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## PUBLIC POLICIES FOR ICT UPDATE IN BUSINESS: SOME KEY INDICATORS FOR SPAIN IN THE EUROPEAN AREA

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### Abstract

**Purpose**—Based on the new face of business in the twenty first century, this general review is aimed at analyzing the use of information and communication technologies (ICT) as social technologies by Spanish enterprises in the European context, as a result of recent policy frameworks set at communitarian and national levels.

**Design/methodology/approach**—The paper reviews the guidelines marked by European common policies with regards to ICT update in business, just as the translation of such standards in the Spanish area. From this framework, implications of ICT adoption in the social relationships with consumers, employees, business partners and public authorities are analyzed by providing some figures in the Spanish context in comparison with the European average.

**Findings**—The analysis supports a positive effect of national policies on Spanish enterprises' use of social technologies in the interactions with their internal and external stakeholders, while some differences can be reported attending size and sector criteria. In this respect, ICT penetration seems to be widespread in Spanish enterprises longer than ten employees, specially within informatics, telecommunications and audiovisuals, whereas automation of interactions is moderated in micro-enterprises in the manufacture, building, retailing, and transportation sectors.

**Research limitations/implications**—The paper offers a general overview of the use of ICT as social technologies in Spanish enterprises based on public reports. However, further research should be oriented to analyze more in deep the impact of public policies on ICT adoption and usage in business, by explaining their determining factors and comparing different clusters of counties and major regions of the world.

**Practical implications**—The analysis reported point to the need of reinforcing the Spanish positioning in the ICT European sector in the long term. In this sense, future policy measures should be devoted to overcome barriers to more advanced ICT use in business, by fostering the generation of technological solutions adapted to different business models, increasing e-skills enhancing, and facilitating the access to financing sources.

**Originality/Value**—This paper offers an alternative analysis of ICT deployment in the European and Spanish business sectors based on the discussion of how surrounding enterprises are driven to restructure the way which information is generated and shared inside and outside them, thus defining a new way of technology-mediated social transactions with clients, employees and external stakeholders.

**Keywords:** ICT update, public policies, social transactions in business, e-commerce, e-government, European area, Spain.

**Research type:** general review.

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## Introduction

While originally the term *social technology* was proposed to designate the use of general technologies for social purposes or with a social basis (Helmer et al, 1966), nowadays the concept is pretty much closer to Internet applications and other Information and Communication Technologies (ICT), as a result of the emergence of social utilities based on on-line interactions (Li and Bernoff, 2008). Not in vain, recent globalization and ICT deployment have rapidly changed the way in which we live, work and interact in an age which has been definitely named *information society* (Bell, 1973; Castells, 1996).

The reach of such socioeconomic transformations has set ICT uptake at the heart of a host of requirements and public standards in the countries of the European Union (EU), in an effort that has reached out to affect a wide range of social and economic policies. In short, better access for all citizens to the new technological possibilities of the information age is understood as a mean of learning, employment, inclusion, access to public services and quality of life, by affecting the way in which people obtain, share and use information. As a result, ICT are becoming more widely used and are benefiting more people. For instance, regular Internet use (defined as at least once a week) is a mainstream phenomenon in Europe, reaching the 60% of citizens aged 16 to 74 years old in 2009 (European Commission, 2010).

Beyond such social implications, penetration of ICT in enterprises has been recognized as a priority in current European policy agendas, as a mean of economic growth and productivity (European Commission, 2010; Reenen et al, 2010). That change in the European economic model has resulted in a generalized automation of businesses, enabling a radical change in structures of organizations and means of developing, producing and commercializing digital and traditional goods and services, just as in work and business methods and trade and consumption patterns in and between enterprises and consumers.

As a facet of this organizational transformation, surrounding enterprises are driven to restructure the way in which information is generated and shared inside and outside them, to such an extent that technology-mediated interactions define a new way of social transactions with clients, employees and external stakeholders. From this framework, this paper is aimed at analyzing the use of ICT as social technologies by Spanish enterprises in the European conjoint. Regardless Northern European countries have reached the highest levels of ICT sophistication in business over the last years, Spanish enterprises' ICT uptake has been strong from the mid last decade, reflecting the boost of the national economic policies adopted in this sense (National Observatory on Telecommunications and Information Society [ONTSI], 2011).

