ELECTRONIC GOVERNMENT

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Fernando Galindo
Francisco Javier García Marco
Pilar Lasala Calleja

Prensas Universitarias de Zaragoza

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Prensas Universitarias de Zaragoza. Edificio de Ciencias Geológicas, c/ Pedro Cerbuna, 12. 50009 Zaragoza, España. Tel.: 976 761 330. Fax: 976 761 063
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PROLOGUE

The key word here is Interdisciplinarity. What we mean is that any interested person would be expected to understand any study of the functioning of the Administration Services of the Executive Power as having the following twofold characteristic. The study must be undertaken considering the Administration as both an institution comprising individuals and the relationships between them, and as the norms that bring them to life: which regulate the field of action of the institutions, or the relations set up in Democracies between individuals and public institutions, the Administrations.

This is especially clear given that it is not unusual to hear people say today that in order to study the Administration it is necessary to study the Electronic Government. This means considering the Administration, in its range of geographical areas, as activity aided by Information and Communications Technologies (ICTs). This is the same as viewing the Administration in its current form, since it is well known none of the existing Administrations can be considered in isolation from ICTs.

That is why this book presents, in a summarized version, an introduction to the Administration, understood as Electronic Government, or supported by ICTs. It contains the following.

First it explains the objectives and characteristics of ICTs as employed at this moment in time by the public Administrations. Second, the facets, parts, visions or sections of the Administrations

using ICTs are presented. Third, an explanation is given as regards the verification of the workings of the electronic Administration as occurring in response to criteria and standards, which have gradually become consolidated as characteristics of Electronic Government in Democracies. Fourth, we present the main lines of regulations on electronic Administration that are beginning to be passed by Governments and Parliaments, in continuance of traditions, dating back to the second half of the twentieth century, established for the regulation of activities undertaken with the aid of ICTs.

The work is concluded with an Appendix and a Glossary. The Appendix is composed of an interdisciplinary measurement tool to ascertain the type of adjustment to standards occurring in specific cases of the activities of Administrations under study. The Glossary provides basic guidelines to understanding the contents of the work.

At the end of each chapter, after the corresponding recap, a few questions invite readers to make their own reflections on electronic government.

Saragossa, 1st of November 2009 The Authors

CHAPTER 1
INTRODUCTION TO ELECTRONIC GOVERNMENT

1.1 Basic Concepts in Electronic Relationships

It has become customary in English to adapt the terminology of a certain type of activities, when they are undertaken in an environment of new technologies employing electronic and Internet infrastructures, by adding the prefix 'e-'.

Consequently, commerce becomes *e-commerce*, learning becomes *e-learning*, and so on and so forth with *e-health*, *e-inclusion*, *e-culture*, *e-accessibility*, *e-government*, *e-Europe*, *e-business*, *e-signature*, *e-procurement*, *e-democracy*…

Also in the English-speaking world, *biz* is used as an abbreviation for *business*, giving rise to the generic term, *e-biz*, which can be defined in any of the following ways:

- The use of Computing and Telecommunications to channel flows of information and transactions between companies or organizations and their normal interlocutors (clients, citizens, suppliers, financial entities, transporters, organizations, etc.);

- Communicating electronically;
- Any activity involving companies and institutions that interact and make transactions with other organizations by electronic means;
- Any form of transaction in which the parties interact electronically.

The actors, relationships and products managed in an *e-biz* environment can therefore be very varied:

- Actors: companies, public administrations and individuals;
- Relationships: orders, dispatch management and electronic payment for goods and services, information requests, certification requests, payment of taxes…;
- Products managed: physical products, services (news, sound, image, databases, software…), certifications, permits…

More detailed examples of activities that can be undertaken in an *e-biz* environment are as follows:

- Advertising;
- Searches for product information;
- Exchange of physical or intangible goods;
- The different stages of transactions: *on-line* marketing, orders, payments, distribution support;
- Negotiation of conditions;
- After-sales services;
- Customer services;
- Completion of administrative data;
- Collaboration between companies;
- Payment of fees and taxes.

Depending on the actors involved in the *e-biz*, they may be defined as follows (see figure 1.1):

B2B (*Business to Business*): relationships between companies based on ICTs in order to undertake any type of business;

B2C (*Business to Consumer*): relationships between a company and its clients based on ICTs;

B2E (*Business to Employee*): relationships between a company and its employees based on ICTs;

B2G (*Business to Government*): relationships between companies and public administrations based on ICTs;

C2C (*Consumer to Consumer*): private relationships for the exchange of goods or services between consumers based on ICTs. The most widespread are those undertaken in auction sites, such as *ebay*;

G2B (*Government to Business*): relationships between public administrations and companies based on ICTs;

G2C (*Government to Citizen*): relationships between public administrations and citizens based on ICTs, the aim of which is to provide citizens with permanent on-line access to administrative information and services and to citizen participation channels;

G2E (*Government to Employee*): relationships between public administrations and public-sector employees based on ICTs;

G2G (*Government to Government*): relationships between public administrations based on ICTs to facilitate collaboration between different levels of government so central, regional and local administrations provide citizens with services as effectively as possible;

P2P (*Peer to Peer*): relationships between equals based on ICTs. The best known are those based on sites for the exchange of music and programme files such as *eMule*.

So how do the different types of *e-biz* relationships currently work? The answer is that electronic relationships are made using the communications infrastructure provided by Internet, and the different services available on Internet. Most electronic relationships are made exclusively using the World Wide Web. There are however other services such as email or file exchange.

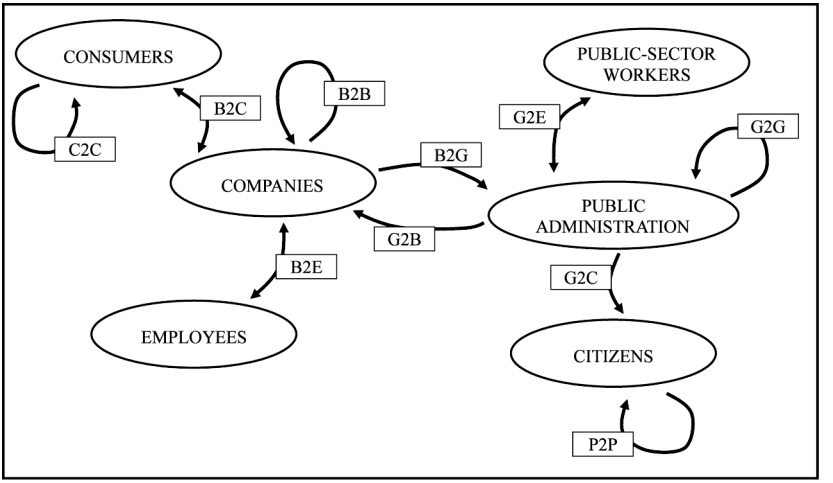

Figure 1.1. Types of *e-biz* by actors

1.2 History and Development of ICTs

1.2.1 Milestones in the History of Communications

Since the appearance of the printing press to speed up the production of copies of books more than five-hundred years ago, the development of communications has been unstoppable. And over the last twenty years, there has been a genuine revolution.

The following important dates can be cited in the history of communications (see figure 1.2):

1440 German, Johannes Gutenberg, invents the printing press, to enable the speedy reproduction of books, which up until that time were hand-written.

1837 American, Samuel Morse, patents the electric telegraph for long-distance instant transmission using electrical signals, an agreed coded text employing dots and dashes, Morse code.

