having mandated as long ago as 2005. Spain boasts having completed its rollout of its paperless administration with a similar timeframe to Italy and Slovenia. Switzerland and Estonia are near roll out to the B2G (Business to Government) segment and France is set to follow along with Sweden. Although each country is at varying levels of adoption, with regard to each sector, each region or each agency, Europe is pretty much in good shape to meet the full member adoption by November 2018. When electronic invoicing is required in all B2G transactions, hundreds of thousands of governments offices and millions of suppliers will be affected.

In last two decades, the Italian Public Administration sector has been affected by several deep and radical changes (Hood 1991). In this period, different approaches to the government of public life and services emerged (Chun 2010). These were the New Public Management, the New Public Governance and, finally, the Open Government Model. These lines have contributed in different ways to achieve the great complexity (Lathrop et al. 2010) of the public organizations (Ciborra 2005). This means that Public Administration (PA) is continually considering new effective means to better develop its services (Casalino et al. 2014).

Inside this trend of changes, several approaches and practises of knowledge management systems (Rossignoli 2004) are obtaining a preponderance role in the public-sector. New high-tech chances (like web-apps, online portals, on demand services, etc.) and the increasing information request make it more and more vital for public organizations.

The increasing of access requests to public documents and data can be seen a strong opportunity to support a reorganization of public services, a tangible innovation (Borins 2001) and can increase the job's quality of more and more motivated civil servants.

Therefore, the possibility to increase a gradual access to public documents can be a substantial driver of growth to deploy new services and requests. Several Italian Public Administrations are adopting tools based on innovative document workflow management as a potential key to increase their efficiency and warrant a better customer satisfaction.

The process of paper digitization can be considered a great model of innovation for the Italian public organizations (Kickert 1997), especially for organizational and managerial aspects, led by the ICT adoption and for their diffusion. The main purpose is the progressive drop of the number of traditional administrative documents moved by the public administrations, managing also a gradual intensification of the digital native document combined with the replacement of traditional ones.

The adoption of definite tools such as digitization, electronic certified mail, digital signatures, electronic ID and the card of national service, was part of a complex change for the Italian Public Administrations. Digital documents can give substantial benefits for the public organizations. They will consent sooner drawing up, diffusion and storing.

The digitization of the documents is crucial for the Public Administration digital transformation because it is from and in it that diverge and converge the diverse organisational actions; the introduction of digital documents are dissimilar options for digital processes (such as the innovative payments' online system as "PagoPA") and the identification services (such as Italia Login, Sistema Pubblico di Identità Digitale - SPID, ANPR, etc.) that will allows a better integration of public services and a more usage of online services by citizens, companies, professionals.

These services can represent some most important applications of the digital innovation for the administrative transformation and digitization of the services provided by the involved Public Administrations, reaching substantial benefits in terms of cost, time and people management.

An Analysis of the Digitization Process

Our research is mainly focused on the analysis of how the document digitization process in the Italian public sector may contribute to the vision of the so called “Digital Administration” which, according to this vision, ought to produce great benefits for the citizens and for the same Public Administration.

In June 2014, electronic invoicing was made mandatory in the Italian public sector (including tax agencies, national social security and welfare agencies) involving at the same time thousands of suppliers of central and local Public Administrations. Other public sector bodies joined these affected Public Administrations by March 31, 2015 and the rollout of electronic invoicing in the Italian Public Sector has been completed and e-invoicing obligations extended to all supplies made by Italian suppliers to Public Administrations. (This will not apply to supplies provided by foreign businesses not registered for VAT in Italy).

The Italian government’s new invoicing regime was introduced partly to fight the tax avoidance, with an electronic payment/billing method that is traceable and which requires every invoice receipt to include, among other identifying stipulations, a so called “Codice Identificativo di Gara (CIG)” and “Codice Unico di Progetto (CUP)”. And what’s more, within three months from the effective date, Public Administrations (Kickert 1993) and suppliers are forbidden to accept or process any invoices in paper format and must keep invoices and their delivery receipts in digital format only.

But seriously, to help centrally manage the e-invoicing process, an Electronic Exchange System (EES) has been set up, in which the supplier can create, submit and send an e-invoice along with its unique identification code. The EES receives the electronic invoice and performs technical checks to verify it contains the right information.

