Community Survey on ICT Usage and E-commerce in Enterprises

Methodological report

Index

INE. National Statistics Institute

1. Introduction

The rapid development of Information and Communication Technologies (ICT), its incremental use in enterprises, public administrations and households and, more notably, the strong growth of Internet have had a significant economic and social impact.

Statistics on the Information Society (IS) are themselves a new statistical field that deals with the development and repercussion of the use of ICTs in the economy and society. More specifically, the statistics on the Information Society encompass issues related to the production, preparation for use and impact of ICTs, and of digital content services.

The statistics on the IS maintain links with:

– The Knowledge Society, as the IS influences and is influenced by innovation, research and development (R&D) activities and learning.

– The National Accounts for measuring the global impact of the IS on the economy as a whole.

– Business statistics, referring to the measurement of the impact of the use of ICTs on business activity.

– Social statistics, regarding the measurement of the level of equipment in households and the degree of use and utilisation of the ICTs in them.

2. Background

From the historical point of view, the term, "Information Society" took off in 1973, termed by American sociologist Daniel Bell in his book entitled, "*The Coming of Post-Industrial Society"*. Said book establishes that the main basis of this society will be theoretical knowledge, and warns that those services based on knowledge will have become the central structure of the *new economy* and of a society sustained by information, where ideologies would be unnecessary.

In 1990, the expression of *IS* was renewed within the context of the development of the Internet and the ICTs. As of 1995, it was included in the agenda of the meetings of the G7, the European Community, and the Organisation for Economic Cooperation and Development (OECD). In parallel, it was also adopted by the United States government, as well as by several agencies of the United Nations and the World Bank Group.

One of the first strategic documents, regarding how for European countries to face the challenges of the ICTs and the IS, was the *"Europe and the global information society (1994)"* report, also known as the ***Bangemann Report***, in honour of the name of the European commissioner who backed it. This text advocated, among other things, for the liberalisation of telecommunications and the audiovisual sector, the development of technological innovations and cultural pluralism.

The growth and development of the ICTs and infrastructures sustaining them have at the same time been accompanied by an increase in their applications and in the dissemination of their use in developed economies.

The need for having statistical information available regarding the IS has increased notable in recent years. Moreover, said information must be varied and variable over

time. With the objective of alleviating the scarcity of data on this subject various projects have been started in national and international statistical institutions.

Thus, the Organisation for Economic Cooperation and Development (OECD) created different groups called "Workshops on the Information Economy" under the direction of the *Committee for Information, Computer and Communications Policy* (ICCP), with the objective of establishing IS empirical economic research and obtaining quantitative information. These workshops began their activity in 1995.

Subsequently, a statistical panel was created, formed of experts from OECD Member States, in order to advise the ICCP committee about the statistical programme and development of the appropriate indicators for ascertaining global tendencies in IS development. Similarly, the panel attempted to promote cooperation between national and international statistical institutions and coordination of the work of the different bodies involved.

The "Working Party on Indicators for the Information Society (WPIIS)" *took place* in April 1999. From the work that has been undertaken by this Group, it is worth highlighting the definition of e-commerce (EC), the definition of the ICT sector and the proposal of two questionnaire models to study e-commerce and the impact that the use of ICTs has had on enterprises and households.

In turn, in the Statistical Office of the European Communities (Eurostat), the "*Working Group on Information Society Statistics* (WGISS)" was set up with the objective of investigating the core activities of the IS. Their first jobs were aimed at collecting information available in different Member States via the so-called Information Society Questionnaire.

All the above steps led to the start-up of the **European Strategy**, under the different versions of the **eEurope Action Plans**. The first of them was adopted in Lisbon, in June 2000 (**eEurope-2000 Plan**), for the purpose of the Cumbre de Feira, and yielded the so-called "**Lisbon Strategy**"), created in order to place the European Union within the group of most dynamic and competitive knowledge economies in the world in the decade from 2000 to 2010.

The main aim of eEurope-2000 was the creation of "*An IS for All*," through attained three basic objectives:

1. To take the digital era and communication in line with each citizen, household and school to each enterprise and administration.
2. To create a Europe that dominated the digital scope, based on an entrepreneurial spirit willing to finance and develop new ideas.
3. To ensure that the whole process is socially integrating, verify consumer trust and reinforce social cohesion.