1876 Scotsman, Alexander Graham Bell, having emigrated to the United States, patents the telephone for instant transmission of conversations using electrical signals (it seems the real inventor of the telephone was actually the Italian, Antonio Meucci, who had also emigrated to the United States).
1886 Italian, Guillermo Marconi, patents the radio for the first time, for instant long-distance transmission using electromagnetic waves, which gave rise to wireless telegraphy.
1907 The first transatlantic telegraphic communication made by radio.
1928 Radio receivers are marketed for collective radio listening.
1928 Scotsman, John Logie Baird, makes the first transatlantic television broadcast by sending images by means of radio signals.
1969 The first ARPANET network node is installed in the UCLA, the origin of Internet today.
1990 ARPANET ceases to exist and is replaced by Internet.
1991 Tim Berners Lee develops the World Wide Web.
1995 Internet is privatized, which enables its public use, in contrast to restricted access in force up until this point.

Figure 1.2 shows a timescale for all these events. The concentration of advances occurring more recently can be clearly discerned.

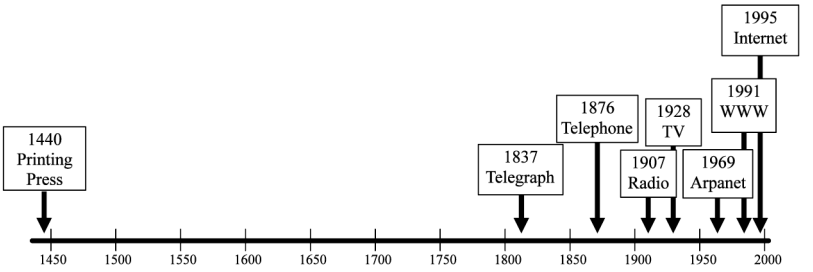

Figure 1.2. Milestones in the History of Communications

1.2.2 Communications Needs

In order to provide a historical overview to describe Internet and how it came into being, we should start by remembering how communications began to be established between computers[1].

Dr. Atanasoff, in conjunction with Clifford Berry, developed the first electronic digital computer between 1937 and 1942. He called his invention the Atanasoff-Berry Computer (ABC)[2].

In 1944 IBM built an automatic digital computer based on a project developed by Aiken[3] in 1937, and named it MARK I.

Mauchly and Eckert, following numerous conversations with Dr. Atanasoff, reading notes describing the beginnings of the ABC computer and seeing it in person, developed a machine for the calculation of tables for firing artillery for the US army after 30 months work against the clock. It was finished in 1946 and was called ENIAC[4] (Electronic Numerical Integrator And Computer). It weighed 30 tonnes and occupied a surface area of 450 square metres.

In 1945, John von Neumann, who had worked with Eckert and Mauchly at the University of Pennsylvania, published an article on the storage of programmes. The stored programme concept enabled the reading of a programme in the memory of the computer and the subsequent execution of its instructions without having to write them again. The first computer to employ this concept was the EDVAC (*Electronic Discrete-Variable Automatic Computer*), developed by Von

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1 There are many websites in which you can read up on this topic; for example <http://www.computerhistory.org>, <http://www.computerhope.com/history>, <http://en.wikipedia.org/wiki/History_of_computing_hardware> (consulted 14-07-09).

2 See <http://www.scl.ameslab.gov/ABC>, <http://en.wikipedia.org/wiki/Atanasoff_Berry_Computer> (consulted 14-07-09).

3 See <http://www-groups.dcs.st-andrews.ac.uk/~history/Mathematicians/Aiken.html>, <http://en.wikipedia.org/wiki/Howard_H._Aiken> (consulted 14-07-09).

4 In <http://ftp.arl.mil/ftp/historic-computers> and <http://en.wikipedia.org/wiki/ENIAC> photos can be viewed of this computer (consulted 14-07-09).

Neumann, Eckert and Mauchly[5]. The stored programmes provided computers with an incredible flexibility and reliability. They were made quicker and less subject to errors than mechanical programmes. A computer with a stored programme capacity could be used for several applications by loading and executing the appropriate programme.

All the above-mentioned computers were prototypes; just one was built in each case, for use in the laboratory in which it had been constructed. Eckert and Mauchly did however contribute to the development of computers by setting up a private company, UNIVAC, and building the first production line computer, the UNIVAC I[6], which the US Census Committee employed to evaluate the 1950 census, thereby breaking IBM's monopoly over data processing equipment based on perforated cards.

IBM reacted and began to build production line electronic computers. The first of its kind was the IBM 701[7] in 1953. In 1954 the IBM 650[8] model was introduced, the success of which is the reason why IBM today enjoys the importance it does in the computer market.

During the following years, the technology used for the construction of computers developed fast, evolving from valves through transistors and from these to integrated circuits. Computers got smaller, cheaper, faster and more capable of processing data. That is why computing technology was within reach of many companies and public bodies by the nineteen sixties.

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5 See <http://www.library.upenn.edu/exhibits/rbm/mauchly/jwm9.html>, <http://en.wikipedia.org/wiki/EDVAC> (consulted 14-07-09).

6 See <http://www.library.upenn.edu/exhibits/rbm/mauchly/jwm11.html> and <http://en.wikipedia.org/wiki/UNIVAC_I> (consulted 14-07-09).

7 See <http://www-03.ibm.com/ibm/history/exhibits/701/701_intro.html> and <http://en.wikipedia.org/wiki/IBM_701> (consulted 14-07-09).

8 See <http://www-03.ibm.com/ibm/history/exhibits/650/650_intro.html> and <http://en.wikipedia.org/wiki/IBM_650> (consulted 14-07-09).

They possessed computers capable of processing and storing large quantities of information. This led to the need for access, dissemination and sharing, or in other words, the communication of data over large distances quickly (figure 1.3). This fact resulted in the development of telematics.

Computer networks were first set up using existing telephone networks. The use of an analogical transmission medium to establish digital communication made it necessary to develop a mechanism to transform the digital signal produced by a computer into an analogical signal that could be transmitted along the telephone line. This mechanism had to be able to receive the analogical signal and transform it into digital before submitting it to the receiving computer. This was how the modem appeared on the scene (MOdulator-DEModulator) (figure 1.4).

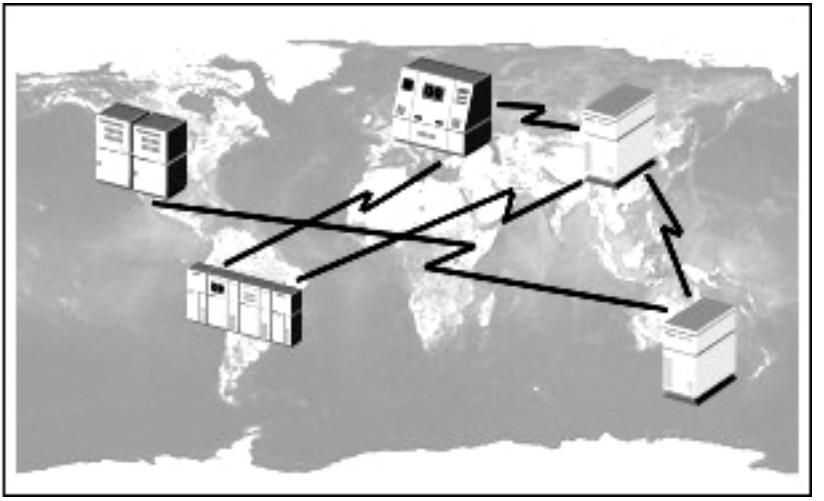

Figure 1.3. First computer networks

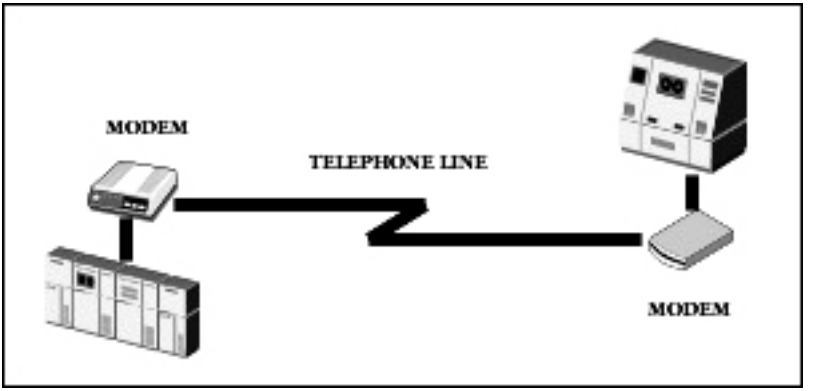

Figure 1.4. Computer communication by means of telephone lines

The development of micro-computing, in the nineteen eighties, led to there being a large number of computers close to one another in companies and official bodies, which soon needed to share information. This gave rise to the need for communication between computers over short distances, and as a consequence local networks were set up (figure 1.5).