To this aim, next sections are organized as follow. First, we review the guidelines marked by European common policies with regard to ICT uptake in business, just as the translation of such standards in the Spanish area. Next, we analyze the implications of ICT adoption in the relationships with consumers, employees, government and other external partners, and provide some figures in the Spanish context in comparison with general figures from Europe. Finally, conclusions and implications of the picture described are discussed.

## 1. ICT Policy Frameworks in Europe

In response to major structural challenges faced by developed countries in the knowledge society, ICT uptake has represented a key point in the two general political frameworks set in Europe for the twenty first century, the *Lisbon Strategy* and the current *Europe 2020 Strategy* (Figure 1).

The *Lisbon Strategy* was launched in 2000 as a ten-year action and development plan for the economy of the European Union (EU). The initiative was aimed at making Europe “the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth, with more and better jobs and greater social cohesion” (Council of the EU, 2000). After moderated results, the strategy was re-launched in spring 2005, in view of the need to accelerate structural reforms to overcome the economic and financial crisis. In this context, the objectives of generating growth and employment were reinforced by investing in people's skills, the greening of the economy and innovation.

From this political setting, ICT have been included in several initiatives consistent with the Lisbon governance cycle, as key instruments for social and economic pursuits.

As general frameworks, two programmers of the Information Society and Media Directorate General (DG) set the measures to adopt in this period: the *eEurope* initiative and the *i2010* initiative.

The *eEurope* initiative was launched in 2000 to accelerate Europe’s transition towards a knowledge based economy and to realize the potential benefits of better access for all citizens and organizations to the services of the information age. Particularly, the *eEurope 2002* and *eEurope 2005* action plans focused on exploiting the advantages offered by the Internet and broadband technologies, increasing connectivity and delivering online services in both the public and private sectors<sup>1</sup>.

On these same lines, the *i2010* initiative was launched in 2005 to promote an open and competitive digital economy with ICT as drivers of inclusion and quality of life. To do that, the Commission proposed as a priority for Europe’s information society and media policies the completion of a Single European Information Space consistent with sustainable development. In the business area, this was translated into the recognition of the need to adopt new e-business models getting productivity gains from ICT, and adapt the working environment through efficient use of social technologies in the workplace and for a flexible organization of safe and high quality jobs.<sup>2</sup>

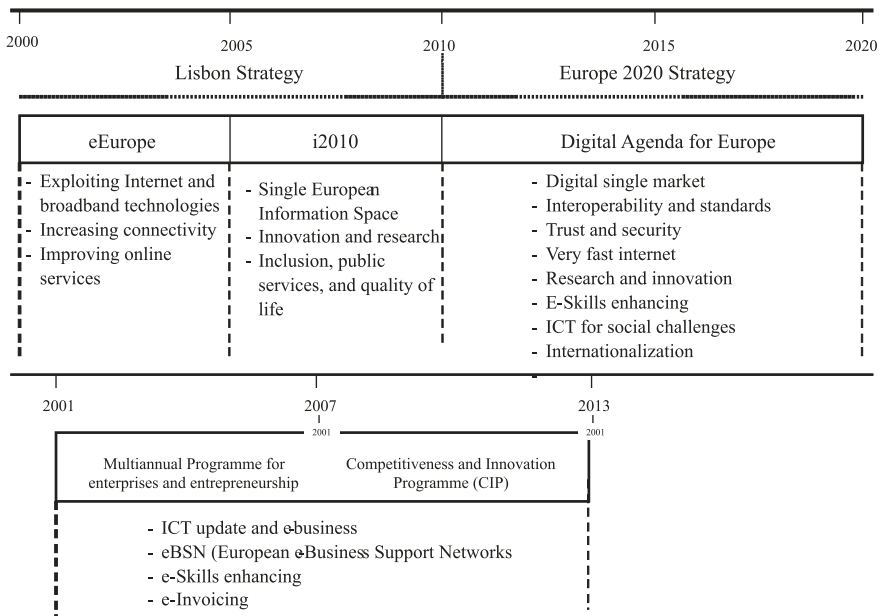


Figure 1. ICT European policy frameworks

1 Communication 2002/0263 final from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. *eEurope 2005: An information society for all. An action Plan to be presented in view of the Sevilla European Council, 21/22 June 2002.* [2002].