There are three suggested ways in which suppliers can address the e-invoicing obligations as outlined quite succinctly in “E-invoicing a must for supplies to Italy agencies”. Suppliers with a limited number of Public Administration invoices could choose to operate using the tool made available by the Ministry of Economy and Finance (the tool allows suppliers to generate, transmit and archive electronic invoices, but it does not permit them to be integrated into the supplier’s accounting systems, and they have to be manually reported in the tool). Suppliers with more invoices could opt to manage the transmission of electronic invoices in-house by adapting their computer systems. Alternatively, a supplier may choose to outsource its e-invoicing (Casalino et al. 2011). So, suppliers are now under pressure to make sure their systems and processes are up to the task. Some have already gone a way down this route and some are struggling with fully understanding or implementing the requirement. Between the core purposes of the E-gov Plan, there is a specific one relating to paper digitization with the goal to reduce the conventional paper streams and increase both digital documents and flows.

The innovative goal is to reach a good e-invoicing stipulation and to fit or work with broader e-Procurement processes. It is a question of many suppliers’ minds along with how this new system will be applied, if at all, to international billing, and whether suppliers will now have two invoice processes to keep in place, as this is unlikely to work for the B2B (Business to Business). But this move does align Italy with EU obligations and other European countries that have already made this move, like France, Spain, Portugal or Austria.

Principal legislation regarding electronic invoicing:

- Italian law number 244 of 24 December 2007, provisions for drafting the annual and longer term financial statements of the State (Finance Act 2008) (Official Journal number 300 of 28 December 2007) as amended by Legislative Decree 201 of 2011. This is the provision which introduces (article 1, subsections 209-214) the obligation of electronic invoicing toward the Public Administration. Invoices in hardcopy format can no longer be accepted by the Public Administration, nor is it possible to proceed with the relative payment. The invoices must be transmitted via the Exchange System (ES) [Sistema di Interscambio - SdI];

- Decree of 7 March 2008, identification of the Provider of the Exchange System for electronic invoicing and the relative attributions and duties, pursuant to article 1, subsection 212 of Italian law number 244 of 24 December 2007 (Official Journal number 103 of 3 May 2008). The first implementing decree of Law number 244 of 2007 identifies the Revenue Agency as the provider of the Exchange System, defining their duties and responsibilities, and identifies Sogei SpA as the structure dedicated to the instrumental services and technical management of the Exchange Service.
- Decree of 3 April 2013, regulation on the issue, transmission and receipt of electronic invoices to be applied to public administrations pursuant to article 1, subsection 213, of Italian law number 244 of 24 December 2007 (Official Journal number 118 of 22 May 2013). The second implementing decree of Law number 244 of 2007 lays down the regulation which defines the process for the issue, transmission and receipt of the electronic invoice using the Exchange System (ES).
- Decree law of 24 April 2014, n. 66. Urgent measures for the competitiveness and the social justice (art 25). The decree of Law anticipates 31 March 2015, the starting date of the obligations of invoicing for the central government under Article 6, paragraph 3 of the Decree of the Minister of Economy and Finance dated 3 April 2013, n. 55, and for the local authorities referred to in paragraph 209 of Law no. 244 of 2007.
- Presidential Decree number 633 of 26 October 1972, as amended by Law number 228 of 24 December 2012 (the Stability Law). The Stability Law, in article 1, subsections 324-335, implements Directive 2010/45/EU amending Presidential Decree 633/72. The amended articles 21 and 39 contain the definition of the electronic invoice, and the features and technical requirements of the same, examples of technical procedures to guarantee the authenticity of the origin and the integrity of the content of the electronic invoice and methods for its storage.
- Community directive 45 of 2010 relative to the common system of value-added tax in respect of the provisions on electronic invoicing. The directive modifies directive 2006/112/EC, about the provisions on invoicing, dictating a series of indications and measures to simplify the electronic-invoice issue, management and storage procedures.
- Directive 2006/112/EC of the European Council of 28 November 2006, relative to the common system of Value-Added Tax. This is the Directive which establishes the conditions and provisions regarding value-added tax to ensure correct functioning of the internal EU market.
- Decree of 23 January 2004 containing "methods for fulfilling tax obligations relative to electronic documents and their reproduction on various platforms (Official Journal number 27 of 3 February 2004). The decree disciplines, for tax purposes, the issue, storage and presentation of electronic documents, as well as the digital storage of analogue documents.

Methodological Approach and Interoperability

In the era of the advanced information society, the interoperability of information systems of different organizations, both public and private, is becoming the main factor for the efficiency of the economy. Interoperability, within the context of e-government and public service delivery, is the ability of various organizations at different levels (European, national, local and sectorial, etc.) to interact towards mutually beneficial and agreed common goals (Casalino et al. 2011).

This involves the sharing of information and knowledge between public and private organizations, through the business processes they support (Boccardelli et al. 2009), by means of the exchange, process, and correct interpretation of data between ICT systems used in the organizations (Fontana et al. 2013). Several directives of the European Commission indicate the crucial role of this trend in the development of information society. The Digital Agenda for Europe, one of the seven flagships in the Europe 2020 Strategy, defines interoperability as the main line of action.