The characteristic of proximity between machines in the same building enables the solution adopted for local networks to just involve the direct connection of the computer machinery to be integrated into the network using special cabling. To this end, the equipment must have a network card to manage the way in which each machine communicates with the others in the local network. The network card no longer has to transform the digital signal sent by a computer to the network, as in the case of the modem. The information circulates around the local network as a digital signal.

The next step was the integration of both solutions: LAN (Local Area Network) and WAN (Wide Area Network), so the different local networks could be connected together and conform a networks of networks.

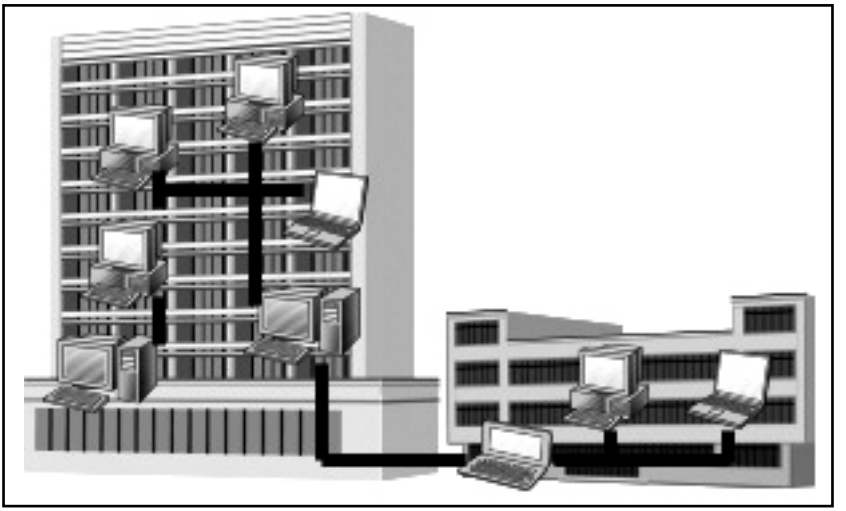

Figure 1.5. Local area networks

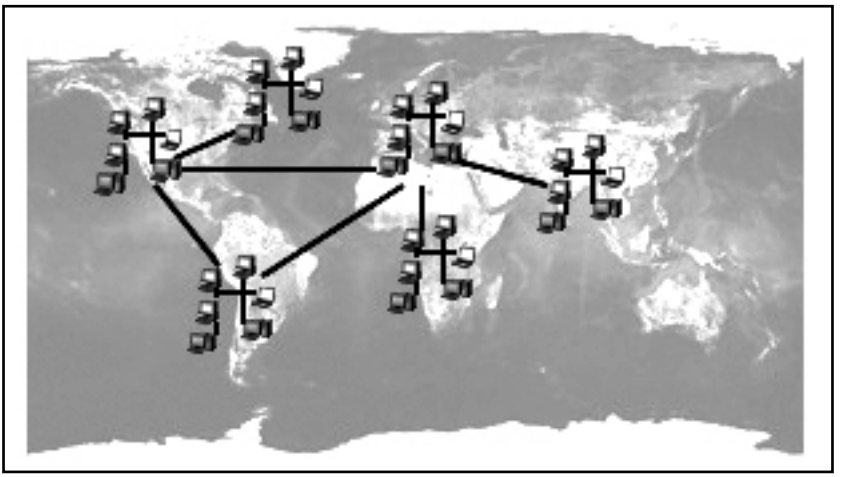

Figure 1.6. Wide area networks

1.2.3 Internet

The idea of a network of networks has now become a reality and is called Internet. It is the result of the interconnection of thousands of computers all over the world. They all use the same communication protocols; in other words, they all speak the same language so they can get into contact with one another.

Some people see internet as an educational and teaching tool, others as the cornerstone of democracy and freedom, others as a cultural experience, and many more as a means of doing business. The truth of the matter is however that Internet is just a collection of computers connected by high-speed telephone lines, which enables the possibility of instant communication between (nearly) every part of the world. The usefulness of Internet resides in the use that is made of this huge potential for communication.

The basic services now on offer on the Internet are electronic mail, network news, access to remote computers and data procurement systems, and the ability to transfer information between remote computers.

Internet began in the United States in 1969, as a purely military project. The Defence Advanced Research Projects Agency (DARPA) developed a computer network (ARPANET), to avoid the centralization of data, which enabled each network workstation to communicate with any other through a range of channels, and provided a solution for when technical faults occurred that could lead to the network not working.

The computers connected to a network were in military bases, universities and companies with Defence Department contracts. As the size of this experimental network grew, so did the security precautions. The same networks used by the companies and universities for military contracts were becoming increasingly accessible to the general public.

As a result, in 1984, ARPANET was split into two separate but interconnected networks. The military side was called MILNET. The

educational side received the technical name of ARPANET, but was referred to more and more as Internet.

In 1985, Internet was well established as a technology of great use to a large community of researchers and developers, and was beginning to be employed by other groups for daily communication between computers. Electronic mail (email) was becoming widespread and showing the usefulness of electronic communication between people.

In May 1995 the United States completed moving the control of the network to the private sector, and an organization was set up to lay down the official policies of the Internet, the Internet Society[9], which comprises the different groups responsible for Internet infrastructure standards.

In the beginning, Internet was a work tool for a research project related to defence. It has however turned out to be the most important means of communication in existence today affecting people in all the countries and cultures of the world.

Internet is exclusively the infrastructure that enables communication between computers by means of the TCP/IP protocol.

The rapid growth of Internet is to a large extent the result of the variety of services available and the ease with which they can be accessed, regardless of where the user is located. In order to gain access to any of them, you just require a terminal, the modem or connection card and the appropriate software. The latter is in most cases provided for free by the service provider.

A range of services are accessible on Internet, each of which has a different purpose but would not be possible without Internet. None of them is Internet itself. A distinction can be made between two types of services provided by Internet:

9 See <http://www.isoc.org/> (consulted 15-07-09).

- Basic services, providing general support for the other applications, or used for network management activities.
  - DNS, is a huge worldwide database that maintains the relation between domain names and corresponding IP addresses by providing a link between these.
  - DHCP, a protocol employed so a server can hold a range of IP addresses for the user posts, which are assigned dynamically and not fixed in time.
  - SNMP, the protocol used for the management of the network.
- End user applications: programmes conceived to be used by the end users, such as ftp, e-mail, news, etc.:
  - World Wide Web: is a standard for the presentation and viewing of multimedia pages using hypertext (documents containing links to other documents).
  - Electronic mail (e-mail): enabling personal communication between all network users. Each user is identified by their mail address: usuario@dominio, where the domain is the domain of the computer of the service provider connected.
  - Discussion groups: open or closed news groups on topics of a wide-ranging nature. They work as advertising boards on which any one can leave or read messages. The groups may or may not be moderated. If they are, the moderator decides which messages appear.
  - Chats or IRC (Internet Relay Chat): A service that enables the exchange of messages in writing in real time between users connected to the network simultaneously. It is a multi-user conversation system, in which people meet in channels (virtual place, normally with a topic of conversation) to talk as a group, or in private.
  - File transfer, also known as FTP (File Transfer Protocol): enabling the transfer of files of any type between computers connected via Internet.
  - Videoconferencing: communication of images and sound over the Internet. Communication is made between two communicators, each of which is connected to a server they provide with images and a voice, which are then sent to the server of the other communicator.