The following plan, registered directly in the framework of the Lisbon Strategy, was the **eEurope-2002 Action Plan**, passed in Stockholm in March 2001. Its main objects were focused on the promotion of the increase in the number of Internet connections in Europe, the opening of a set of communication networks to competition and the incentive for using the Internet, highlighting the training and protection of consumers. With this, by the end of 2002, the following had been achieved:

1. Faster, cheaper and more secure Internet.

2. More investment in persons and in training.

3. Stimulus in the use of the Internet.

Subsequently, in June 2002, in Sevilla, the European Council passed **eEurope Action Plan 2005**. The main priority of this plan was to stimulate the development of services, applications and content, at the same time accelerating the deployment of secure **broadband** Internet access, that is, a high-speed, permanent Internet access, which had to be access for all, for the purpose of fighting social exclusion, linked to special needs, disability, age or illness. All the above was to contribute to achieving the following by the end of 2005:

1. Public modern online services.

2. Online administration*("e-government")*.

   a. Electronic learning services (*"elearning"*).

   b. Electronic health services (*"e-health"*).

3. A dynamic framework for electronic business ("*e-business"*), a secure information infrastructure.

4. Massive availability of broadband access at competitive prices.

It may be stated, with no chance of error, that the objective of these first initiatives was to expand the benefits of the IS to all citizens of the Union, developing modern public services, and creating a dynamic environment for electronic commerce through a broad availability of broadband access at competitive prices, and a secure information infrastructure.

The re-launching of the Lisbon Strategy led to the European Commission passing a new political agenda in June 2005 in the area of the IS, which became known as **i2010 Strategy**. Said strategy had, as objectives linked to the economic and social growth of Europe, accenting the contribution of the ICTs to the economy, socity and quality of personal life. In particular, the goal was the promote knowledge and innovation in order to encourage growth and the creation of employment, both qualitatively and quantitatively. To this end, the milestones to be reached before 2010 were:

1. The achievement of a single European space for information;

2. The encouragement of innovation and of investment in the field of research in information and communication technologies (ICT), and

3. The achievement of an IS and the communications media based on inclusion.

In parallel, integrated within the i2010 Strategy, and in response to a broad spectrum reaching those activities relating to the IS, together with the importance, for the government, of counting on an efficient and effective means for relating to citizens based on Information Technologies, in the year 2005, the European Commission developed a specific plan to encourage the Electronic Administration within the scope of the European Union. This first plan was called the "**i2010 Electronic Administration Action Plan**". The objectives of the action plan were linked to achieving the five priorities of the Manchester Ministerial Declaration, that is:

1. Internet access for all

2. Greater efficiency in the administration.

3. High-impact *eAdministration* services

4. Establishment of key tools, and

5. Greater participation in the democratic decision-making process.

In March 2010, the i2010 Strategy was reformulated, and the so-called **Europe 2020 Strategy** entered into force. Its main objective was to collaborate in ending the crisis, giving a new push to the IS, considering this to be a cornerstone of a society that is inclusive, intelligent and sustainable. In this sense, the following quantifiable achievements were established to be attained for 2020:

1. Employment: 75% of the population aged 20 to 64 years old must be employed.

2. Research and innovation: 3% of European Union GDP must be invested in R&D.

3. Climate change and energy.

4. Education: the percentage of school leaving must be less than 10%, and at least 40% of the youngest generation must have completed higher education.

5. The fight against poverty: the risk of poverty must be a threat for 20 million fewer persons.

In order to achieve said priority objectives, the Commission proposes seven emblematic initiatives to catalyse progress in each one of them:

– "*Union through innovation*", so as to improve access to financing in research and innovation, and guarantee growth and employment.

– "*Youth in movement*", in order to improve the results of the educational systems and enable the entry of young persons into the labour market.

– "*A Digital Agenda for Europe*", for the purpose of accelerating the high-velocity Internet offering, and a single digital market for families and enterprises.

– "*A Europe that efficiently uses resources*", to lower carbon emissions, increase the use of renewable energy sources, modernise our transport sector and promote energy efficacy.

– "*An industrial policy for the globalisation era*", in order to support SMEs, and the development of a strong and sustainable industrial basis, capable of competing on a worldwide level.

– "*Agenda of new qualifications and jobs*", so as to modernise the labour markets and potentiate the independence of persons, through the development of abilities throughout their life, for the purpose of increasing labour participation and better adapt the supply and demand for jobs, in particular through labour mobility.

– "*European platform against poverty*", to guarantee social and territorial cohesion.

From among all the initiatives, without detracting from each of them separately, the **Digial Agenda for Europe** has been one of the most relevant initiates, as reflected in the *Ministerial Declaration of Granada for the European Digital Agenda, agree on 19 April 2010*.

By means of this European Digital Agenda, we have tried to plot a course that allows, in the time period established by the Europe 2020 Strategy, maximising the economic and social potential of the ICTs, and in particular of the Internet, as an essential support for economic and social activity. To this end, a total of 101 actions are defined in this area, distributed into seven blocks or pillars, as follows:

Pillar 1: Establishment of a single, dynamic digital market.

Pillar 2: Inter-operability of the services and goods in Information Technology and development of rules that enable this.

Pillar 3: Confidence and security.

Pillar 4:- Rapid and ultra-rapid Internet access.