2 Communication 2005/229 final from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. [2005].

In parallel with these two general ICT work programmes, recognition of the need to create a more dynamic business environment as a *Lisbon strategy*'s key area led to include other specific measures in business policy frameworks, aimed at making the most of technological advances in reinforcing the competitiveness of European enterprises. As prior reference, the *European Chapter for Small Enterprises* (European Commission, 2000) stressed the objectives of improving online access, strengthening the technological capacity of small enterprises, and making use of successful e-business models and developing top-class small business support.

This objective was integrated in the *Multianual programme for enterprises and entrepreneurship*<sup>3</sup>, established as a general supportive framework for new and small enterprises for the period 2001–2007. Particularly, the measures proposed dealt with promoting the use of ICT in enterprises in order to simplify and improve their regulatory, administrative and financial environment, and enhance their competitiveness and innovation in a more and more globalized world.

In the context of these previous political arrangements, the European Commission launched in March 2010 the *Europe 2020 Strategy*<sup>4</sup> to exit the crisis and prepare the EU for the challenges of the next decade. In short, the new initiative embraces the pursuit of a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion. From this setting, the strategy recognizes, among others, the priority of reaping the benefits of a digital single market for households and firms.

According to that pursuit, the *Digital Agenda for Europe*<sup>5</sup> was launched in 2010 as a ten-year action programme oriented to maximise the social and economic potential of ICT, most notably the Internet, to spur innovation, growth and improvements in daily life for both citizens and businesses. Specific measures in this line include support to eCommerce and cross-border transactions, interoperability, trust and security, and e-skills enhancing.

Such action priorities are also contemplated by the current *Competitives and Innovation Programme* (CIP), adopted for the period 2007–2013 as a transition between the Lisbon cycle and the new priorities set by 2020. The CIP is divided into three operational programmes supporting measures to strengthen competitiveness and innovation capacity in the EU. Two of these programmes are worth mentioning in this section: The *ICT Policy Support Programme* and the *Entrepreneurship and Innovation Programme*.

First, the *ICT Policy Support Programme* backs the realization of the *Digital Agenda for Europe*, it being aligned with the priority of accelerating the wider update

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3 Council Decision 2000/819/CE of 20 December 2000 on a multiannual programme for enterprises and entrepreneurship, and in particular for small and medium-sized enterprises (SMEs) (2001–2005). [2000] OL L 333/84.

4 Communication 2010/2020 from the Commission. Europe 2020. A strategy for smart, sustainable and inclusive growth. [2010]

5 Communication 2010/245 final/2 from the Commission to the European Parliament, the Council, the European Economic and Committee and the Committee of the Regions. A Digital Agenda for Europe. [2010].

and best use of innovative digital technologies and contents by citizens, governments and businesses. In this last context, the programme addresses obstacles hindering further and better use of ICT based goods and services and barriers for the development of high growth businesses, notably small and medium-sized enterprises (SME) in this field.

In this same line, the *Entrepreneurship and Innovation Programme* seeks to promote innovation and SME in the EU, contemplating, among others, the objectives of supporting e-business networks, ICT uptake and standardization, promoting key technologies and e-skills, and e-invoicing.

Key policy frameworks set in Europe has translated into many national programmes in the EU Member States over the last decade. Nevertheless, many obvious differences in ICT update exist between businesses in different countries, thus making it difficult to estimate the real impact and effectiveness of such policy frameworks in the EU context. From this setting, analysis of the translation of common prescriptions into specific measures at national level might be useful to clarify the specific needs of different countries and regions in order to formulate future sectorial ICT policies more adapted to the real circumstances of European businesses. With this postulate in mind, next section is devoted to review recent national policies on organizational ICT update in Spain.

## 2. Spanish Policies for ICT Update in Business

In the specific case of Spain, the basic reference for the design of economic and social policies during the period 2005-2010 has been the *National Reform Programme* (Ministry of Presidence, 2005), established in convergence with the guidelines of the *Lisbon Strategy* (Figure 2).

Basically, the programme has been structured around seven central themes concerning employment, education and business. Among them, it was included an R&D&I strategy implemented through the programme *Ingenio 2010*, aimed at boosting technological innovation and the information society in Spain.