1.2.4 The World Wide Web

The World Wide Web (WWW or W3), is an idea built over the Internet. The physical connections of the Web are Internet, but a simple and consistent interface is introduced for access to the enormous resources available on the Internet.

The World Wide Web was invented in 1989 by Tim Berners-Lee, a computer scientist at the CERN[10] (European Organization for Nuclear Research). It was a hypertext system for the sharing of information based on Internet, originally set up to serve as a communication tool between the scientists of the CERN. His idea was based on three cornerstones:

- The manner in which documents are written: the HTML language (HyperText Mark-up Language).
- The way in which documents are moved around the Internet: the HTTP protocol (HyperText Transport Protocol), with the clarity and speed necessary for hypermedia, distributed and collaborative information system.
- The way in which documents available on the Web are located: URL (Uniform Resource Locator) is the specification of the protocol required to find a document or file, and the specification of the file itself. In general terms, it is as follows: *protocol*://*domain: port*/*pathname*/*specification of the file*
  Where:
  protocol may be http, ftp, telnet, gopher, etc.;
  server is the name of the computer in which the file is located. Also called the domain name;
  port is the port used to access the server; not included if it is the default one;
  pathname is the specification of the directory in which the file is located;
  file specification is the specification of the file being referred to.

10 See <http://info.cern.ch/> (consulted 15-07-09).

The Web contains documents in myriad formats, but they are all hypertext, which means a combination of data that contains links to other data. The data may be text, graphics (static or moving), audio or video. The links or hyperlinks, are links between the data of one Web page, with other data on the same page, another Web page, another file, another computer or another programme. In order to follow a link, the user has to click with the mouse on it. These documents are normally called Web pages.

In order for a user with an Internet connection to access Web pages, they need to have installed a viewer or browser, which is a programme capable of accessing and displaying Web pages and taking the user from one to another following the links. The most well known at this moment in time are Explorer and Firefox.

In order to search through Web pages available on the Web, use is made of search engines, which are at the same time Web pages on which the user enters key words related to the topic they are looking for so the search engine can display links to the Web pages on which the related information can be found. The most commonly used search engine at this moment in time is Google[11].

Hipertext is a combination of data containing links to other data. The data may be text, graphics (static or moving), audio or video. Hyperlinks are links from one datum on a Web page to another datum on the same page, another Web page, another file, another computer or another programme.

There is an organization that sets the official policies of the Web, the World Wide Web Consortium (W3C)[12], created in October 1994 by Tim Berners-Lee at MIT, in conjunction with the CERN. Its mission is to assure the Web fulfils its full potential by developing common protocols, which promote its progress and ensure its interoperability.

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11 <http://www.google.com/> (consulted 15-07-09).
12 See <http://www.w3.org/> (consulted 15-07-09).

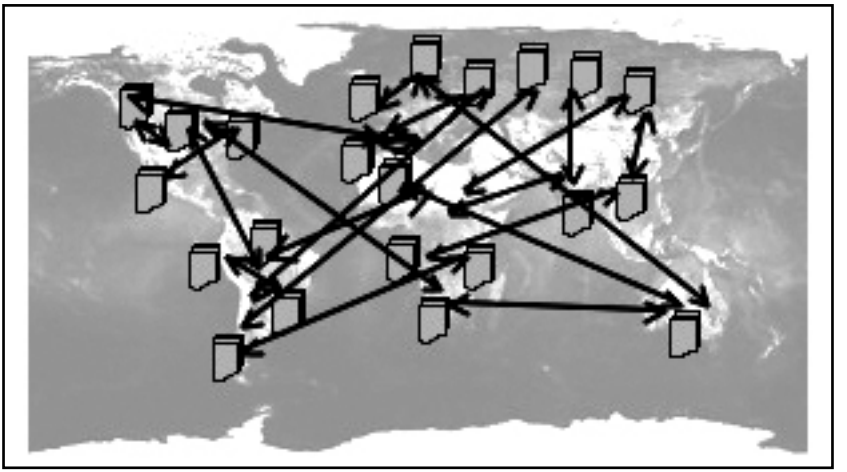

Figure 1.7. The World Wide Web

1.2.5 Globalization

Having resolved the problems involved in communication between people and between computers, it is now possible for two people or organizations separated by thousands of kilometres to instantly formalize the exchange of goods and services using the range of services provided by the Internet, with a dependence on transport to bring the exchange of goods into effect.

This has led to the globalization of today's society, in which commercial relations and cultural exchanges have increased between all the countries in the world.

1.3 Origins of Electronic Government

Electronic government is the use of ICTs to provide citizens and companies with easy access to the information and services of the Administrations of the state, to improve the quality of services by increasing the speed, integrity and effectiveness of the processes, etc.

and giving the citizens the opportunity of participating in a range of democratic processes.

The electronic government concept includes the internal use of ICTs within the Administration to improve the speed, integrity and effectiveness of processes (G2G), and the external use of ICTs to set up contacts between the Administration and citizens and organizations of the civil society (G2C), between the Administration and companies (G2B), between different Administrations (G2G) and between the Administration and its employees (G2E).

There are other concepts closely linked to electronic government, or e-government, but which have a different nuance.

One of these is e-Governance[13], which can be defined as the group of norms, processes and behaviours that have an influence on the exercise of power, especially from the point of view of openness, participation, responsibility, effectiveness and consistency.

Another is e-Democracy[14], which is the way in which the Administration employs ICTs to provide people with easy access to information and greater opportunities for participation in the institutions and democratic processes.

The origin of e-Government dates back to 1993, in the United States, the government of which promoted the 'National Information Infrastructure Initiative', in order to promote a fabric of communication networks, computers, databases and consumer electronics that placed an enormous quantity of information at the disposal of users, as well has helping cause an information revolution that changed the way of life, work and interaction of people and constructed a ICT resource platform in which industry, government and universities integrated their information systems.

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13 See <http://eur-lex.europa.eu/LexUriServ/site/en/com/2001/com2001_0428en01.pdf>, White Paper on European Governance (consulted 15-07-09).

14 See <http://www.e-democracy.org> (consulted 15-07-09).

At the end of the same year, Europe also confronted the new challenge and commissioned a report on the global Information Society in Europe to be presented in June 1994; the Bangemann Report 'Europe and the global information society. Recommendations to the European Council'[15]. Ten applications were proposed in the report for the launch of the information society. The ninth of them was the creation of a trans-European public administration network, with the initial aim of providing more efficient and cheaper information exchange (replacing paper with electronic media) to then be employed to unite public administrations and European citizens.

In the year 2000, the European Union launched the Action Plan *eEurope 2002-An Information Society for All*[16], which laid down a series of objectives for the year 2002 through ten actions; one of the actions was 'Online Public Administration'. When the *eEurope 2002* period concluded, the European Union launched a new plan, *eEurope 2005 – An Information Society for All*[17] with four policy measures. One of these was 'Modern online public services; online Administration'. When this plan was concluded, the European Union launched yet another replacement, *i2010 – A European Information Society for growth and employment*[18], with several objectives; one of these was 'An inclusive information society providing high quality public services and promoting quality of life'.

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15 See <http://www.epractice.eu/files/media/media_694.pdf> (consulted 15-07-09).

16 See <http://ec.europa.eu/information_society/eeurope/2002/index_en.htm> (consulted 17-07-09).

17 See <http://ec.europa.eu/information_society/eeurope/2005/index_en.htm> (consulted 17-07-09).

18 See <http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm > (consulted 17-07-09).

1.4 Advantages, Benefits and Risks of Electronic Government

The use of ICTs in the information processes of any type has major advantages that are clearly also obtained when used in procedures related to the public administration. Generally speaking some of these advantages are as follows:

- Possibility of speedy computer processing of large quantities of information.
- More effective management of information processing.
- Reduction in number of errors.
- Paper savings.