Pillar 5: Promotion of Research and innovation.

Pillar 6: Promotion of digital literacy, training and inclusion.

Pillar 7: Application of ICTs to social challenges, such as climate change or the promotion of cultural diversity.

As a fundamental part of the European Digital Agenda, there is the reorientation of the line of action in the area of the Electronic administration, agreed on in the Malmö Declaration (Sweden, November 2009), leading the European Commission to the design of the new "**2011-2015 Electronic Administration Action Plan for Europe**", whose main objective is to use the benefits and abilities associated with the ICTs to reinforce the efficacy, dynamism and sustainability of intelligent administration in Europe.

In order to achieve this objective, the European Commissions establishes four types of action to carry out, within the framework of the priorities established by the Malmö Declaration. Said actions are as follows:

Action (Priority) 1: User training, increasing the ability of citizens, enterprises and other organisations to behave proactively in society, through the use of new technological tools.

Action (Priority) 2: Reinforce the domestic market by means of the creation of an infrastructure that promotes the trans-border action of business activity and enables the mobility of persons within the European scope.

Action (Priority) 3: Increase the efficiency and the efficacy of the administrations through the improvement of the organisational processes, the reduction of the administrative loads and the encouragement of the ecological public administration.

Action (Priority) 4: Create prior conditions for the development of the electronic administration via the boostering of inter-operability, or ability of systems and coordinates the exchange, process and correctly interpret the information; the facilitation of the identification and authentification, and finally of the innovation in the electronic public administration, so that this can be adapted to the evolution of the IS.

In parallel to the approval of the different action plans, the sets of indicators enabling characterising the degree of compliance with the objectives established in said plans and the quantification of the achievements obtained by the proposed dates were established.

In this sense, we must specifically mention **Benchmarking i2010** and **Benchmarking i2011-2015**, which account for the reference indicators for both action plans.

Regarding reference framework i2010, the indicators comprising it are organised in the following groups and subgroups:

A. European Information Space:

Issue 1: Development of broadband.

Issue 2: Advanced services.

Issue 3: Security.

Issue 4: Impact.

B. Innovation and Research in the ICTs:

Issue 5: Expenditure of research in ICT.

Issue 6: Adoption of ICTs by enterprises.

Issue 7: Impact of the adoption of ICTs by entreprises.

C. Inclusion, Public Services and Quality of Life:

Issue 8: Inclusion.

Issue 9: Electronic **administration.**

On the other hand, the set of indicators for reference framework i2011-2015 are structured around the following blocks:

A. The ICT Sector.

B. Broadband and Connectivity.

C. Use of ICTs by households and Individuals.

D. Use of ICTs by Enterprises.

E. *eAdministration* services.

3. Development of the SICTEC in the INE

The National Statistics Institute (INE) has been involved in the Working groups of the OECD and Eurostat. The first real study carried out took the form of a working document on the ICT sector. Almost in parallel, in order to measure in the short term e-commerce sales in the retail trade, a module of questions was included in the Retail Trade Survey questionnaire. With reference to the year 2000, a module of questions was attached to the Technological Innovation in Enterprises Survey and the Annual Services Survey.

Given the scarcity of information regarding e-commerce, in November 2000, a questionnaire module was presented, based on the questionnaire proposed by the OECD, in order to carry out a pilot study on the e-commerce in EU countries. In the meeting of October 2001, the results of this study were laid out and it was agreed to carry out two new surveys, one on the use of ICTs in enterprises, centred on e-commerce, and the other on the use of ICTs in households, both referring to 2001.

The Electronic commerce Pilot Survey carried out in the year 2001, whose reference year was the year 2000, constitutes the immediate predecessor of the Survey on the use of ICTs and Electronic Commerce (SICTEC). That survey was intended as a pilot study aimed both at obtaining a more adequate methodology for the study of the phenomenon at hand, and at obtaining some first statistical results. The pilot study was carried out by thirteen Member States, including Spain. It targeted 5,600 enterprises belonging to the

activity branches of the manufacturing industry, trade, accommodation, transport, financial intermediation and real estate and rental activities. The experience acquired in said survey served to clarify and complete the questionnaire content, and be able to determine several technical aspects relating to the study scope, sampling design, questionnaire content, definitions, response rates, etc.

In the year 2002, the Member States of the EU carried out, for the first time, SICTEC 2001, with harmonised criteria for the writing of the questionnaire and estimation of variables, for the purpose of achieving a general perspective of the implementation and use of ICTs and electronic commerce within the European area and the preparation of the indicators for the corresponding reference frameworks for measuring compliance with the European strategies within the scope of the IS.

Once the general questionnaire was structured, the subsequent editions of the SICTEC have been developed using this same structure.

4. European Legislation

In the year 2004, European Parliament and Council Regulation No. 808/2004, of 21 April 2004, was passed, regarding community statistics of the IS.