The relevance of interoperability in public sector is actually evident considering the several governmental programs, action plans, and policy documents published in recent years at national and European levels.

The government strategy (Osborne 1992) for the innovation of several public services, known as “Piano E-gov 2012” can be considered an effective initiative for a real transformation of Italian national, regional and local administrations. In the context of the existing economic crisis, this approach in line with the Lisbon strategy, deals the problem (Marengo 2005) of competition distance between Italy and the other advanced Countries, aiming to renew the public organizations and to improve the efficiency of several services (especially related to the e-invoicing integration between public organizations and companies).

Moreover, there is an enormous number of projects on interoperability matters supported by the European Commission under the last framework programs (H2020, CEF and Erasmus+), and a huge number of conferences, scientific commissions or practitioner associations focused on the interoperability area.

In this perspective, several issues, knowledge units, best practice, and legal base of interoperability must be done fully understandable for all (staff of local, regional, and national public administrations, national institutions and agencies, managers of e-government projects, public service developers, policy makers, etc.) who are involved in planning, designing and realizing effective European public services.

Taking into account a huge number of legislative documents, European Commission’s initiatives, funding programs, and research projects all related to interoperability, it is not correctly clear how to connect at European level the main concepts like interoperability, public service, public administration, and e-government (Sorrentino & De Marco 2010).

From the public administration’s point of view, in the last five years we investigated several processes of document management, especially related central public administrations, emphasizing how the introduction of new technologies (the main analysed processes are based on the Digital Signature services and the adoption of Certified Mail) can affect the global amount of interior digital documents, consequently saving both on average document creation and storing expenses. Some of the advantages of effective document management include: improved access to documents; improved working place efficiency; reduced day to day operation costs; better use of office space; safeguarding of confidential information; reduced customer complaints; prevention of legal breaches. The analysed document management systems have to: ensure review of all controlled documents on an annual basis; obtain the required approvals for the new or changed document; monitor changed documents; ensure documents conform to standard document templates.

From the citizens’ point of view, we also examined how IT knowledge between civil servants can allow effective online services for citizens and companies. It can constitute an important variable specially to reduce the civil servants digital gap with respect to the European average in public sector.

However, some difficulties still exist which prevent a full and satisfying interaction experience between public organizations and citizens, and these are mainly due to cultural issues and attitude towards change. The digitization process implies a profound modification in many areas inside the Public Administrations, both on a technical viewpoint and from the tools needed to achieve all the actions, up to the subsequent redefinition of an entire document management system (DMS). It is vital to consider for this kind of analysis 6 specific dimensions: historical context provides awareness of necessity and topicality of the problem, current e-government legislation and current political context both define the current context of interoperability, interoperability initiatives form the interoperability governance pyramid, ISA (Interoperability Solutions for European Public Administrations) programme includes a number of actions aimed to support the interaction between European Public Administrations and the implementation of community policies and activities. Fig. 1 shows the main points of each dimension.

HISTORICAL CONTEXT	CURRENT EGOVERNMENT LEGISLATION	CURRENT POLITICAL CONTEXT	INTEROPERABILITY INITIATIVES	ISA PROGRAMME	RESULTS OF LARGE SCALE PILOTS
<ul style="list-style-type: none"> Ministerial eGovernment conferences Ministerial declarations EU action plans EU programmes on interoperability EU Commission's communications EU directives Reports 	<ul style="list-style-type: none"> Data protection/privacy eCommerce eCommunications eSignatures eProcurement Re-use of public sector information eIdentification eDocuments eRecords 	<ul style="list-style-type: none"> The Europe 2020 Strategy The Digital Agenda for Europe The European eGovernment Action Plan (2011-2015) 	<ul style="list-style-type: none"> Strategy Frameworks Guidelines Services and Tools 	<ul style="list-style-type: none"> Trusted information exchange Interoperability architecture Assessment of ICT implications of new EU legislation Accompanying measures 	<ul style="list-style-type: none"> eCODEX epSOS PEPPOL SPOCS STORK
INTEROPERABILITY					
Definition of eGovernment		Definition of public service		Definition of interoperability	
				Definition of public administration	
Main parties involved in development and usage of public services and their interaction scenarios					
Electronic barriers		Benefits and beneficiaries of interoperable public services		Examples of public services	

Figure 1. Dimensions regarding the interoperability at European level.

