Strategies and Policies to Avoid Digital Divide: The Italian Case in the European Landscape

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Abstract. The digital divide is a phenomenon that affects, with different intensity, several European countries, including Italy. Public policies, at the European and Italian level, play a relevant role in reducing the gap among countries with different level of digital development, and need to cope with its multifaceted nature. Currently both a European strategy for digitalization and an Italian digital agenda have been issued as policies to tackle the problem. This paper analyses from an exploratory perspective the strategies and policies issued by the Italian government to address the digital deployment of ICT infrastructures in the public administration, specifically targeting the education sector, within the background of the European context.

Keywords. Digital Divide, Public Policies, ICT

1 Introduction

Information and Communications Technologies (ICT) infrastructures play a relevant role in the management of services delivered by public administration (PA). They enrich the service portfolio the latter might offer to citizens and, in the end, they also act as leverages for economic development. The digital divide, intended as the separation of a part of the population/industry that has access to ICT infrastructures, particularly the Internet [1], from the part that has not, raises a barrier for the achievement of these benefits.

Both at the European and Italian level, strategies and policies were issued to tackle the problem and to further develop and complete the deployment of crucial ICT infrastructures, like the Internet. Within the context of the European 2020 strategy, the Italian government recently issued a set of public policies to tackle the digital divide issue [2], and to make progresses in the digitization of the Italian public administration. To this regard the paper presents an exploratory case study discussing the Italian policies on the deployment of ICT infrastructure with specific reference to the education sector (i.e. schools and universities).

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The remainder of the paper is structured as follows: section 2 provides some remarks on the research design and the methodology, while section 3 discusses the digital divide phenomenon under a theoretical point of view. The Italian case within the European context will be described in section 4, and discussed in section 5. Some final remarks conclude the paper in section 6.

2 Research design

As mentioned in the introduction, this paper aims at describing and discussing the recent policies issued by the Italian government on the deployment of ICT infrastructures in the PA, and more specifically in the education sector. In such sector we include both schools (primary and secondary), and universities. The paper adopts a qualitative approach based on the case study methodology provided by Yin [3]. The information sources used to describe and discuss the case are mainly formed by official documents and bills released by the central European and Italian regulatory institutions. In reading and analysing the sources we particularly draw our attention on European policies and their application in Italy obtained through projects devoted to the innovation of the education systems and the introduction of ICT infrastructures.

3 Digital Divide and Public Policies

The digital divide problem is long documented [4, 5]. Traditionally the digital divide is defined as the difference existing between those people who have access to the Internet and those who have not [6–8]. With the diffusion of broadband Internet, and with the increased requirements in terms of bandwidth of web 2.0 technologies and modern software platforms, this traditional view of digital divide was eventually extended to the difference existing between those people who have access to a broadband connection and those who have not. Research on this phenomenon contributed to identify different forms of digital divide[9]:

- Problems related to the ability of users to understand and use technologies (technology literacy);
- Problems related to the ability of a person with specific physical disabilities to be actually able to access contents through technologies, and to be able to access ICT based services;
- Problems related to the more or less intuitive design of the technology that allows users to be able to use it to achieve its goals;
- Problems related to the functionalities and the features available in the technology that might, or might not match the desires of the user.

The digital divide is not only a pure technological phenomenon, but it also involves human and social related aspects [10]. While it is important to deploy technologies that, considering the above-mentioned aspects, can be used by as many users as possible, it is at the same time relevant to provide training and to build competencies to let users use them. IT literacy is indeed seen both as a form of divide, and as a source of the divide itself [11].

The presence of individuals that are in a condition of divide with regards to technology obviously create a social inequality issue [11]. More important than this, it also has consequences in terms of competitiveness of a nation or of a territory [12], especially in a globalization perspective.

Currently different views on the digital divide are available in literature. A first view concerns the basic distinction between those who have and those who have not access to technology, which corresponds to the traditional definition previously mentioned. In this view the focus is on the technology itself, and the possibility for people to access it. According to this view the reduction of the digital divide requires actions to increase and improve the availability of the technologies for people [13, 14].

A different perspective moves away from this dualistic view and treats the digital divide as a multidimensional phenomenon. Under this perspective is not the access to the technology that is relevant, which in this view is somehow taken as granted, but it is more important to focus on the way people make use of the technology [15] and on other aspects, like for example IT literacy [16, 17]. According to this view, actions devoted to improve the availability of the technology will not tackle the digital divide problem, since this is not technologically related, but user related.

Finally a third and different view also encompasses the presence of generational differences in the digital divide phenomenon [18, 19], recognizing that different groups use the technology in different ways [20, 21], and that among these groups a certain difference in their use behavior can be seen. Furthermore, this view moves away from the technology, and takes into consideration human and social aspects.

4 Public Policies for Digitalization

This section describes the case of the public policies for the deployment of ICT infrastructure in the public sector environment. The section is divided into two subsections. In the first one the European strategy for digitalization is described, while in the second one the application of such a strategy made by the Italian government through its policies in the education sector is described.