The objective of this Regulation is to create a common framework for the systematic production of community statistics of the IS.

The Regulation considers the collection of most of the statistical information necessary for the compilation of the indicators for the corresponding reference framework. Moreover, it collections all that information necessary for analysing the IS in a given short term, both in enterprises and in households.

Each year, and over the agreements adopted within the heart of the Eurostat Working Group on IS Statistics, a legal act is prepared, specifying the criteria for implementing the Regulation. This document details the area of study and the variables to study during the period, both for enterprises and for households. This document is published in the European Union official journal.

Section 5.4 Variables and their definition includes the most important modules that have been asked during the survey years, although not all of them are compulsory according to the European Regulation or appear in every edition of the survey.

This regulation has now been replaced by Regulation 2019/2152 of the European Parliament and of the Council.

5. Specific methodology

5.1 OBJECTIVE

The objective of the SICTEC is to analyse, using the research on a sample, the implementation and use of the information and Communication Technologies (ICT) and Electronic Commerce in the business sector.

The fact of using a methodology that is widely accepted internationally allows for reaching the objective of international comparability of the results obtained, and contributing our national experience to those studies regarding the implementation of the IS in enterprises.

5.2   SURVEY SCOPE

The scope of the survey is defined with regard to the population studied, to the time and to the area.

The SICTEC uses a questionnaire model that has been send to all enterprises in the sample (including those with fewer than 10 wage earners, a stratum that is considered to be optional among the INE commitments to Eurostat).

Population scope

The SICTEC studies the population comprising all enterprises whose main activity is described in sections C, D, E, F, G, H, I, J and L, divisions 69 to 75 of section M, section N and group 95.1, according to CNAE-2009.

That is, the sectors to be analysed are the manufacturing industry, supply of electrical energy, gas and water, construction, wholesale and retail trade, repair of motor vehi-cles and motorcycles, transport and storage, accommodation services, food and bev-erage services, information and communications, real estate activities, professional, scientific and technical activities, administrative and support services activities, and repair of computers and communications equipment.

The complete list of sections, divisions and groups is presented in Table 1 below

Time scope

THE SICTEC is an annual survey, which in order to guarantee the objective of the international comparability of results, has two reference periods. On the one hand, the variables for the infrastructure, equipment and use of ICTs refer to the first quarter of the year of collecting data (t).

On the other hand, the variables regarding electronic commerce, as well as those for the general information on the company, refer to the entirety of the year t-1. The data relating to employment is requested as an annual average for t-1.

Geographical scope

All of the statistical units located in Spain constitute the research subject.

Table 1. Population scope of the SICTEC survey, according to CNAE-2009

Tract	Division	Group	Class	Name according to CNAE-2009
C	10-33			MANUFACTURING INDUSTRY
	10-18			Manufacture of food products; Manufacture of beverages; Manufacture of tobacco products; Manufacture of textiles; Manufacture of leather and related products; Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; Manufacture of paper and paper products; Publishing activities; Printing and reproduction of recorded media.
	19-23			Manufacture of coke and refined petroleum products; Manufacture of chemicals and chemical products; Manufacture of basic pharmaceutical products and pharmaceutical preparations; Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral products.
	24.25			Manufacture of basic metals; Manufacture of fabricated metal products, except machinery and equipment.
	26-33			Manufacture of computer, electronic and optical products; Manufacture of electrical equipment; Manufacture of machinery and equipment n.e.c.; Manufacture of motor vehicles, trailers and semi-trailers; Manufacture of other transport equipment; Manufacture of furniture and other manufacturing industries; Repair and installation of machinery and equipment.
D	35			ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY;
E	36-39			WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES
F	41-43			CONSTRUCTION.
G	45-47			WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES.
H	49-53			TRANSPORTATION AND STORAGE
I	55			ACCOMMODATION
	56			FOOD AND BEVERAGE SERVICE ACTIVITIES
J	58-63			INFORMTION AND COMMUNICATIONS
L	68			REAL ESTATE ACTIVITIES
M	69-74			PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES
				Professional, scientific and technical activities, with the exception of veterinary activities.
N	77-82			ADMINISTRATIVE AND SUPPORT SERVICES ACTIVITIES
	77-82 (WITHOUT 79)			Rental and leasing activities, Employment activities, Security and investigation activities, Services to buildings and landscape activities and Office administrative, office support and other business support activities.
	79			Travel agency, tour operator and other reservation services and related activities.
S		95.1		Repair of computer and communication equipment

5.3 STATISTICAL UNIT

The statistical unit of analysis may be defined as the element or component of the target population to which the tabulation of data and the aggregated statistics obtained as a result of the surveys refer.

The statistical unit of analysis for the SICTEC is that company that carries out, as its main economic activity, any of the activities included in the population scope referred to above.