There are other specific advantages to the use of ICTs in the public administration:

- Time savings for the administration and the user.
- Possibility of interconnection between different bodies of the administration.

The use of ICTs by the public administration benefits all the parties involved:

- Better services for the citizens and companies as regards their relationship with the administrations.
- More effective and efficient public administrations.
- Higher quality public services.
- Impetus for the development of countries.
- Easy obtainment of information for citizens provided by the public authorities.
- Reduction in costs for companies and administrations.
- Easier transactions between administrations and those being administrated.
- A contribution to making the public sector more open and transparent.
- A contribution to making governments more understandable for the citizens.

Governments wish to ensure citizens, companies, the academic community and public institutions obtain simplified and quicker access to public services with a better relation between quality and price. That is why the public administrations of all countries are immersed in a transformation process to provide their citizens and companies with better services and to make operations more effective and better quality.

The objectives of this process of change can be divided into three types:

- Internal objectives:
  - Improving administrative procedures in terms of effectiveness and/or efficiency.
  - Integration and coordination of information systems and elimination of administrative islands that lead to information duplication and overlap.
  - Reorganization of internal processes in the interests of simplification and expeditiousness.
  - Promotion of the online exchange of information between Public Administrations.
  - Improvement to technological position, in the same way as private companies.
- External objectives:
  - Improvements to the exchange of information with citizens and companies.
  - Speeding up the processing of citizen affairs handled by the Administration to reduce waiting times.
  - Non-transfer of difficulties to citizens when they request services or meet an obligation.
  - Providing citizens with public access to electronic government services.
  - Increasing the satisfaction of citizens with the administration.
  - Promoting the development of electronic government services.
- Democratic objective:
  - Strengthening participation in politics.

The process of change initiated by the public administrations is not exempt from difficulties. The most significant of these is the coexistence of several public administrations in the same sphere. Specifically, in Spain's case, there are four levels of public administrations: the Local Administration, the Regional Administration, the General Administration of the State and the European Union Administration, a supranational decision-making body.

Other problems arise from the need for organizational changes, to adapt to new ways of working, training of personnel, who on many occasions lack experience and knowledge, and investment in infrastructures (servers, software, Website development, etc.).

And the process is not exempt from risk. During the implementation phase the following problems may arise:

- Lack of coordination, budget shortfalls, etc.
- Inadequate selection of potential users, exclusion of sectors of the population, etc.
- Participation of technical staff (experts in ICTs) but with no knowledge whatsoever of how the public administration works.

During the post-implementation phase, when an electronic government service is up and running, other problems may also arise:

- Errors, fraud, etc., because of a lack of suitable precautions as regards information security.
- Redundancy of channels used by the services.
- Lack of confidence of the users, because of a subjective sense of a lack of security.
- Usability problems.
- Lack of publicity, which results in an underused service.

1.5 Policies and Strategies for the Implantation of Electronic Government

The application of new technologies in public administrations has been present in the government policies of every country for a long time now, especially in the countries of the European Union.

The above-mentioned Bangemann Report drawn up for the European Union was already calling for a Trans-European Public Administrations Network in 1994, amongst other things, so citizens and economic operators could benefit from the Information Society.

As a result, in 1995 the European Union launched the first Interchange of Data between Administrations Programme-IDA to stimulate the creation of pan-European services for electronic government to maintain cross-border activities and to complement and include national, regional and local initiatives in the field of electronic government in order to achieve interoperable, informative and interactive electronic government systems across Europe, the aim of which is to benefit from the advantages of cooperation between public administrations in Europe and to have them reach citizens and companies alike. In 2003, the commission adopted a communiqué in which it pointed out the importance of electronic government as a means of achieving world quality public administrations in Europe[19].

On the 1st of January 2005, the European Union began to promote the IDABC[20] programme 'Interoperable Delivery of Pan-European e-Government Services to Public Administrations, Businesses and Citizens' as the continuation of the previous IDA and IDA II programmes. The intention of this programme is to take advantage of the possibilities offered by ICTs to increase cross-border services in the public sector for citizens and companies, to improve effectiveness and collaboration between European public administrations and to contribute to making Europe an attractive place to live, work and invest.

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19 The role of the electronic administration in the future of Europe. Communiqué of the commission to the Council, the European Parliament and the European Economic and Social Committee for the Regions. Brussels, 26-09-03, COM(2003) 567 final; <http://ec.europa.eu/information_society/eeurope/2005/doc/all_about/egov_communication_en.pdf> (consulted 17-07-09).

20 See <http://ec.europa.eu/idabc> (consulted 17-07-09).

The growing importance conferred by the European Union on the development of electronic administration is demonstrated by the fact that the *eEurope 2002 – An Information Society for All*, action plan included 'Online Public Administration' as one of its ten proposed actions. One of the four measures adopted from the eEurope 2002-An Information Society for All, action plan was 'Modern online public services, online Administration'. In September 2003, the commission adopted a communiqué in which it pointed out the importance of electronic government as a means of achieving world quality public administrations in Europe[21]; in which it states: 'Electronic government constitutes an essential element of the eEurope 2005 action plan. It is the sole area of eEurope in which governments not only have to ensure suitable conditions exist, but are exclusively responsible for its success'. Lastly, three objectives are laid down in the latest action plan *i2010 – An Information Society for Growth and Employment*, one of which is 'An Information Society that is inclusive, provides high-quality public services and promotes quality of life'.

The importance of the development of electronic government in Europe has given rise to the need for monitoring, for which the indicators proposed in the successive eEurope 2002 and 2005 initiatives are insufficient. The European Union created an eGovernment Observatory[22], a strategic initiative of the IDABC Programme, as a reference information tool for questions concerning electronic government and its development across the whole European Union. This observatory has subsequently been turned into a new portal on the Website of the European Union,

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21 See the role of electronic administration in the future of Europe. Communiqué of the commission to the Council, the European Parliament and the European Economic and Social Committee for the Regions. Brussels, 26.9.2003, COM(2003) 567 final; <http://ec.europa.eu/information_society/eeurope/2005/doc/all_about/egov_communication_en.pdf> (consulted 17-07-09).

22 See The IDABC eGovernment Observatory; <http://ec.europa.eu/idabc/en/chapter/140> (consulted 17-07-09).

eGovernment Practice[23], which 'provides eGovernment practitioners access to information and practice exchange on eGovernment throughout Europe'.

Spain, as a country in the European Union, also participates in the interest in the development of electronic government. A plan was presented in Spain in May 2003 to provide impetus to electronic government. The Secretariat of the Higher Council for Computing was created and in order to promote Electronic Government[24]. In this framework, the REINA report[25] was drawn up in 2003, a quantitative analysis of the ICT sector in the Public Administration, which included the most important economic contributions and the most representative characteristics of the IT resources, and at the same time made a comparison with other public and private sectors. Similar reports have been drawn up in successive years[26].

More recently the Ministry of Public Administrations presented the *Moderniza* Plan[27] 'which by means of a number of measures aims to improve and modernize the Administration in order for it to better serve the needs of the citizens'. This strategic plan was conceived to be developed over a period of three years, 2006-08, with a total of 16 measures, two of which are legislative initiatives, and three of which are action plans. The most significant result of this plan was the publication of Law 11/2007, of the 22nd of June for electronic citizen access to Public Services[28], which includes the following points:

- The right of citizens to not have to present documents containing data the administrations already possesses.

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23 <http://epractice.eu/index.php?page=home> (consulted 17-07-09).