As part of such action programme, *Avanza Plan* was launched in 2005 to improve the level of ICT development in Spain with regards to the EU's average, especially in terms of coverage and connectivity. In this sense, the plan was conceived to support the new European model of economic growth based on ICT update to reach competitiveness, productivity, social and regional equality, and quality of life. In doing that, the programme envisaged four general action areas, named digital citizenship, digital economy, digital public services, and digital context.

Embedded in these four areas, some target objectives were oriented to improve technological capabilities in business settings, especially with regards to five key points including increment of ICT uptake in SME's business processes (i.e., e-invoicing), improvement of online communications with external stakeholders and inside the organization, ICT security, implantation of new models of e-business, and e-skills enhancing.

In general terms, *Avanza Plan* has represented an important driver of technological change in Spanish enterprises (ONTSI, 2011), it being followed by current *Avanza2 Plan* until 2015, which will be enriched in the new Spanish reforms programme planned for the new EU’s strategic period. Shortly, the second phase of the plan gives continuity to current actions at the same time that some other actualized objectives are included according to the new needs of Spanish ICT sector. Specially, it is hoped to place the country in a leader position in the development of advanced ICT goods and services, assisting the economic recovery by the generalized and intensive use of new technologies.

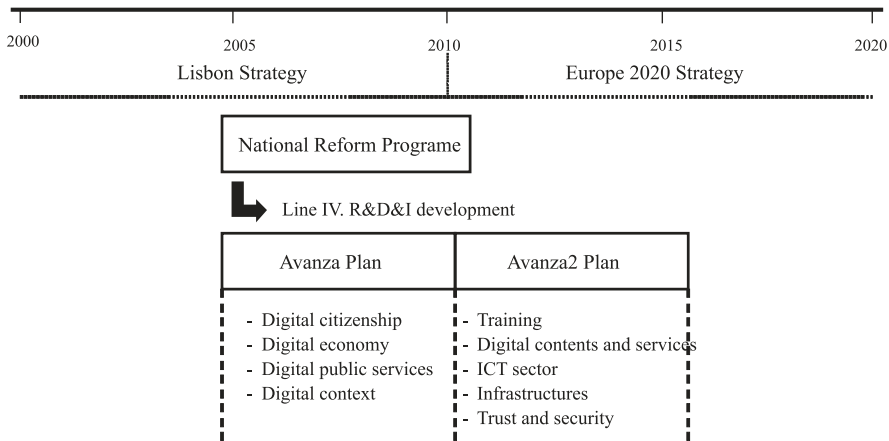


Figure 2. ICT Spanish policy frameworks

In the context of such pursuits, the *Avanza2 Plan* is organized around five strategic areas: training, digital contents and services, ICT sector development, infrastructures, and trust and security. These areas accommodates other specific lines affecting business, mainly the support to enterprises involved in the development of ICT products, processes, applications, contents and services, the incorporation of ICT qualified employees and enterprises to the information society, and the improvement of e-government services for businesses.

### 3. The use of Social Technologies in Business

Public policies fostering ICT update in Europe have had an evident impact on companies’ processes and work practices over the last decade. In this sense, use of personal computers, local networks and connections to the Internet is widespread in European enterprises, and the lack of basic ICT equipment affects only very small firms. Nevertheless, the level of e-business varies across the Member States. Reflecting patterns

of Internet usage, Northern European countries such as the United Kingdom, Sweden and Denmark have high levels—even surpassing leader countries such as Japan, Korea and United States, while Eastern and Southern countries perform poorly (European Commission, 2010).

As an example of ICT policies' impact in the Spanish area, *Avanza Plan* has achieved notable results in overcoming the limitations of the country at the beginning of the current century, particularly with regards to infrastructures and connectivity. For instance, among enterprises with more than ten employees, percentages of use of personal computers, broadband, and e-mail exceeded the 96% in 2010 (ONTSI, 2011). Nevertheless, such figure seemed to be lower for micro-enterprises and self-employed workers, the percentages oscillating in these cases between 45% and 60% (State Department of Telecommunications and Information Society, 2008). Beyond these discrepancies, sectors registering the highest levels of ICT update are finances and informatics, telecommunications and audiovisuals, while technological penetration is clearly lower in the manufacture, building, retailing, and transportation sectors (ONTSI, 2011).