A company is understood to be any legal unit constituting an organisational unit for the production of goods and services, and which has a certain independence in terms of decision-making, mainly when using the current resources it has available. From a practical point of view, and more generally, the concept of company corresponds to that of the legal unit, that is, with all individuals or companies (corporations, cooperatives, etc.) whose activity is recognised by Law, and are identified by their corresponding tax identification number (NIF). A company may carry out one or more activities in one or more local units.

It is important to remember that the data from the questionnaire must refer to the company as a whole, that is, including all those establishments that the company might have located in places other than that of the central headquarters.

5.4 VARIABLES AND THEIR DEFINITION

Company's main economic activity

The economic activity carried out by a company is defined as the creation of added value through the production of goods and services. The main economic activity is understood to be that which generates the greatest added value. Considering the difficulty implied for companies in calculating added value when they carry out several activities, the main activity is considered to be that which generates the greatest turnover, or failing this, that which employs the most persons.

Dimension or size of the company

The size of companies is one of the most important variables when it comes to identifying companies' behaviour. This dimension may be established in terms of the magnitude of the turnover or the production value, or by considering the number of persons who comprise the company's staff. As a result, the questionnaire for the SICTEC includes both questions, in order to quantify both variables.

A. General information of the company

I. PERSONNEL EMPLOYED IN THE COMPANY

This is the number of persons who work in the company, as well as the number of persons who, working outside of the company, are part of the company's staff and are paid by the company (for example, trade representatives and personnel dedicated to the delivery of orders, repair and maintenance who work for the company). This includes paid, unpaid and independent personnel.

Paid employed personnel includes those workers linked to the company by a work contract, and who are paid with set or periodical amounts in the form of a salary, wages, commission, piecework pay or payment in kind. This may be permanent staff (with a

permanent contract or labour link) and temporary staff (with a temporary contract). A worker from a temporary employment agency is an employee of the agency and not an employee of the unit (company) where they work.

Also considered as paid personnel are: those students with a formal commitment, by which they contribute to the production process of the company in exchange for payment and/or educational services, those employees hired through a contract that is specifically intended to encourage the hiring of unemployed persons, in-house workers if there is an explicit agreement in the sense that they are paid according to the work that they do and they are included on the payroll.

Paid personnel also includes part-time workers, seasonal workers and persons on strike or who have been on a short-term leave of absence, but excludes those who have been on a long-term leave of absence.

Those persons who actively manage or participate in the company's work activities but do not receive fixed remuneration or a salary constitute *unpaid personnel*. Self-employed personnel are included in this type of personnel.

Independent personnel (freelancer) or individual businesspersons are considered to be those individuals who habitually, personally and directly carry out the economic activity for payment, without a work contract, though using the paid service of other persons.

Responsibility of the freelancer is unlimited, being liable for business activities in terms of all their present and future assets, such that no distinction is drawn between the personal assets and that of the company.

II. TURNOVER

This includes those amounts invoiced by the company during the reference year, due to the provision of services and sales of goods that are the object of activity of the company. Sales are recorded without including the VAT charged to the client.

These are counted in net terms, deducting returns of sales, as well as rebates on sales. Not deducted are cash discounts, nor discounts for prompt payment. Turnover does not cover the sale of fixed assets or production subsidies received. The amount of turnover is calculated as the sum of net sales of goods and the rendering of services.

III. NET PURCHASES OF GOODS AND SERVICES

Net purchases of goods and services represent the value of all of the goods, other than investment goods, and services acquired during the reference year, earmarked for resale, in the state in which they were acquired, or following transformation and integration into the products to be sold, or intended for consumption in the production process or in the current functioning of the company. Not included is the acquisition of capital goods whose consumption is registered as investment.

Purchases of goods include merchandise (goods acquired by the company in order to resell them, in the same state in which they were acquired without being subjected to transformation), raw materials (goods acquired for transformation during the production process (intermediate products, components, spare parts) and other provisions (fuels, packaging, containers, office material).

Purchases of services include the work carried out by other companies or professionals for the company. In other words, it considers the value of the tasks that, being part of the

company's production process, are commissioned to and carried out by other companies or professionals.

This includes expenses belonging to the External Services account, that is, expenses on rentals, repair and preservation, independent professional services (technical studies, legal and accounting fees), transport services of goods and personnel, insurance premiums, banking services and the like, advertising, propaganda and public relations, supplies (expenses on the post, telephone, electronic communications, telegraph and fact communications, etc.).

Purchases of goods and services are valued at the acquisition price, excluding deductible VAT. As with sales, they are counted in net terms, that is, subtracting rebates on purchases, discounts due to qualify defects or remittances returned to the supplier.

B. COMPUTER USE

ICTs are understood to be the set of tools, customarily of an electronic nature, used for the collection, storage, processing, dissemination and transmission of information.

