Introduction

The development undergone by the information and communication technologies (ICTs) or digital technologies during the last decades and the innovations in business associated with them have defined an economic space which is known by different names, including post-industrial society, knowledge economy, innovation economy, online economy, new economy, e-economy and digital economy[1] (Cohen et al., 2000). The digital economy is a complex and emerging phenomenon, related to microeconomy, macroeconomy and the theory of organization and administration (Orlikowski and Iacono, 2000). Its analysis now is relevant because, in the opinion of different authors and international organizations, the digital economy will explain the economic growth of the coming decades (Margherio, 1998; Kling and Lamb, 1999). Furthermore, regarding the management area, several lines of investigation exist on the study of the impact of the development of the Internet on firms. We could identify the following:

- impact on small and medium firms;
- impact on the mechanisms of coordination, market and organization;
- electronic organizations and electronic markets;
- Internet presence;
- impact on the organizational structure;
- marketing or Internet-based marketing; and
- business models and digital economy.

In this paper, the last item, related to digital economy, is studied in depth. In particular, the impact of the development of the digital economy on firms is described, by analysing the situation in Spanish firms.

In the first place, we will explain what is understood by digital economy. Also, its characteristics are delimited as regards the implications it will have in the future mainly for industry, markets and business. The different subsectors with which it is made up are also described, differentiating between the technological aspect and the economic activity as such, and we analyse the situation of each one of these subsections in the Spanish context.

We conclude with some final reflections about
how it is affecting and can affect in the future the development of this digital economy in the Spanish firms.

**Digital economy: concept, characteristics and impact of firms**

The first references to the digital or new economy are found in Tapscott (1996, 1998) and in the report *The Emerging Digital Economy* prepared by the US Department of Commerce (Margherio, 1998). The digital economy defines a new socio-political and economic system, characterised by an intelligent space, which is made up of information, instruments of access to and processing of the information and capacities of communication (Carley, 1999). In the US Department of Commerce report, components of the digital economy were identified for the first time:

- the industry of ICTs;
- the electronic commerce among firms;
- the digital distribution of goods and services; and
- the support for the sale of tangible goods, especially those systems and services using the Internet as opposed to other private telecommunication networks (Margherio, 1998).

According to Zimmermann and Koerner (1999, 2000) and Zimmermann (2000), the digital economy[2] is based on the digitalization of information and on the respective infrastructure of ICTs. This concept is the one which best defines the global impact of ICTs, not only the Internet, on the economy. From a point of view that is as much macroeconomic as microeconomic, the intersection between the technological advances and the innovations in the business processes in the firms is considered (Zysman and Weber, 2000). On the other hand, according to Kling and Lamb (1999), the digital economy is an economic sector that includes the goods and services whose development, production, sale or supply depend in a critical way on digital technologies. At present, we can speak of a new or digital economy as ICTs, especially the Internet, which are changing and will continue to change in the future the direction and organization of firms and the competition among them (Cohen et al., 2000). The digital economy is affecting the firms and organizations, the decisions of location, size, organizing structure and relations with other firms, the structure of markets, the prices of goods and services and the characteristics of the labour market, among other factors (Haltiwanger and Jarmin, 2000). In fact, the impact of the digital economy on firms and their environment (general and specific) can be considered starting from the analysis of the characteristics of the digital economy.

With the term structures (A) (see Figure 1) we refer to the changes that are being produced in inter-organizational relations and among industries derived from the use of ICTs. To be exact, we consider the phenomena of disintermediation, reintermediation and fragmentation or modulation of business activities (Zimmermann, 2000; Zysman and Weber, 2000; Shaw, 2000). On the other hand, in the digital economy, the firms begin the process (B) of creation of value under certain requirements and needs, which are very specific to the customer, and ICTs allow the firms to redefine their processes. In the digital economy, firms can create value in the virtual world by means of the collection, organization, selection, synthesis and distribution of information. The organizations can be more efficient and flexible if they move (duplicate) activities from the real value chain to the virtual value chain, redefining their business processes (Rayport and Sviokla,

In the digital economy, firms make or offer a service on request and interact with the market and specially with the customers, individualizing and personalizing the products and/or services (C) (Bloch et al., 1996; Haley et al., 1996). Similar mechanisms of coordination emerge in the market, such as auctions, buying groups or reverse auctions. The auctions or auction brokers are systems that try to bring about the bid for the sale of all kinds of products, and the buyers can be individuals or firms (for example, the firm Ibazar[3] and Ebay[4]). On the other hand, in the reverse auction, the buyer fixes the price of the product (for example, Priceline[5] and Tuhipoteca[6]). The buying groups or buyer aggregators are cyber-mediators which group together a large number of buyers interested in the same product, because in concentrating the demand they can obtain better selling conditions for the provider (for example, Acompany[7] and Consumidoresonline.com[8]) (Zimmermann, 2000; del Águila, 2000).