4.1 The European Strategy

Following the Lisbon strategy the European Union started the Europe 2020 initiative to foster and incentivize the digitalization of PA. The current financial crisis has challenged the achievement of the objectives of the strategy, that recently, re-oriented towards the achievement of the following three priorities: (i) a knowledge and innovation based economy, (ii) a sustainable growth through a green economy, (iii) a growth through incentives to employment, social, and territorial cohesion. These priorities imply investment plans towards education, innovation, digital society, energy, mobility, competitiveness, and social inclusion, which are promoted by the European Union, but have to be put into action by individual member states.

The strategy underlying these priorities is the European Digital Agenda [22], which aims at developing a digital single market to generate smart, sustainable, and inclusive growth in Europe. This ambitious objective is contrasted by several obstacles: the presence of fragmented digital markets, the lack of interoperability, the rising cybercrime and risk of low trust in networks, the lack of investment in networks, the insufficient research and innovation efforts, the lack of digital literacy and skills, and the missed opportunities in addressing societal challenges.

The achievement of the objectives of the European Digital Agenda will require a strong commitment, not only of the government of the European Union, but also of the member states. Investments in research and innovation, the diffusion of ICT literacy, and the deployment of smart technologies for society are seen, amongst others, as necessary actions by the European Union to achieve the objectives of the Agenda.

4.2 The Italian Public Policies

The deployment of digital technologies for PA in Italy falls under the broader policy for national development devoted to reach the European targets aiming at creating a knowledge based economy. The European Digital Agenda was signed by all member states in 2010, and applied in Italy in 2012 with a decree of the Ministry of Economic Development known under the name of “Growth 2.0”. This decree specifies the conditions for the application of the European digital agenda and more precisely on the topics of: digital identity, digital PA, open data, digital education, digital healthcare, digital divide, electronic payments, and digital justice. Concerning this strategy, evidences from OECD reports [23] certify that the Italian digital eco-system cumulated relevant delays, especially on the infrastructural side, also considering that no significant changes were made since 2006 to it.

To coordinate the action of the central and local administrations in the endeavour to achieving these objectives, the Italian government created a steering committee for the digitization of PA divided into six different workgroups corresponding to six strategic axes of intervention:

- Infrastructures and security;
- E-commerce;
- E-government and open data;
- Digital literacy and competences;
- Research and innovation;
- Smart cities and communities.

This steering committee acts with the regulation power for the application of the European digital agenda in Italy. With regard to the interest of this paper, the main policies for the deployment of ICT infrastructures in the education sector are contained in the e-Gov 2012 plan, the growth 2.0 plan, and the national plan for a digital school.

The e-Gov 2012

The Italian government in 2009 started the e-Gov 2012 plan as a part of a broader action targeted to innovate and modernize the Italian PA. The plan had the merit to contribute to diffuse ICT technologies in schools and universities with specific regard to the improvement of administrative processes, the promotion of transparency and efficiency, and to the strengthening of PA's capability of offering better services to citizens. Cornerstones of the e-Gov 2012 plan were the initiatives to foster the deployment and the development of ICTs. In total 539 actions were executed in a programme composed by about 80 projects developed by local administrations.

With regards to the education sector, the plan contributes to diffuse Internet technologies in schools and universities to provide better services to schools/universities, but also to families and students. In particular at the primary and secondary school level a set of priority projects were started for:

- Offering all schools an Internet connection;
- Including digital contents into education processes, also involving publishers;
- Offering a set of web-based services to ease the interaction between the families and the schools through the use of several different digital media;
- Creating a public on-line registry in which performance evaluations of single schools shall be made transparent and available to citizens;

– Providing students with a personal computer as a personal tool to support their learning activities.

Table 1. State oft he e-Gov 2012 plan [24]

	2009	**2010**	**2011**	**2012**	**Tot. Prog.**
Networked schools					
Connection of plexes	11	14	14	14	53
Connection of classrooms		5	15	20	40
Intenet in classrooms	5	10	10	10	35
Digital didactic project					
Computer Labs	25	20	10		55
Platform Innova Schola	4	6	9	10	29
Project School-Family Services via Web					
Development and diffusion	4	4	6	6	20
Project "Compagno di Classe"					
Tutoring ad communication	1				
Project National Schools Registry Office					
Development and Diffusion	2	2	2	2	8
Total	52	61	66	62	**240**

A brief overlook of the actions performed within the activities of the e-Gov 2012 plan is available in Table 1.

At the level of the universities the main actions were related to the use of the Internet and of digital media to promote administrative simplifications. All universities had to be provided with a set of digital services for faculties, students, and technical and administrative personnel to reduce paper based documental exchanges between universities and families, and to ease and speed up the processes. The main interventions in this case focused on:

– The deployment of WIFI networks;
– The deployment of VOIP technologies;
– The development of on-line enrolment services;
– The development of on-line records for exams;
– The simplification of some regulations of the PA;
– The redesign and the improvement of internal operative processes;

- The reduction of administrative costs for citizens and enterprises;
- The reduction of PA operative costs;
- The certification of time and promptness of the services offered.