ICTs are considered to be both physical devices (computer equipment, communications networks, terminals, etc.) and software or computer applications that run on these devices.

This section aims to obtain information on the use made by companies of technological devices such as desktop computers, laptops, tablets, smartphones, etc.

Information is requested regarding the computing resources of the company's staff (personnel that uses PCs for business purposes).

It also asks about the use of open source software typologies (operating systems, internet browsers, office applications, web/internet servers,...); about the limitations the company has to use open source software.

C. ICT EXPERTS AND PROFILES

In this section, the informant must specify whether the company employs ICT specialists and whether the company provided training activities in order to develop and improve the ICT skills of their staff.

Since the 2017 edition, the percentage of women ICT experts in the company is required.

Moreover, the informant is asked whether ICT specialists were hired – or an attempt was made to- and whether difficulties arose when trying to fill an ICT specialist vacancy. The type of difficulty experienced by the company is also requested.

D. INTERNET ACCESS AND USE

This section intends to measure Internet use, that is, to quantify the main characteristics associated with Internet use by companies, and the reasons why the company does not have such a service.

As regards Internet access, information is requested on the different types of Internet connections: connection Fixed and and connection through mobile telephone networks.

For the *Fixed Connection to the Internet*, information must be broken down into three items: DSL connection (ADSL, HDSL, SDSL, VDSL…), Cable and fibre optic networks (FTTP) and Other fixed connections (PLC, leased line, satellite…). Information is also

requested regarding the maximum download speed contracted for the Fixed Connection to the Internet, and whether this speed is sufficient to cover the company's needs

On the other hand, the *Mobile Internet connection* refers to Internet access using mobile devices through mobile connection networks.

Mobile devices allowing an Internet connection are as follows:

− Portable computers (notebook, netbook, laptop, tablet PC, etc.)

− Other portable devices (smartphone, PDA phone, etc.)

Information is requested on the use of mobile Internet connection and its use through such devices, and on staff using them for business purposes.

Information is requested on the use of mobile Internet connection and its use through such devices, and on staff using them for business purposes.

Another aspect to bear in mind in the study of Internet use by companies is to ascertain whether the company has a website/page, as well as what services it offers online, distinguishing between the following: presentation of the company, privacy policy statement, ease of access to product catalogues or price lists, possibility of clients customising or designing products, carrying out online orders or reservations, carrying out online payments, online monitoring of orders, customisation of the website for regular clients, and advertising of job vacancies or online receipt of job applications.

The company is also asked whether it allows teleworking by its employees and the percentage of employees who telework regularly per week, whether teleworking is a new practice derived from covid-19 and whether the percentage of employees who telework for the same reason has increased.

Furthermore, this section requests information regarding the use of Social Media (SM) or technology-based Internet applications or communication platforms in order to connect, create or exchange content online with clients, suppliers/partners, or within the enterprise itself as part of carrying out the activity.

It also includes a question about whether the company used an electronic signature in any communication sent from its company to interact with its clients and/or suppliers or with the Public Administration.

E. EXCHANGE OF INFORMATION BY ELECTRONIC MEANS WITHIN THE COMPANY

Information within the company is integrated when it is shared electronically and automatically between different areas, using a single software tool or several tools that share information extracted from a common database.

In this regard, the reporting unit is asked to answer whether or not it has an ERP (Enterprise Resource Planning) or CRM (Customer Relationship Management) software tool. The former allows the integrated management of processes and information corresponding to the different business areas of a company. The latter are dedicated to the integrated management of customer information.

F. CLUOD COMPUTING

This section is included to collect information on the company's use of the technology model. It is a technology model that allows ubiquitous, tailored and on-demand networked access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services); examples of cloud computing solutions are Dropbox, Google appEngine, Microsoft Azure, Vcloud, eyeOS,...).

G. INTERNET OF THINGS (IoT)

The Internet of Things (IoT) refers to interconnected systems or devices, often called "smart" systems or devices, that collect and exchange data and can be remotely monitored or controlled over the Internet.

The objective of this module is determine both the use and the characteristics of IoT systems and devices.

H. INTELIGENCIA ARTIFICIAL

Through this module, the use of artificial intelligence systems is measured.

Artificial intelligence systems can be purely software-based or embedded in devices.

The company is asked to provide information on the purpose of use and how it acquired the software or AI systems it uses.

I. BIG DATA ANALYSIS

Big Data is data generated from activities carried out electronically and from Machine to Machine (M2M) communications (e.g.: data generated from social media activities, processes).

Big Data analysis refers to the use of techniques, technologies and software tools to analyse large datasets extracted from sources within the company itself and from other sources.

In this section, the informant must indicate aspects such as the use, possible outsourcing, training and sale of Big Data activities by the company.