It is necessary to consider that interoperability at European level is promoted through several edges, which form the interoperability governance pyramid (Fig. 2):

1. The European Interoperability Strategy of 2010 focuses on the governance activities and prioritization of activities required to increase collaboration (Tapscott 2008), interchange, and mutual aid among European public administrations across borders for the provision of public services;
2. The European Interoperability Framework (EIF) accepted in the same year looks at the conception of European public services and it covers the following content: 25 recommendations for Public Administrations, 12 underlying principles illustrating the context in which European public services are established and implemented, the conceptual model for public services, 4 levels of interoperability (legal, organizational, semantic, and technical interoperability), the concept of interoperability agreements, and the governance of interoperability. In parallel with development of the EIF, the member states develop their National Interoperability Frameworks (NIF) that are more detailed and often-prescriptive. The EIF and the NIFs must be aligned;
3. At the moment, an approved European-level interoperability architecture does not exist. Currently, in the framework of the ISA programme an action "Towards a European Interoperability Architecture - Elaboration of a common vision for a European Interoperability Architecture - EIA" started in 2010 and it ended in 2015. This action produced the common vision of interoperability architecture for European public services. The latest achievement in the development of the European Interoperability Architecture is the study on a common vision for a European Interoperability Architecture developed in 2011. The scope of the study is limited to cross-border and cross-sectorial interactions between member states and between member states and Commission services, dealing with Administration-to-Administration interactions;
4. The European Interoperable Infrastructure Services should support the operation of European public services. However, at the moment, only the study "European Interoperable Infrastructure Services - EIIS" (2009) which aims to identify common interoperability of EU infrastructure services.

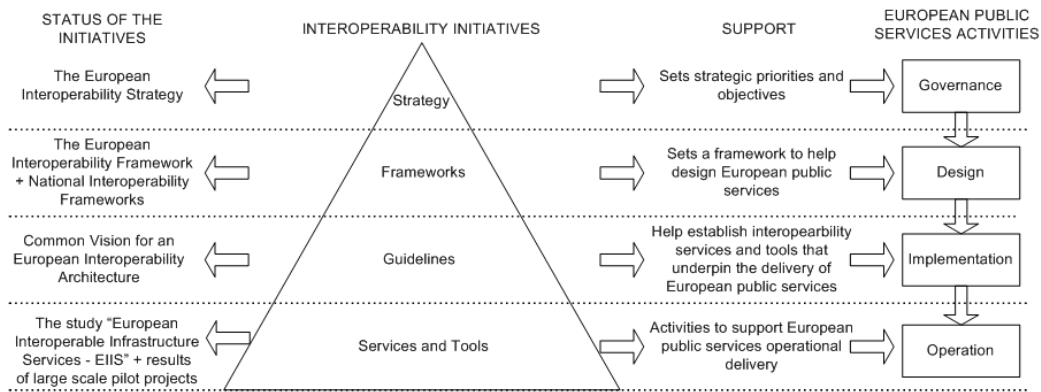


Figure 2. The interoperability governance pyramid modified (ISA, 2011a; ISA, 2011b).

Conclusions

Digital document management and interoperability of public services are tightly related to the goals of the European Digital Agenda and the Europe 2020 Strategy. Therefore, target groups involved in development of e-government need to have appropriate knowledge about interoperability issues. The analysis is based on information derived from research works regarding interoperability aspects both at European level and at each country level participating in the project. The target groups of the analysis reflect three potential groups of players: decision makers, public administration, and contractors developing e-government services.

The paper digitization establishes a great opportunity for the Public Administration to spread several aids. Paper digitization is the set of actions to resolve the distinctive difficulties of the paper such as the admission and diffusion problems, extraordinary expenses of treatment, space, search, packing, and timing.

The institution of an entirely ICT document managing inside Public Administrations, with the connected private companies and professionals, although it represents only a small progress, can be applied in the reengineering of organisational processes and can be a goal that could take place rapidly.

A document management system, still, springs the opportunity of numerous developments and more effectiveness within the central and local public organizations (Pfeffer 1981).

With the digitalization of administrative procedures, it is possible to get enormous savings in economic and in time terms (CNIPA 2006). There are at least two elements on which the public administrations should leverage to optimize their interior structure and, consequently, originate all concrete benefits for citizens and companies.

The digitization of the purchase-to-pay process remains a critical factor for the success of players in the retail sector, also in the current context where all processes are increasingly oriented to the consumer. Interoperability between companies and data safely exchanged in real time are fundamental to develop the new collaborative logic, that creates networks between companies and puts the citizen at the centre. Several are the resulting advantages: from cost reduction of each service to an increased speed of public supply processes. But, from the other hand, only thanks to the digitization of the whole purchase-to-pay process and the digital integration of commercial, logistical and financial processes, entrepreneurs and companies can fully appreciate all these advantages.

The needed training activities have to be seen as a means to achieve commitment, participation, communication, and cultural change, as well as to make civil servants feel comfortable with the revised processes and roles, besides to become supporters of the interoperability projects they are involved in.

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