The Growth 2.0 Plan

The Growth 2.0 plan is part of larger action of the Italian government, which focused on the empowerment of digital services and infrastructures, on the stimulus to the creation of innovative start-ups, and on the attraction of foreign investments. With regards to the aim of this paper, the plan posits that from the academic year 2013/2014 all Italian universities shall have an electronic record for each student containing all the documents and the data pertinent to his/her academic curriculum. This record will be used to manage the entire academic career of the student in a digital way, without using paper, and making the transition of students from different universities easier. For the same period, the plan specifies the possibilities, for Italian schools, to use e-books, and to transmit documents through digital media to other PA bodies. Specific policies on the usage of certified e-mail, on the creation of open data, and on the respect of accessibility criteria are also provided.

These measures promote a renewal in the education system, and are necessary steps for a transition to a complete use of ICT technologies by students, families, and administrations. The plan also fosters the development of mobile and landline telecommunication infrastructures with a budget of 150 M€ in 2013.

A specific agency for the promotion of the digital technologies in the PA, the Italian Digital Agency, was created unifying pre-existing agencies (DigitPA, the Agency for the diffusion of technology and innovation, and the Department for Digitization and Technology Innovation) with a governance role for the overall ICT infrastructure in the PA. Within the responsibilities of this agency falls also the promotion of ICT culture to improve ICT literacy devoted both to citizens, and employees of the PA.

The National Plan for Digital Schools

The national plan for digital schools was originally started in 2007/2008 to reduce the digital divide inside the education institutions in Italy. Besides this, the plan was also devoted to support teachers' life long learning, and to promote the deep modification of traditional learning environments.

Table 2. Synthesis of the actions of the National Plan for Digital School

Actions	Financial Resources	Rooms/Schools	Students Involved	Teachers Involved

Interactive board	93 M€	322.000 rooms	1.000.000	83.000
Cl@ssi 2.0	10 M€	416 rooms	8.600	3.160
School 2.0	3,7 M€	15 schools	13.500	1.350

The plan saw the presence of the following actions, which are necessary to achieve the stated objectives:

- Interactive and Multi-media board: to introduce digital media in education practice, especially through the use of the interactive and multi-media board in classrooms;
- Cl@assi 2.0 (cl@assrom 2.0): to promote the diffusion of learning environments that exploit digital media capabilities;
- Scuol@ 2.0 (schools 2.0): to change the education strategy, ensuring that both curricular and extra-curricular activities support a student focused learning.

Some key figures regarding this plan are shown in Table 2.

5 Discussion

The information regarding the Italian policies provided in section 4 depict an improving situation. Notwithstanding the action, in recent years, of different governments, the policies dedicated to the deployment of ICT infrastructures in the PA to reduce the digital divide show a coherent attention towards the reduction of the gap currently existing between Italy and the average of the European countries. With regards to the education sector, we can state that the current Italian policies are sharply focusing more on the building and the deployment of the ICT infrastructure, like the diffusion of broadband connections in Italy, rather than on a strategic and systemic use of ICT. Just to cite the example of broadband connection, currently Italy is below the European average on landline connections, but has indeed fairly good results for broadband over mobile phones connection. These resources could have been more exploited in the national policy plan, but it is, currently, not the case.

This strategy is coherent with the dualistic view of digital divide that sees the technology as the main point of action to avoid the divide. Obviously, the starting point is to provide educational institutions, being them schools or universities, with the necessary ICT infrastructures (when and where not available) to allow them to provide innovative services. But, as theory shows, other forms of divide are still possible even in the abundant presence of technology. For example, some of the Italian policies are devoted to the adoption of e-learning in the education environment [24]. But moving to e-learning is not just a matter of moving paper contents to a digital media.

A strategy to support the learning process is necessary, and attention to digital literacy, both of students and instructors, is equally important [24].

On the administrative side, the stress on PA innovation to be achieved through the use of digital media instead of paper (for example) would better provide a stronger coordination effort with other regulations affecting public administrations (thence also the public education sector) that, especially for privacy and performance evaluation, require further changes. A stronger coordination of these heterogeneous initiatives would be desirable make easier change process, and not to hamper it under the heavy burden of excessive regulatory fulfillments. To this regard, a stronger action of the steering committee of the digitization of PA, together, with the other regulatory bodies in charge of PA change and innovation, would be advisable, and in the end potentially beneficial.

6 Conclusions

In this paper we described and discussed Italian policies for the deployment of ICT infrastructures in the education sector (schools and universities) within the context of the European regulation. The paper illustrates the strong focus of Italian policies on the deployment of technology, and suggests the need of a more strategic intervention and a stronger coordination with other regulatory initiatives on transparency and performance that affect PAs in this moment. The Italian policies are currently aligned to the European context, but a strong effort is necessary for Italy to recover the gap increased over the years. A more systemic approach to the deployment of ICT infrastructures would therefore be advisable.

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