J. SEGURIDAD TIC

The main objective of this module is to understand the ICT security measures employed by the company, i.e. controls and procedures applied to ICT systems to ensure the integrity, authenticity, availability and confidentiality of data and systems.

K. E-COMMERCE

Electronic commerce (*eCommerce*), is understood to be all those transactions carried out through networks based on Internet protocols (TCP/IP) or over telematic networks other than the Internet.

Goods and services are procured or reserved over these networks, buy payment or distribution may be off-line. Moreover, except where it involves a digital product (digital good or service), goods will reach their addressee generally via traditional distribution channels.

Orders carried out by telephone, fax or email and registered manually are not considered to be electronic commerce. Structured forms on some websites for placing an order to the company, and which are handled as e-commerce ARE included.

The structure of this block comprises two sections: purchases by e-commerce and sales by e-commerce.

Purchases are structured in two blocks: (1) those purchases made via an online store or website or extranet or mobile applications, and (2) those purchases made via Electronic Data Interchange (EDI)-type messages, in a format agreed upon that may be processed automatically.

Purchases are broken down by geographical area: Spain, other countries in the EU and the remaining countries not belonging to the EU.

Sales are structured in two blocks: (1) Web Sales: sales made through (1a) the website or mobile application (app) or (1b) via digital platform (marketplace) and, (2) EDI Sales: sales made through messages like Electronic Data Interchange, in a format agreed upon that may be processed automatically.

In both cases, sales are broken down by type of customer and by geographical area.

It is also asked whether, in web sales, the company experienced difficulties related to ICT security or data protection.

L. EXPENDITURE ON ICT

It includes the expenses made on ICT products, broken down by group of products.

Said information divided into four sections:

- Total expenditure on ICT goods.

- Total expenditure on Standard or custom software.

- Total expenditure on ICT services and consultancy.

- Other ICT expenses.

M. INTERNAL R&D ACTIVITIES

The objective is to ascertain the creative work carried out within the company, which is undertaken systematically in order to increase the volume of knowledge to develop new applications, such as products (goods and services) and new or significantly improved processes of companies with less than 10 employees.

5.5 SURVEY FRAMEWORK AND SAMPLING DESIGN

Framework

The population framework of the survey is the Central Business Directory (CBD). This is an organised register with information containing data on the identification, localisation, territorial distribution and classification by size and economic activity of the company-type units, obtained from administrative sources and complemented by other information from the current statistical operations of the INE.

This directory, updated annually with the information supplied by the Tax Agency and Social Security, as well as with the information obtained from the INE surveys themselves, meets the conditions necessary to be used as the bases of the SICTEC.

From the aforementioned Directory, the population of companies object of this survey, according to the previously defined population scope, has been stratified on a national level, according to the crossing of the following variables:

1. ***Size of the company***, according to the number of employees. The following brackets are considered:
   − From 0 to 2
   − From 3 to 9
   − From 10 to 19
   − From 20 to 49
   − From 50 to 99
   − From 100 to 199
   − From 200 to 499
   − 500 or more

2. ***Branches of activity*** according to CNAE-2009, offered in detail in Table 1.

3. **Autonomous Community or Autonomous City** in which the company's registered office is located. This considers the following:
   − Andalucía
   − Aragón
   − Asturias, Principado de
   − Balears (Illes)
   − Canarias
   − Cantabria
   − Castilla y León
   − Castilla-La Mancha
   − Cataluña
   − Comunitat Valenciana
   − Extremadura
   − Galicia
   − Madrid, Comunidad de
   − Murcia, Región de
   − Navarra, Comunidad Foral de
   − País Vasco
   − Rioja, La
   − Ceuta
   − Melilla

Sample size:

The final sample obtained includes 25,000 companies (14,611 with 10 or more employees and 10,389 with fewer than 10 employees).

Table 2 presents the distribution of the sample, according to CNAE-2009 and the size of the company.

Table 3 presents the distribution of the sample, according to the Autonomous Community and the size of the company.

Table 2. Distribution of the sample, according to CNAE-2009 and size of the company

CNAE 2009	Number of employees				
	0 to 9	From 10 to 49	From 50 to 249	250 and more	Total
Total	**10,389**	**7,622**	**4,039**	**2,950**	**25,000**
C. Manufacturing industry	912	2,,012	1,177	711	4,812
D, E. Electricity, gas, steam and air conditioning supply, Water supply, sewerage waste management and remediation activities	142	216	130	111	599
F. Construction	1,430	805	282	98	2,615
G. Wholesale and retail business; repair of motor vehicles and motorcycles	3,105	1,724	790	522	6,141
H. Transport and storage	899	588	316	246	2,049
I. Accommodation	791	464	274	229	1,758
J. Information	667	362	228	231	1,488
L. Real estate activities	486	191	65	17	759
M. Professional, scientific and technical activities	1,091	564	327	300	2,282
N. Administrative and support services activities	696	671	440	476	2,283
Group 95,1. Repair of computer and communication equipment	170	25	10	9	214