The firms are developing infrastructures (D) supported in ICTs, with the objective of responding to the new emerging structures, such as virtual vertical markets or business-to-business market exchange. These facilitate the interchange of information, goods and services among firms, and are new business models usually developed by large firms to optimize their business processes (Zysman and Weber, 2000; Kenney and Curry, 2000). The main infrastructures allow the development of e-business and come down to the following: planning of the firm’s resources (enterprise resource planning (ERP), developed by companies like SAP), management of relations with the customer (consumer relationship management (CRM), developed by companies like Siebel Systems) and systems of management of the supply chain (supply chain management (SCM), developed by companies like Manugistics).

Subsectors of the digital economy and levels of analysis

The digital economy groups together the sectors which facilitate physical infrastructure (hardware) and logical elements (software), and the whole set of activities defined by the term electronic commerce, in its different forms, for both tangible and intangible products (Haltiwanger and Jarmin, 2000). To be exact, four subsectors can be identified in the digital economy (Margherio, 1998; Kling, 1990, 2000; Kling and Lamb, 1999):

1. Digital goods and services. Among others, the electronic transfer of funds, online information services, digital press, the sales of software and distance learning.

2. Mixed digital goods and services. The sale, through the Internet, of books, music, flowers, or services such as bookings. In this case, the production and distribution systems for tangible goods are the same as if another interface were used with the customer: mail order catalogue, telephone, etc. The Internet is in this case a new sales channel.

3. Intensive production of goods and services in ICTs. For example: market investigations, computer-aided design and the production of tangible goods which require controls based on ICTs.

4. The industry of the ICTs. This gives support to the three former segments: hardware, software and services, communications equipment and services.

Barua et al. (1999, 2001) suggest that the digital economy is made up of those companies whose revenues are generated directly or partially by the Internet or those that offer products/services related to the use of the Internet. These authors also identify four layers or subsectors (see Table 1). In this sense, it is relevant to analyse the volume of business generated by the different layers and the growth experienced in terms of revenues and employment created. According to Barua et al. (1999, 2001), it is foreseen that the importance of layer 1 will diminish in keeping with the rate at which the world population has access to the network, and that the other layers will continue to acquire more weight within this new economy. However, within the applications (layer 2), the firms with higher growth have been the consulting ones, which shows that there is a general concern to define a strategy on the Internet. The intermediaries...
**Table 1 Subsectors of the digital economy**

**Economic and business activity**

**Layer 4: online transactions**
- This layer is made up of firms that sell products directly or offer services through the Internet to consumers or other firms.
- This indicator includes businesses that sell directly to the final consumer (B2C, business-to-consumer) or other firms (B2B, business-to-business):
  - Retail sales of books, music, clothing, flowers, etc. thorough the Web (Amazon, eToys, Sears.com)
  - Manufacturers that sell online (Dell, Cisco, IBM)
  - Online plane tickets (American Airlines, United Airlines, Iberia)
  - Entertainment (Disney.com, TrivialPursuit, Meristation)
  - Transport services (UPS, Fedex, Airborne)

**Layer 3: intermediaries**
- Market creators in vertical industries (VerticalNet, PCOrder)
- Online travel agencies (TravelWeb, 1Travel, Expedia)
- Online auctions (eBay, QXL, subasta2.com, ibazar.com)
- Online stockbrokers (E*Trade, Schwab.com, DLJDirect)
- Content developers (Cnet, Zdnet, Broadcast.com, Endemol)
- Portals (Yahoo, Excite, Geocities)
- Online advertising firms (Doubleclick, 24/7 Media)
- Malls (Dondecomprar, Netcenter)