In the context of such ICT deployment, repercussions of new technologies for economic growth and productivity in the European continent have not gone unnoticed (Reenen et al, 2010). In this respect, it is said that companies' use of ICT strengthens the single market, increasing transparency and efficiency, reducing cost, and lowering physical barriers to entry (European Commission, 2010). Likewise, many research attempts have been devoted to explain business value and impact of ICT in organizations (e.g., DeLone and McLean, 2003; Melville et al, 2004; Rivard et al, 2006).

Nevertheless, while it is worth mentioning that current maturity of technological developments gives enterprises the opportunity to exploit automation, open new markets and add value to products, research regarding the direct impact of ICT update on firm performance measures has resulted in inconsistent results (Carr, 2003; Lim et al, 2004; Sriram and Strump, 2004). That's why most recent models place a concept of organizational transformation at the very centre of any explanation of the business value resulting from ICT, as a driver of further change (Gregor et al, 2006; Sanders, 2007; Radhakrishnan et al, 2008; Soto-Acosta and Meroño-Cerdan, 2008; Ramírez et al, 2010).

On the basis of this premise, organizational transformation is defined as “the changes occurring over time in organizational systems and structures that are necessary to reap the full benefits from the use of ICT” (Gregor et al, 2006, p. 250). In such terms, it is defended that value of technological investment comes in part from the complementary investments in new processes and work practices which allow organizations to improve customer service (Brynjolfsson and Hitt, 2000).

As part of such meditating organizational transformation derived from technological change in organizations, surrounding enterprises are driven to restructure the way in which information is generated and shared inside and outside them, which consequently affects the nature of the relationships maintained with their stakeholders (Sanders, 2007). In sort, the new business scenario imposes the use of ICT as social technologies for data



exchange in and between enterprises, which permit them to perform at lower cost. As major expressions of this new scenario, interactions with customers are becoming more and more technology-mediated, while electronic operations and virtual communications define current transactions between business departments and with external interlocutors including public authorities and other partners such as suppliers and distributors.

Based on the previous description, we next analyze more in deep some of these new interaction possibilities derived from the use of ICT as social technologies in business, just as their incidence in Spanish enterprises as an example of political results derived from the Lisbon political cycle.

### E-Commerce practices and ICT use in the relationships with consumers

Generalized ICT update has led to more sophisticated models of market segmentation, customization and personalization, influencing the way in which enterprises both gather customer information and interact with their clients (Rust and Espinoza, 2006). By one hand, ICT permit more, new and better usages of information about clients. Technology innovations in business lead to an increase in available information and knowledge about markets and competitors, assisting companies on improving their offer of goods and services suited to consumers' dynamic needs (Vargo and Lusch, 2004; Rust and Thompson, 2006). Further, the rapid expansion of the information economy and electronic networks have converged in the concept of *e-service* or *e-commerce*, that is, the provision of goods and services over electronic networks such as the Internet (Rust, 2001; Rust and Kannan, 2002; Rust and Thompson, 2006).

On these lines, e-commerce practices have become a widespread phenomenon in European countries, bringing a lot of advantages and options for customers and industries when choosing products in international markets. As an indicator, it is estimated that about 80% of European Internet users surf to find information about products, and 54% have ordered goods or services online in the last year, over the 47% registered in 2006 (European Commission, 2010).

In response to such consumption tendencies, 81% of medium and 90% of large European enterprises had a website in 2009, the average being 65% for small enterprises (European Commission, 2010). Similar figures were registered in Spain for the same year (ONTSI, 2011), the percentage of firms with website in the sector of informatics, telecommunications and audiovisuals exceeding 90%. Opposite, use of websites for business pursuits reached only the 13.1% of self-employed workers (State Department of Telecommunications and Information Society, 2008), and was minimal in the building industry (ONTSI, 2011).

With regards to the specific usages of websites, the more frequent are giving general information about the business activity (91%), providing access to products or prices records (58.3%), or presenting privacy and certification policies (50.9%). Less often ICT support purchase practices, with only a 25.1% of SME and large enterprises sending electronic invoices and 19.3% receiving on-line orders. In this sense, finance business, hostels and travel agencies provide the greatest variety of on-line services,

including product's reservation, order, purchase and payment (State Department of Telecommunications and Information Society, 2008; ONTSI, 2011).