Table 3. Distribution of the sample, according to the Autonomous Community and size of the company

Autonomous Community	Number of employees		
	0 to 9	10 and more	Total
Total	**10.389**	**14.611**	**25.000**
Andalucia	878	1.405	2.283
Aragón	497	569	1.066
Asturias	466	396	862
Baleares	523	553	1.076
Canarias	574	729	1.303
Cantabria	427	316	743
Castilla y León	560	621	1.181
Castilla-La Mancha	546	553	1.099
Cataluña	971	2.233	3.204
Comunidad Valenciana	751	1.284	2.035
Extremadura	473	319	792
Galicia	590	779	1.369
Madrid	882	2.567	3.449
Murcia	499	575	1.074
Navarra	437	413	850
Pais Vasco	553	943	1.496
La Rioja	382	248	630
Ceuta	176	60	236
Melilla	204	48	252

Estimators

The estimator of the total of a characteristic X in domain m is given by:

$$\hat{X}_m = \sum_{j \in m} X_j \cdot F_j$$

where:

Xj is the value of characteristic X in questionnaire j belonging to domain m.

Fj is the elevation factor from questionnaire j which is calculated as follows:

$$F_j = \frac{N_h}{n_h}$$

$$F_j = \frac{\hat{N}_h^*}{n_h^*}$$

c) In the specific cases in which it is specified that $F_j=1$.

Variables used

N_h, number of companies in the directory in stratum h.

n_h, number of companies selected in stratum h.

n^*_h, number of companies that have replied, that were selected in stratum h and that have not changed stratum.

$$\hat{N}^*_h = N_h \left(1 - \frac{n''_h}{n_h}\right) - \sum_{k \neq h} \sum_{j=1}^{n^k_h} F_j$$

where:

n''_h, number of companies selected in stratum h and having duplicate or inactive type incident.

n_{kh}, number of companies selected in stratum h, and which are in a different stratum k, according to the questionnaire.

Sample errors are also calculated by expressing the variation of the estimator of the total stratified sample.

5.6. INFORMATION COLLECTION

The information is collected during the first quarter of the year of publishing by the information collection units (URCEs) of Valencia, Madrid, Ciudad Real and the Large Enterprise Unit, which send it to the Centralised Collection Unit (URCE), which in turn submits it to the responsible department.

The INE contacts the respondent in order to remind them of the benefits of completing the questionnaire online, this being the fastest and most secure method. Nonetheless, if the respondent wishes to receive the questionnaire in print format, they may request it and it will be sent to them.

The personnel in the collection units, in accordance with the previously established work quotas, carried out the collection tasks, targeting those companies that had not completed the questionnaire online or by post, for the purpose of asking them for the information, advising them as necessary and obtaining the completed questionnaire.

Following the calendar for the fieldwork and the quality control of the information obtained has been carried out each fortnight from the Central Services of the INE through the reports on the situation and the analysis of the information contained in the files submitted by the URCE with the recorded and filtered questionnaires.

5.7 PROCESSING OF RESULTS

The information-processing phases were the following:

Control and cleaning of the questionnaire by the units that carry out the fieldwork, for the purpose of recovering the possible lack of data or correcting the errors in the questionnaires prior to their recording and posting to the Central Services.

- Interactive recording with filtering and error correction of the information obtained by the units carrying out the fieldwork.

- Control of the information received in the responsible department.

- Control of coverage and processing of identification errors.

- Validation of the quality of the information.

- Filtering and interactive correction of inconsistencies in the validated information.

- Preparation of a first phase of tables analysing the results.

- Macro-edition of the main aggregates in order to correct those errors not detected in prior micro-filtering phases.

- Analysis of the data.

- Creation of a final data file.

Final results tables compiled using the final data file.

5.8 TABULATION AND DISSEMINATION OF RESULTS

The tabulation of results is presented, considering three classification variables:

- Main activity grouping, according to CNAE-2009 code.

- Size of the company, according to the number of employees.

- Autonomous Community

Moreover, results tables may be obtained that meet the information requirements of national and international institutions, as well as individual users interested in the subject; in all cases, statistical secrecy is maintained, with the limits delimited by the sample errors. This publication is available in the INEbase database, which may be accessed via the INE website (www.ine.es) annually.

5.9 SPECIFIC STUDY FOR COMPANIES WITH FEWER THAN 10 EMPLOYEES

Regarding the experience of the pilot study carried out in 2005, within the framework of the SICTEC, an independent sample has been researched of 10,389 companies with fewer than 10 employees, stratified according to size (number of employees), activity grouping (according to CNAE-2009 code) and Autonomous Community. Ver tablas 2 y 3.