**Infrastructure**

**Layer 2: applications**
- The products and services in this layer have been manufactured so as to work in the infrastructure of the previous layer.
- They make the online commercial activities technologically possible. In addition to computer applications, this layer includes the human capital that is necessary to make the electronic commerce and the aforementioned computer applications take off:
  - Internet consultants (USWeb/CKS, Scient, Ideas4Change)
  - Applications for electronic commerce (Netscape, MS, Sun, IBM, BEA)
  - Multimedia applications (RealNetworks, Macromedia)
  - Software for the development of applications on the network (Adobe, NetObjects, Allaire, Vignette)
  - Software for search engines (Inktomi, Verity)
  - Online education (Sylvan, Prometric, Assymetrix)
  - Databases and tools for using them online (Oracle, IBM DB2, MS SQL Server)
  - Hosting and support services (Exodus, Globix, Verio)
  - Firms which allow online transactions (Sylvan, Prometric, Assymetrix)

**Layer 1: infrastructure**
- This layer is made up of those firms which offer products or services that help build the Internet infrastructure. It includes telecommunication and fibre optic firms, firms which make hardware to access the networks and the equipment necessary for the proliferation of electronic commerce through the Internet:
  - Providers of nationwide nets (Qwest, MCI Worldcom, Infomiacus)
  - Providers of Internet or ISP services (Mindspring, AOL, Earthlink, ICTnet, Arrakis)
  - Equipment for providers of nets and services (Cisco, Lucent, 3Com)
  - Producers of optic fibre (Pirelli, Corning)
  - Hardware for users and servers (Dell, Compaq, HP)
  - Firms which guarantee security on the network (Verisign, Entrust Technologies, ACE)

**Source:** The authors, following Barua et al. (1999, 2001) and Serarols (2000, 2001)

(layer 3) with higher growth have been the online stockbrokers, the online travel agencies, the portals, the auctions and the advertisers, while the rest of the intermediaries have grown more moderately. The ten main intermediaries represent 23 per cent of the total revenues of this layer. With regards to commerce through the Net (layer 4), the growth has been very important in what is referred to as retail sales and in certain sectors. The greatest part of the revenues of this layer are still due to the computer firms; the ten most important firms represent 32 per cent of the total revenue and it must be pointed out that no new cyber-trader firm exists among the first ten. This has been the layer with the highest growth,
quadrupling its revenue with respect to the first term of 1998. It is interesting to note that the cyber-traders represent 9.6 per cent of the digital economy, generating revenues of 116,114 million dollars and creating 362,500 jobs.

**Analysis of the digital economy in Spain**

With the objective of determining the situation of the digital economy in Spain and its impact on the firm, based on the preceding theoretical bases, we propose a method of analysis from two aspects, which join together the four layers or subsectors as shown below:

(1) *Infrastructure* (OECD, 2000, 2001):
- Characteristics of the CIT sector in Spain:
  - CIT manufacture;
  - telecommunications; and
  - other CIT services.
- Relative importance of the CIT sector:
  - countries with a high intensity in CITs;
  - countries with an average intensity in CITs; and
  - countries with a low intensity in CITs.
- Number of servers connected to the Internet/1,000 inhabitants.
- Number of secure servers/million inhabitants.
- Internet servers.
- Secure servers.
- Internet multimedia contents.

(2) *Economic and business activity* (INE, 2001; AECE and MCYT, 2000; authors' empirical study):
- Sectors with greater prospects of growth.
- Factors which bring about the Internet evolution in Spain.
- Entrance barriers.
- The role of public administration.
- Development of electronic commerce.
- Presence in the Internet.
- Sales through the Internet.
- Products and services.
- Objectives.
- Impact of electronic commerce on the firms.
- Intermediaries.

For the analysis of these variables, both secondary and primary sources have been used. Among the first can be found, among others:
- the OECD;
- the Instituto Nacional de Estadística (National Institute of Statistics);
- the Asociación Española de Comercio Electrónico (Spanish Association of Electronic Commerce); and
- the Ministerio de Ciencia y Tecnología (Spanish Ministry of Science and Technology).

As a primary source, reference has been made to the conclusions in a Delphi study carried out to determine the situation of electronic commerce in Spain (Serarols, 2000).

**Infrastructure: analysis of the ICT sector in Spain**

According to the recent report *Measuring the ICT Sector*, made by the OECD (2001), in the ICT sector in Spain imports exceed exports, although in the period 1990-1998 exports grew at an annual ratio of 21.5 per cent, in relation to the 13.7 per cent growth of all the exports of goods and services. However, the imports grew an annual 10 per cent in comparison with the 10.8 per cent growth of the total imports of goods and services. In the aforementioned report, the OECD has determined the importance of the ICT sector in relation to the entire business sector of each country, starting from the following variables:
- employment;
- added value;
- investigation and development; and
- imports and exports.