### ICT and human resources management

The processes of business transformation derived from ICT adoption usually enable new forms and types of organizational structures and changes in labor division (Brynjolfsson and Hitt, 2000; Cooper et al, 2000; Garicano and Rossi-Hansberg, 2004, 2006; Grüner, 2009; Ramírez et al, 2010), therefore affecting the employees' way of working, the skills they use, their professional identity, and the relationships between different functions and profiles inside the enterprise.

Based on previous models on business process redesign (Mooney et al, 1986; Kohli and Hoadley, 2006) Ramirez et al (2010) distributed such ICT effects on human resource management in three categories at the process level: informational, automational and transformational. Informational effects result from the implementation of ICT and work practices that affect the organization's capability to collect, store, process and disseminate information. Automational effects result from use of ICT and work practices to automate business processes, removing the use of labor inputs in firm activities. Finally, transformational effects arise from the use of ICT and work practices to bring about process innovation and transformation.

Regarding the specific implications of ICT adoption for human resources in the European area, the proportion of employees using computers has been relatively stable over last mid-decade, growing from 48% to 51% in 2009, with 79% of them using computers with access to the web. However, there are some nuances when distinguishing between specialists and workers with ICT user skills. While the first group is relatively stable at around 3% of the workforce, the second accounted for 18% of workers in 2009, some differences existing between countries. In this respect, Denmark, Latvia, Lithuania, United Kingdom and Luxembourg had higher values, ranging from 24% to 33%, while Romania, Portugal and Bulgaria are at the opposite end, with only 10-13% of the workforce possessing ICT qualifications (European Commission, 2010). In the case of Spain, firms present slightly high levels of ICT update, with 56% of employees using personal computers in 2009. This percentage ranges from 47.7% in small enterprises to 63% in large companies, the greatest levels of employees' ICT use concentrating on finances sector and informatics, telecommunications and audiovisuals (ONTSI, 2011). Further, 28.6% of the workforce in firms longer than ten employees corresponds to ICT qualified workers.

In the context of such figures, applications to share electronic information inside the enterprise have been adopted by 40% of European companies, although this percentage ranges from 71% of large enterprises and only one third of small business (European Commission, 2010). Such applications are used mainly for the exchange of accounting information or the management of inventory levels, production and distribution. The same tendencies can be extended to Spanish enterprises, where tools like ERP ("Enterprise Resource Planning") and CRM ("Customer Relationship Management")

are used by 22.5% and 28.6% of enterprises respectively, to share information between different functional areas and departments. Otherwise, remote work through external networks is becoming a widespread application of ICT in Spain, affecting 15.9% of employees in small enterprises, 38% in medium firms, and 61.6% in large companies (ONTSI, 2011).

### ICT use in interactions with business partners

Another key application of ICT in enterprises automates the relationships with business partners, assisting external collaboration and information sharing. In this sense, current trends in e-business indicate an increasing number of businesses connected with each other in order to streamline their business processes (Lin, 2006; Kauremaa et al, 2010). Further, Internet enabled supply chains are today powerful strategic weapons due to their unparalleled integration of information among partners at relatively low transaction cost (Noteboom, 1992; Clemons et al, 1993; Sanders, 2007).

At EU level, 41% of enterprises have some form of automated data exchange with other ICT systems outside the enterprise. Such exchanges concern the sending and receiving of orders, electronic invoices, product information, transport documents, and payment instructions to financial institutions, and can be split into relations with other businesses (86%), financial institutions (72%), and public authorities (68%). If less frequently, ICT applications for supply chain management are being increasingly adopted by European firms, covering the 33% of large enterprises (European Commission, 2010).

Differences by country depend on the degree of ICT update by enterprises and the national practices and legal frameworks adopted. In general, Spain has a good position in the European conjoint, since it is estimated that about 45% of SME and large enterprises exchange data with external ICT systems, above the averaged 41% (ONTSI, 2011). In line with tendencies in other EU countries, such exchanges are mainly concerned with payment instructions to financial institutions (74%), product information (63.1%), and electronic invoices or transport documents (50%). Also, use of electronic signature in external communications is widespread in Spain, oscillating between the 38% of self-employed workers and the 51.4% of small enterprises and more than 80% of medium and large companies (ONTSI, 2011).