24 See <http://www.csi.map.es> (consulted 17-07-09).

25 See <http://www.csae.map.es/csi/reina2003/REINA_2003.pdf> (consulted 17-07-09).

26 See <http://www.csae.map.es/csi/pg5r10.htm> (consulted 17-07-09).

27 See <http://www.map.es/documentacion/iniciativas/mejora_de_la_administracion_general_del_estado/moderniza.html> (consulted 17-07-09).

28 <http://www.boe.es/boe/dias/2007/06/23/pdfs/A27150-27166.pdf> (consulted 21-07-09).

- The obligation of the Administration to accept electronic documents presented by citizens.
- The administrative validity of electronic documents.
- The recognition of electronic signatures for communication with any administration digitally.
- The equal legal validity of electronic documents and traditional documents.

In the more general context of the Information Society, the Spanish Government presented the *Avanza* Plan[29] in 2005, superseded by the *Avanza2* Plan in 2009[30], through its Secretary of State for Telecommunications and the Information Society, part of the Ministry of Industry, Tourism and Trade. Both plans include a field of action referred to as 'Digital Public Services'.

As a result of these plans, Spain has pioneered certain aspects of electronic government in Europe, especially as regards electronic Identity Cards (DNIe)[31], the goal of which is for the Administration to obtain 'a reliable system for identification and guarantees of authenticity of actions carried out by citizens' and for the citizens to be able to 'interact with the Public Administrations telematically, without a need to be physically present in the installations to execute procedures, and to be able to execute these at any hour of the day or night'.

In order for citizens to be able to use the eDNI as a means of online identification before the Administration, there must be a mechanism to ensure the identification of the citizen. To this end, the validation platform called @firma[32] has been developed, to 'verify the state and

29 <http://www.planavanza.es/InformacionGeneral/PlanAvanza1> (consulted 21-07-09).

30 <http://www.planavanza.es/InformacionGeneral/Resumen+Ejecutivo2> (consulted 21-07-09).

31 See <http://www.dnielectronico.es> (consulted 17-07-09).

32 See <http://www.dnielectronico.es/seccion_aapp/plat_val.html> (consulted 17-07-09).

validity of electronic certificates employed by the citizen in any telematic procedure, including procedures concerning the DNIe'.

1.6 Summary

Communication has for centuries been a crucial question for society, for which technical solutions have always been sought out to facilitate the transmission of information between people. First by means of the printed word, then using the transmission of signals and finally with voice and images. When computers arrived on the scene half way through the twentieth century, the problem needing resolution became the transmission of information between them. The technical solutions available are modems, local networks and lastly, Internet.

The current omnipresence of Internet means it is a phenomenon that affects nearly all human activities, which has given rise to the prefix 'e-': e-commerce, e-learning, e-health, e-inclusion, e-culture, e-accessibility, e-government, e-Europe, e-business, e-signature, e-procurement, e-democracy…

The use of new technologies in the Public Administrations, also known as electronic government, for internal operations and for relations with citizens and companies, is a reality and a political objective of the vast majority of governments, especially those in the European Union.

European Union policies regarding the development of the Information Society in general and electronic government in particular, have been framed by the following successive initiatives: eEurope: eEurope 2002, eEurope 2005 and i2010.

In Spain, the interest of the government in the development of electronic government has been demonstrated by the *Moderniza* and *Avanza* plans, with a range of initiatives including the digital identity card and the law for electronic citizen access to Public Services.

1.7 Activities

Hold a debate on the following questions:

- Advantages and disadvantages of the development of human communications.
- Advantages and disadvantages of the development of computer communications.
- Advantages and disadvantages of Internet and globalization.
- Advantages and disadvantages of the development of electronic government.

CHAPTER 2
AREAS OF APPLICATION OF ELECTRONIC GOVERNMENT

2.1 Introduction

Electronic government is a wide-ranging phenomenon that is difficult to define, since both modern-day administrations and information and communication technologies are extraordinarily complex and highly developed domains. It is easy to become lost in the complexities and limit our understanding of electronic government to a few familiar cases we have personal experience of.

That is why one of the most important keys to understanding the phenomenon of electronic government is the development of a broad and systematic perspective of the realities of e-government.

This broad perspective is even more necessary for the development of effective electronic government programmes and projects. The vast majority of educated people recognize the prior need for a detailed 'mental map' of the domain of the realities we intend to have an impact on in order to develop any kind of efficient and effective action.

The objective of this chapter is to use the definition of electronic government to provide a breakdown of the range of aspects impacting on its development, paying special attention to the agents involved in the development of electronic government, the main areas of application, and the 'toolbox' available for its implementation, in other words, the theoretical models, methodologies and technologies.

Nevertheless, we should not lose sight of the fact that the maps describing the nature of electronic government vary depending on the perspective and the interests of the agents involved – people and organizations –, which participate in a number of different ways in its development and exploitation. A high-level administration official for example, approaches the problem of electronic government in his field as a planning issue, and requires a large map of his area of involvement, an inventory of methodologies and technologies, and a system of values and principles to endow the project with consistency and integration. A public-sector worker charged with the operation of an administrative process however, will assume the above-mentioned aspects to be signed and sealed, and will be concerned with the particular details of his tasks, normally represented by very specific concepts. In normal conditions business people or citizens will be concerned with the employment of the services of electronic government to fulfil their obligations with the administration and to exercise their rights in an efficient and effective way. Consequently, a broad and systematic perspective defining electronic government must integrate the range of different specific perspectives in an integrated manner, which is the goal of this chapter.

The general objective of the chapter can therefore be broken down into three parts – all three are interrelated –:

a) Provision of the most understandable and synthesized definition possible of the field of electronic government.
b) Presentation of a framework for understanding and classifying the wide-ranging world of electronic government.
c) Familiarisation with the main areas in which it is applied.

2.2 From the Definition of Electronic Government to its Classification

2.2.1 Definition of Electronic government

Electronic government can be defined by the range of different actions taken by the administrations to provide citizens with services and to govern, in general terms, the development of the information society. These actions include wide-ranging procedures, which, organized from the most abstract to the most specific, may be included within the following: conceptual and programmatic definitions; legislative and regulatory declarations – involving the necessary debate –; economic, social and political incentives; monitoring procedures; and more generally, any other effective approach to intervention. The objective of these actions is to improve the services citizens receive by means of the application of ICTs; to promote citizen access to public administrations; to facilitate, control and evaluate the development of the information society; and to devise a conceptual model of what is wanted and correct in the field of electronic government[33].

2.2.2 The Basic Dimensions of Electronic Government

Despite the fact that electronic government is a relatively recent phenomenon, many different criteria have been employed to classify the phenomena at play. One of the main ones was presented in the first chapter – the link between the agents of electronic government – by means of the following acronyms: B2G (Business to Government), G2B (Government to Business), G2C (Government

33 F.J. García Marco, F. Galindo, P. Lasala and A. Yubero, 'Towards an Ontology for Knowledge Organization in the Field of eGovernment', in: Kim Viborg Andersen, Åke Grönlund, Roland Traunmüller and Maria Wimmer (eds.), *Electronic Government – Workshop and Poster Proceedings of the Fourth International EGOV Conference 2005, August 22-26*, 2005, Copenhagen, Denmark; Linz, Austria: Universitätsverlag Rudolf Trauner, 2005, p. 158–65.

to Citizen), G2E (Government to Employee), G2G (Government to Government), etc. Another important classification refers to the analysis of the application of electronic government in the different levels of administration: local, regional, national, international … Classifications can also be made using the traditional functions of the executive power: Public Order, Inland Revenue, International Relations, Legal Administration, Social Security, Economy, Defence, etc. A geographical or chronological classification can of course also be made. The myriad points of view suggest the existence of a complicated panorama, which is, in a first instance, difficult to organize.