According to this comparison, Spain belongs to the group of countries with low intensity in ICTs, that is, the relative importance of the sector in the whole of the economy is low. Other indicators to determine, in this case, the development of the Internet and electronic commerce are, among others, the following:
- the number of computers connected to the Internet;
- the number of secure servers (infrastructure); and
the contents of Internet multimedia (applications) (OECD, 2000). According to these data, the relative position of Spain with regards to other countries is unfavourable. The USA, Canada, New Zealand, Australia, Iceland and Sweden are above the average of the OECD in the number of computers connected to the Internet and in secure servers. Group 2, composed of Switzerland and Luxembourg, is situated above the average of all the countries of the OECD as far as secure servers, because in these countries the financial sector is traditionally very important. Group 3 has a high number of computers connected to the Internet, but is below average as far as secure servers. In group 4, in which Spain is situated, the cost of access to the Internet jeopardizes its development, and the countries in this group are below the average of the OECD, both in the number of computers connected to the Internet and the number of secure servers. The countries in this group must develop policies directed towards extending electronic commerce and the universal access to the Internet (OECD, 2000).

Electronic commerce through the Internet and new intermediaries: a business and economic perspective

In the analysis of the business and economic component of the digital economy we rely basically on Serarols’ empirical study, made on the basis of a panel of experts on electronic commerce at a national level. The definition of an expert in the above-mentioned study was the following:

... that individual whose situation and personal resources enable him to contribute a relevant input for the objectives of the study (Dalkey, 1967; Ortuígera Bouzada, 1984; Bell and Olick, 1989; Landeta, 1999).

The experts, selected from among the members of the main organizations or those involved in matters of electronic commerce, were the following:

- private organizations involved in electronic commerce and the Internet (Asociación Española de Comercio Electrónico, First Tuesday, Comercenet, etc.);

- governmental organizations (Chambers of Commerce, Ministry of Public Works, etc.);

- academics and research workers (University of Girona, University of Granada, etc.); and

- professionals and businessmen in this new economy (IBM, ICTnet, Andersen Consulting, etc.).

In general terms, according to the third study on electronic commerce in Spain carried out by the Spanish Association of Electronic Commerce (AECE) and the Ministry of Science and Technology (MCYT), it is expected that the electronic commerce intended for the final consumer (business-to-consumer, B2C) will generate a business figure of 450 million euro in Spain during the year 2001. According to Baquía Inteligencia (2001), the electronic commerce among firms (business-to-business, B2B) will generate a business figure of 2,740 million euro in the year 2001, six times more than the electronic commerce B2C.

According to the experts consulted, the sectors which are expected to show higher growth prospects in Spain, as far as electronic commerce, are the intermediaries of information, the financial services, tourism, education and computer science. According to the same source, in the future the Spanish Internet market will be dominated by the intermediaries, and among the factors, which will motivate the evolution of the Internet in Spain, are the new access technologies through mobile devices (WAP, UMTS), greater bandwidth technologies (cable) and access through the TV (interactive TV). They are followed by the lowering of access costs, reduction in prices of the products and services offered in the Internet and security. In Spain, what we could call entrance barriers to the digital economy are noticeable. Some of them are the following: lack of business culture as regards electronic commerce, consumer habits and security, the non-existence of a legal framework, the scarcity of a critical mass of users, costs, having a product which is inadequate for the channel and the technology.

As for public administrations, according to the panel of experts, these must speed up the
liberalization of the sectors involved and establish a suitable legal framework. To be exact, they refer to three groups of legal factors, which must be negotiated in order to potentiate electronic commerce through the Internet. The first priority group affects the protection of data, security, privacy and confidentiality, electronic banking, financial services and the encryption of data. The second group, of high priority, includes copyrights, contracts, Internet offences and access services to the Internet. The aspects of medium priority are the following: jurisdiction, taxes on the Internet, freedom of expression, domains and responsibility of the providers of Internet services.

From the business point of view, it is difficult to determine the number of firms which are developing electronic commerce in Spain, as official statistics only exist in relation to the sector of retail commerce: 500,000 firms (INE, 2001). According to the data of December 2000, 4.88 per cent of the firms of this sector use electronic commerce, understood as "any method of transaction or interchange of commercial information based on the transaction of data on communication networks such as the Internet". According to the same source of information, the level of the implementation of electronic commerce reached 89.19 per cent in the case of the malls. And the profile of the firm which uses electronic commerce in this sector is, broadly defined, the following: a firm located in Catalonia or Valencia, dedicated to the specialized commerce of products (leisure, health and household equipment), and with a staff of more than 20 people (INE, 2001).