Regarding ICT applications for supply chain management, 17.6% of Spanish enterprises share online information with suppliers and distributors, the percentage exceeding 35% when only large enterprises are considered. Such data exchange is usually bidirectional and devoted to coordinate the availability and distribution of goods and services along the supply chain. Beyond this ICT usage, e-commerce practices between businesses are also worth mentioning, if more frequently used for purchases (24.1%) than for sales (13.1%), these last being more evident in hostels and travel agencies (ONTSI, 2011).

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## e-Government applications in business

Technological revolution has extended to public sector services (Norris et al, 2001; Choudrie et al, 2005; Davison et al, 2005), enhancing the access and delivery of government information and service to citizens, business, employees, and other agencies and entities (Symonds, 2000; West, 2004; Badri and Alshare, 2008). Such e-government applications offers enterprises a new way to search for information and conduct electronic interactions, it being positively related to different measures of performance, such as intelligence generation, cost reduction and time saving (Thompson et al, 2005; Badri and Alshare, 2008).

Last reports show that e-government for business has progressed fast and has reached a high level of sophistication in Europe. In this sense, some crucial services for enterprises like VAT, corporate tax, customs declarations and social contributions are fully available online in almost every EU country, while tools for the registration of new companies are still some way behind. That public offer has resulted in a 71% of European businesses using online government services, such percentage being above 80% in Denmark, Finland, Iceland, Lithuania and Slovakia (European Commission, 2010).

Likewise, 70.1% of Spanish enterprises with access to the Internet used in 2009 e-government applications to interact with the public administration. However, some differences existed depending on the size of firms. Particularly, only 42.8% of micro-enterprises and 66.6% of small enterprises used online government services, the percentage exceeding 90% for medium and large companies (State Department of Telecommunications and Information Society, 2008; ONTSI, 2011). The sectors concentrating the highest levels of e-government use were finances, professional activities, informatics, telecommunications and audiovisuals, and retailing.

Concerning the nature of the online interactions maintained between Spanish enterprises and public administrations (ONTSI, 2011), the more frequent usages are obtaining information and downloading specific forms (64%), returning filled forms (52%), electronic management services (51%) and e-procurement (9.4%).

## Conclusions

Over recent years, ICT uptake in business has represented a key point in public policies across European countries, resulting in a deep restructuring of enterprises' processes and work practices in order to reach higher levels of performance. As a major expression of such organizational transformation, technology-mediated interactions have come to redefine traditional social transactions with internal and external stakeholders, including customers, employees, business partners and public administrations.

Nevertheless, since many imbalances in ICT update exist between businesses in different countries—particularly when comparing Northern European countries with other Member States, the real effectiveness of such policy frameworks is difficult to estimate. In this context, this paper postulates that some analysis of the translation of

common prescriptions into specific measures at national level might be useful to clarify the specific needs of different countries and regions in order to formulate future sectorial ICT policies more adapted to the real circumstances of European businesses.

Particularly, and based on the new social face of business, previous sections were aimed at analyzing the use of ICT as social technologies by Spanish enterprises in the European context, as a result of recent policy frameworks set at communitarian and national levels. Derived from such analysis, some conclusions are worth mentioning.

In the context of a notable development of ICT sector in Spain over the last decade, it should be first stressed that ICT update in firms' internal and external transactions has reached the European average, according to the objectives set by *Avanza Plan* as the general policy framework in Spain over the period 2005-2010. Particularly, advances affect e-commerce practices, employees' ICT update and qualification, automated data exchange with external systems, and e-government practices. Opposite, main weaknesses have to do with the development and use of electronic applications for supply chain management.

On the other hand, the figures reported in previous sections reveal some important nuances in such picture when taking into account size and sector criteria. First, ICT penetration in Spanish business is widespread in large firms followed by SME, whereas automation is moderated in the case of micro-enterprises smaller than ten employees and self-employed workers. Second, sectors more favored by ICT interactions are obviously informatics, telecommunications and audiovisuals, just as finances, while less use of social technologies is common to the manufacture, building, retailing, and transportation sectors.

In short, the analysis reported in these pages shows that public policies adopted in Spain in the context of the *Lisbon Strategy* have given fresh impetus to national ICT sector and competitiveness of Spanish enterprises. However, further measures in this sense are needed to reinforce that positioning in the long term. As a priority in this sense, some efforts should be devoted to overcome barriers to more advanced use of ICT in business, particularly privacy and trust concerns, and lack of awareness of the benefits of online trade. Moreover, future action plans should be oriented to foster the generation of technological solutions adapted to the needs of different business models, to increase opportunities for e-skills enhancing, and to facilitate the access to financing sources and subventions for micro-enterprises and self-employed workers.