Fortunately, conceptual facet analysis invented by the Indian mathematician S. R. Ranganathan[34] (1967) helps us out in this task. Ranganathan proposes the classification of domains to be studied, which take the range of points of interest into consideration and organizes them into a universal outline based on the grammar of the statement. As a result he sets up five universal categories – facets in his terminology –: personality, energy, matter, space and time. Another sixth facet should be added to these facets, which are in turn broken down further, referring to the discipline, paradigm or focus of study, which we call perspective[35].

It is possible to detect the facets specified in table 2.1 by applying this methodology to the field of electronic government.

The range of points of view from which the world of electronic government can be analyzed and classified can be summed up in a single phrase: 'A specific governmental agency – a specific 'administration' – acts in favour of a specific group or class of citizens using the means of intervention at their disposal in a

34 Shiyali Ramamrita Ranganathan, *Prolegomena to library classification*, Madras: Asia Publishing House, 1967.

35 Francisco Javier García Marco, *The sixth facet?: Towards the reconciliation of facet and disciplinary classification in a multi-disciplinary world*. In press.

specific field of social interaction to improve the development of certain aspects of the information society within particular spatial and temporal limits'. From a viewpoint centred on citizens – assumed to exist in democratic societies – the end of the phrase should really be 'to improve a specific field of social interaction by promoting the information society within particular spatial and temporal limits'. Furthermore, if we wish to analyze research work, the phrase would begin as: 'The research work tackles the study of the work undertaken in certain disciplines, in the framework of particular paradigms and using certain methodologies…'. Figure 2.1 provides a graphical representation of the general model of analysis and figure 2.2 shows the different dimensions as a tree diagram.

Generic facets	Facets in the field of e-Government
Personality	Government Agencies End citizens (organized or not) Participating citizens (organized or not) Third parties
Matter	Fields of intervention: health, security, defence, taxation, justice, etc. Levels of jurisdictional intervention Intervention environments
Energy	Intervention methods: subsidies, regulations, control, etc.
Space	Geographical area
Time	Evolution over time
Perspective	Discipline, paradigm, focus, methodology

Table 2.1. Facets of the analysis of electronic government

Once a general outline of the analysis and methodology employed has been defined, a detailed study is undertaken of the more complex facets, specifically, the agents, levels, areas and environments, and the intervention procedures, methods and tools.

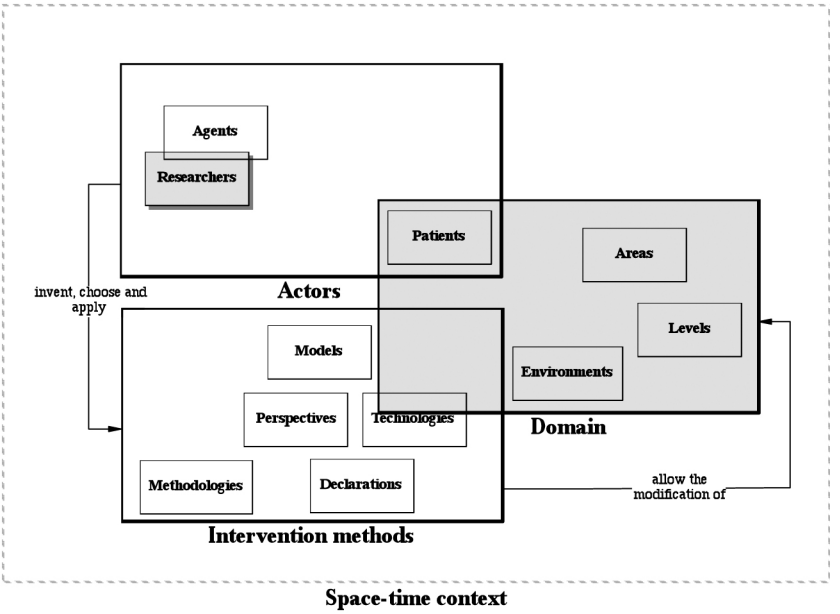

Figure 2.1. Dimensions of the analysis of electronic government: general aspects

2.3 The Agents and their Relationships

The agents involved in the development of electronic government are the same as those involved in public activities in general:

a. Administrations, organized hierarchically and with particular areas of competencies and jurisdiction.
b. Individual citizens, subject to rights and obligations, or organized into non-institutionalized interest groups, which may develop some kind of political activity.
c. Non-government organizations (NGOs) of different types, such as parties, unions, associations, development associations, foundations, etc.
d. Companies.

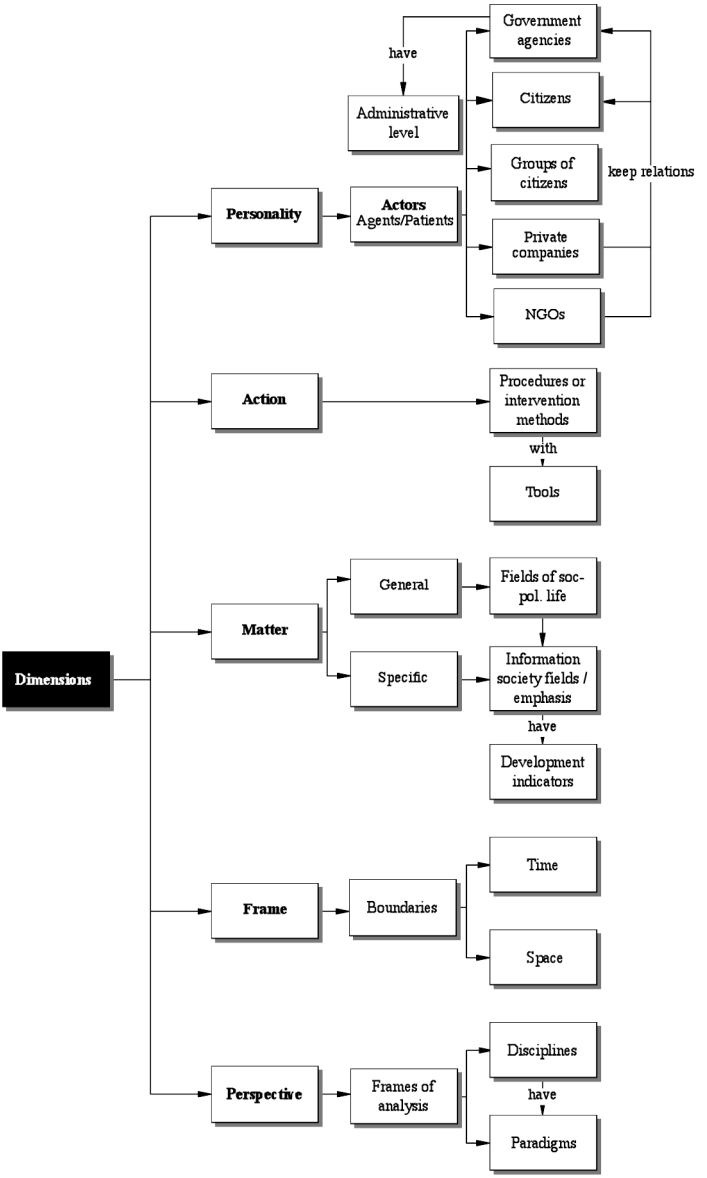

Figure 2.2. Dimensions of analysis of electronic government: details

Most researchers group some of these categories in practice. For example, NGOs are usually considered companies in electronic commerce and citizens in electronic government.

Moreover, the different agents sometimes act as promoters and sometimes as beneficiaries. A citizen may therefore act by electronic means to meet a duty – for example, the payment of taxes –, to exercise a right – sitting exams for public sector employment – or to foster action for the development of electronic government – signing a manifesto in favour of equal access to the network for all.

The groups of agents under study maintain complex interactions between themselves, which are usually studied through typified or closely related couples, in the same was as occurs in electronic commerce (see figure 1.1 in chapter 1). Table 2.2 shows these interactions as a matrix with the initials of the names in English of the different types of actors (*G*overnment, *C*itizen, *B*usiness, *N*on-Governmental Organizations). The inclusion of the NGOs is unusual. Only the items specified in bold are in effect specific to electronic government. It is possible the others are too, if they have a political outlook.