However, recent data are available related to presence on the Internet. According to the study carried out by the AECE and the Ministry of Science and Technology (AECE and MCYT, 2000), 32.4 per cent of the Spanish firms have a presence on the Internet. On the other hand, and according to the panel of experts consulted in the Delphi study, the Spanish firms with greater presence on the Internet are the large ones (more than 250 workers), followed by the medium ones (51-250 workers), the small ones (5-50 workers) and finally the microfirms (less than five). If we centre on the sales process through the Internet, the larger firms are the ones that sell more. These data from the panel of experts are emphasized by the study carried out by the AECE and the MYCT (AECE and MYCT, 2000) where it can be seen that the Spanish firms with greater presence and volume of sales are the large ones, followed by the medium ones and finally the small ones.

If we analyse the presence and sales of Spanish firms in the Internet by autonomous communities, great geographical differences can be observed. For example, the firms which appear more on the Internet are those established in Madrid (44.3 per cent), the Balearic Islands (39.4 per cent), Valencia (33.5 per cent) and Catalonia (33.2 per cent), whereas at the other extreme are situated Castilla-La Mancha (17.8 per cent) and Extremadura (18.9 per cent). The firms with electronic commerce are situated mainly in Madrid (20.4 per cent), the Balearic Islands (16.5 per cent), Murcia (13.7 per cent) and Catalonia (10.9 per cent). Castilla León (2.2 per cent) has the smallest percentage of firms with electronic commerce. The products and services, which are sold most in Spain via the Internet, are, according to the panel of experts, books, digital contents, magazines, access services to information and CDs/videos. In a second group, there are the financial services, hardware, software and travel. According to AECE and MCYT (2000), the products that are bought most by the Spanish users of the Internet are books (35.2 per cent), music (35.1 per cent) and electronics (31.3 per cent).

However, in this study it is clear that the products sold most by Spanish firms[9] are food (13.1 per cent), hotel bookings, etc. (12.5 per cent) and electronics (12.3 per cent).

As additional aspects with regard to the behaviour of the firms that sell via the Internet, the following stand out (AECE and MCYT, 2000):

- A total of 24.2 per cent have their Web page integrated in a mall of firms. This is most common in the sector of great consumption (57.5 per cent) and the car industry (40.8 per cent) and less in the publishing sector (1.4 per cent).
- A total of 58.7 per cent of the firms have begun to sell through the Internet during the last year.
- A total of 43.5 per cent of the firms selling through Internet sell to other firms (B2B).
The sector of great consumption (86.4 per cent) and distribution (66.6 per cent) are the ones which are developing the B2B at the greatest extent, and the publishing sector the least (9.5 per cent).

- The majority of the firms (63.5 per cent) state that electronic commerce represents between zero and 10 per cent of the total invoicing; 48.8 per cent of the firms have generated between zero and five million euro from their sales through the Internet during the last year.

The objectives pursued by the Spanish firms in relation to the Internet tend to be the following:
- to advertise, sell their products and services;
- to open up to new markets; and
- to improve the customer services.

These objectives coincide remarkably with the results obtained by the INE (2001) and by the ACE and MCYT (2000). In the opinion of experts, electronic commerce transforms the relations of firms with their customers and redefines the products, processes and business models. Finally, in relation to the intermediaries (search motors, malls or virtual commercial centres, financial intermediaries, digital magazines, etc.) and, in the opinion of the experts, these will be the ones which will move the greater part of business in the Internet. In addition, according to the experts, the functions, which these firms develop in Spain, will be to:
- put in contact offer with demand;
- facilitate searching;
- create confidence;
- provide infrastructure; and
- create traffic.

Conclusions

The digital economy is based on the digitalization of information and on the infrastructure of ICTs. It is made up of firms which offer purely digital products and services, mixed products and services, firms which carry out the production of goods and the offering of intensive services in ICTs, together with activities defined by the term electronic commerce, and the segments of the industry of ICTs, which support the rest of the identified segments (physical and logical infrastructure).

These elements give rise to four subsectors or layers of the digital economy: (1) infrastructure; (2) applications; (3) intermediaries; and (4) commerce through the Internet.

For each of these subsectors the design and use of indicators are necessary to inform on the degree of development in the firms and to make possible comparisons among the different countries. The importance, which the digital economy is acquiring on an international level, is explained, partly, by the development during these last years of the business use of the Internet, or ICTs in general. It can be seen how the use of the Internet is bringing about significant changes in the products, processes, structures and infrastructures of the firms.