In sum, the experience reported in this paper stress the importance of a *bottom-up* perspective in defining sectorial policies to foster ICT update in organizations according to the real starting points and circumstances of different EU regions. From this view, while this paper offers a general review of the use of social technologies in Spanish enterprises based on public reports, further research could complement the picture offered by conducting specific quantitative or qualitative studies aimed at explaining the determining factors of ICT adoption and usage within different business models in Spain. Likewise, further research should be oriented to provide more in deep analysis on the effect of European public policies on ICT update in business, by comparing different clusters of countries, or even policies frameworks in different continents and major regions of the world.

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## VIEŠOSIOS IKT MODERNIZAVIMO VERSLO SEKTORIUJE POLITIKOS KRYPTYS: KELI REIKŠMINGI INDIKATORIAI ISPANIJOS IR EUROPOS ATVEJ AIS

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**Santrauka.** IKT modernizavimas verslo sektoriuje paskutiniais dešimtmečiais pripažįstamas Europos ekonominio augimo ir produktyvumo politikos prioritetu. Daugelis verslo įmonių perėjo prie automatizavimo, įgyvendindamos esminius organizacinės struktūros, plėtros priemonių, gamybos ir skaitmeninių bei tradicinių prekių ir paslaugų komercializavimo naujoves. Atitinkamai aplinkinės įmonės, kaip glaudžiai susijusios su šiomis organizacinėmis permainomis, verčiamos restruktūrizuoti vidaus ir išorės informacijos generavimo ir mainų būdus, kurie paveikia santykių su savininkais pobūdį. Santykiai su klientais, kaip pagrindinė šio proceso išraiška, vis labiau grindžiami technologijų tarpininkavimu, kai elektroninės operacijos ir virtuali komunikacija apibrėžia transakcijas tarp verslo padaliniių ir išorinių dalyvių, įskaitant viešosios valdžios atstovus ir kitus partnerius, tokius kaip tiekėjai ir platintojai.



Šiaurės Europos šalys per pastaruosius dešimtmečius pasiekė aukščiausią IKT išmavimo lygį. Tai buvo ekonominės politikos skatinimo padarinys, pastebimas visame žemyne. Šiame straipsnyje pateikti duomenys pagrindžia teigiamą naujų bendrų ir nacionalinės politikos krypčių poveikį socialinių technologijų plėtrai Ispanijos įmonėse bendraujant su savininkais, tobulinant e. komerciją ir darbuotojų kvalifikaciją IKT srityje, automatizuojant duomenų mainus su išorinėmis sistemomis ir e. valdžia. IKT diegimo mastas priklauso nuo sektoriaus dydžio ir kriterijų. Ispanijos įmonėse (didesnėse nei 10 darbuotojų) IKT taikomos vis plačiau, ypač informatikos, telekomunikacijų ir audiovizualinės veiklos srityse, tuo tarpu mažoms įmonėms, daugiausia gamybos, statybos, mažmeninės prekybos ir transporto sektoriuose, būdingas dalinis automatizavimas.

Atsižvelgiant į Europos politikos gaires numatytos Ispanijos viešosios politikos kryptys paskatino nacionalinio IKT sektoriaus plėtrą ir Ispanijos įmonių konkurencingumą. Ateities veiksmų planai turėtų būti orientuoti skatinti technologijas, kurios talkintų įvairiems verslo modeliams, siekiant padidinti e. įgūdžių įgijimo galimybes ir palengvinti priejimą prie finansinių šaltinių ir subsidijas mažoms įmonėms ir privačia praktika besiverčiantiems asmenims.

Tolesni tyrimai turėtų būti orientuoti į išsamesnę viešosios IKT diegimo ir taikymo versle politikos krypčių analizę, numatant lemiančius veiksnius ir lyginant skirtingų rajonų klasterių ir pasaulio regionų santykį.

**Raktažodžiai:** IKT modernizavimas, viešosios politikos kryptys, socialinės transakcijos versle, e. komercija, e. valdžia, Europa, Ispanija.