Based on the aforementioned layers grouped in two aspects, infrastructure and business and economy activity, a method of analysis of the digital economy in Spain is proposed. In making this analysis, indicators from secondary as well as primary sources are used, constructed upon information from an empirical study made on a group of experts. From the analysis of all the indicators described, it can be concluded that in Spain the sector of ICTs is of relative importance. To be exact, it can be stated that it belongs to the group of countries with “low intensity in ICTs”, in the terminology of the OECD.

With respect to the development of the Internet and electronic commerce in Spain, and according to variables like the number of servers connected to the Internet and the number of secure servers; its relative position in comparison with other countries is also deficient, as the average of the countries of the OECD is situated between 59.3 Internet servers for every 1,000 inhabitants and in Spain this number is reduced to 22.8. This means that, according to the overall classification of the OECD, Spain is situated in this group of countries because the cost of access to the Internet holds back its development. This is evident from quantitative indicators such as, for example, the number of Internet servers, which is below the average of the OCED. Therefore,
specific policies are necessary in Spain to develop electronic commerce and universalize the service. Policies such as the imposition of flat rates for access to the Internet, or rates independent of the time of connection to the network, put into practice in Spain only a few months ago, seem to be going in this direction.

As far as the business and economy activity, according to the latest statistics, the volume of business-to-consumer electronic commerce expected for the year 2001 is 450 million euro, while the business-to-business electronic commerce will be 2,740 million euro for the same period. This is because the sectors with greater expectation of growth are those of intermediaries of information, financial services, tourism, and education and computer science. The main barriers for the firms to enter the digital economy are the lack of business information as regards electronic commerce, consumer habits, security and the non-existence of a legal framework, among others. Therefore, it is important to design and approve what we could call “the norms of the digital economy” which affect aspects such as privacy, security, property rights, etc.

Other indicators related to this business and economic aspects reflect the following: in Spain the number of firms, having a presence on the Internet, is still reduced (32.4 per cent of them), and those with more presence are the large firms (more than 250 employees). The differences as far as presence on the Internet and the use of electronic commerce among the autonomous communities are noticeable. The indicators reflect that Madrid, the Balearic Islands, Valencia and Catalonia are situated, in this order, among the communities where there are more firms with presence on the Internet; and Madrid, the Balearic Islands, Murcia and Catalonia are those which have more firms using electronic commerce. The products sold most are still those based on information, such as books, magazines, digital contents, CDs, videos, financial services and also electronics (hardware and software) and travel. The experience of the Spanish firms as far as electronic commerce is limited, as only 58.7 per cent of the firms started to sell on the Internet last year.

If we apply the above-mentioned model about the Internet use, it can be stated that the majority of Spanish firms are situated in the second stage (presence on the Internet), as a preliminary step to the third (e-business). The reason for this is that their objectives in relation to the Internet are to advertise and sell their products and services and not yet to transform the business internally and externally using Internet technologies. In the analysis of the Spanish firms, it is noticeable that the intermediaries are acquiring importance, and they will presumably form a large part of business on the Internet.

On general lines, it must be stated as a final reflection that there is much to be done in order to reach the same level as other countries of the OECD, as regards the development of the digital economy and its applications in the firms. The firms will have to adapt rapidly to this new environment, passing on to the stage of integration, to the improvement of their competitiveness through the integrated application of Internet technologies, at both internal (modification of their organizational structures) and external (interorganizational relations with providers and consumers) level.

Future research may examine more managerial implications of the development of the digital economy and knowledge society. It is necessary to examine the influence of intangible factors on the success of companies at this time, because the infrastructure or technology is not enough. Furthermore, the role of the new intermediaries in the development of new products and services for business may be considered. Moreover, more contributions, both theoretical and practical, are necessary in order to build the above-mentioned norms of the digital economy, so important for the new environment.

Notes


2 It must be specified that the concept of digital economy is wider than that of information economy (Katz, 1988; Kling, 1990), defined as all the informational goods and services, including publications, leisure, research, legal services,
insurance and education. The digital economy includes means of production, which are excluded from the information economy, such as computerised manufacturing.

3 See www.ibazar.es
4 See www.ebay.com
5 See www.priceline.com
6 See www.tuhipoteca.es/
7 See www.acompany.com
8 See www.consumidoresonline.com/
9 Percentage of firms that sell each type of product.

References


**Further reading**