	Government	*Citizens*	*Businesses*	*NGOs*
Government	G2G	G2C	G2B	N2O
Citizens	C2G	*C2C*	C2B	N2O
Companies	B2G	B2C	B2B	N2O
NGOs	N2G	N2C	N2B	N2N

Table 2.2. Relations between the agents: couplings

It is a table similar to those established in the world of electronic commerce, but here citizens are considered to be political entities, not consumers, despite the fact that both have the same initials (C).

2.4 Levels, Areas and Environments

The second dimension of the study of electronic government is related to the *domains of intervention*, i.e. the aspect of social or natural reality to be modified in the interests of the actors. The domain the actions of electronic government is to be developed on can be classified from at least four points of view: the jurisdictional area, the traditional areas of government, the areas of specific interest of electronic government – often transversal –, and the social environments.

The *jurisdictional area* is structured in levels, which in general terms, correspond to international, national, regional and local, with the possibility of a range of sub-levels within these.

The *traditional areas of government* are generally well established, but are articulated in different ways in different political environments and also change over time. The most important concern international relations; taxation and the inland revenue; the legislative and regulatory domain; the legal world; infrastructures and public services; economic promotion and regulation; education and culture; public health and social protection; security and public order.

Despite the fact that all these areas are susceptible to the actions of the electronic government, there are some aspects that are *especially interesting in the field of electronic government*, and which are often of a transversal and multi-disciplinary nature. These are topics such as IT and communications products and services, electronic commerce, cyber-crime, etc.

Another important level of analysis of the domain of intervention refers to, lastly, the specific environments in which the social activity is carried out: consumption areas, the home, schools, hospitals and health centres, prisons, working areas, etc. Although some spaces can be univocally assigned to a specific area of government or even electronic government, many of them are of a transversal nature.

2.5 Intervention Procedures, Methods and Tools

The third dimension of the study of electronic government concerns the methods employed by the agents to intervene in a specific aspect of social and political-administrative reality.

The techniques or intervention methods can be classified into four main groups: firstly those aimed at the definition of the frameworks for action; secondly, promotion actions, which aim to voluntarily incentivize electronic activities in the public sphere developed by the range of interested parties; and lastly, the monitoring activities, the objectives of which are twofold, firstly to ascertain the real development of the information society in general and the development of electronic government in particular, and secondly, to ensure the activities undertaken in these fields adjust to the legislation and regulations.

The first group can be generically described as *definition procedures.* It includes reflections, discussion and the formulation of principles, policies, regulations and institutions on political and philosophical levels. The definition of principles includes red-hot issues concerning universal principles such as liberty, equality – with problems such as access rights and the digital divide – and security – including problems such as integrity, authenticity, privacy, data protection, transaction security and intellectual property. Ethical, ontological, epistemological and logical analyses alongside political programming and action, are the main techniques applied to this level. The philosophical definition is specified in a political definition, accepted by the organized interest groups according to established procedures, and this definition is specified in legislative definitions, and subsequently in legal resolutions described in the legislation and jurisprudence. The areas not covered by the legislation and the jurisprudence are subject to regulatory action taken by civil society – non-government organizations, companies, citizens – through codes of practice, recommendations and standards, often under the auspices of the public powers.

Lastly, the work defining the public and private space reaches its highest level in the design of the institutions that are active in the domain of electronic government, which may be public bodies, companies or NGOs.

The activities or procedures for *promotion* are those carried out by the administrations to direct the activities of the agents involved in the development of the information society by means of incentives, without coercion. The most important are, first the promotion of basic and applied research, innovation, and the transfer and dissemination of science-techniques through public and semi-public bodies, and through tax incentives and subsidies for citizens, companies and non-governmental organizations. Secondly, the area of training, education, consultancy, assistance and information on the development, installation and use of new information and communications technologies is especially important.

Lastly, the monitoring procedures must constitute a process receiving feedback in which, firstly, the aim is to ensure the ethical, legal and regulatory definitions of electronic government are met, and secondly, data is collected on the reality of the society and electronic government to check whether policies are adjusted to reality and are effective and efficient. Part of this monitoring process involves the work of legal and arbitration tribunals, certification bodies, monitoring agencies and the police – in response to processes of the first type – and evaluation and auditing processes – in response to those of the second type.

The evaluation procedures are especially important for the development of electronic government. They ensure other actions are conceived developed and corrected sensibly and in accordance with the reality, scientifically if you will, and in short, with quality[36]. The next chapter develops a model for the evaluation of electronic government services.

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36 Julian Teicher, Owen Hughes and Nina Dow, 'E-Government: A New Route to Public Sector Quality', *Managing Service Quality*, 12-06-02, p. 384–93.

2.6 The Action Outline: Basic File

Table 2.3 shows a simplified model of the analysis of products, services and studies of electronic government based on the model that has been developed on previous pages. This model serves to categorize and provide the basic data in order to understand a particular website, a tool for participation or research into electronic government. The second part of the table is completed during studies.

Services and products	Governmental agency	
	Target group	
	Area of intervention	
	Aspect to be improved	
	Intervention method	
	Tools	
	Geographical framework	
	Time framework	
Studies	Agent/agency	
	Discipline	
	Paradigm	
	Theory or model	
	Methodology	
	Geographical framework	
	Time framework	

Table 2.3. Basic file for the categorization of products, services and studies of electronic government

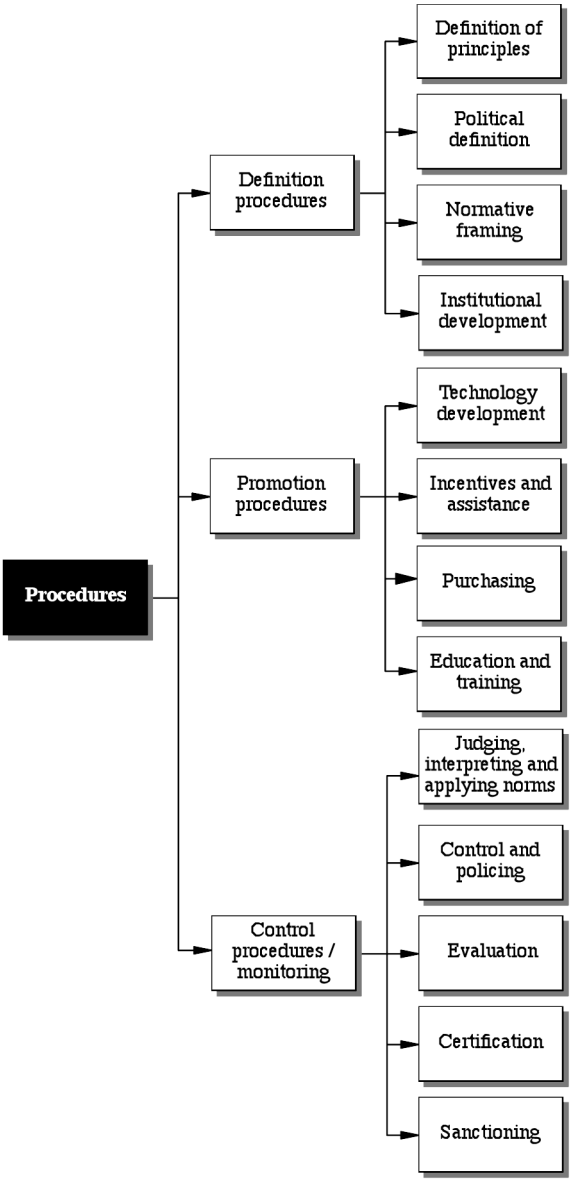

Figure 2.3. Intervention procedures for the development of Electronic Government

2.7 Summary

An attempt has been made in this chapter to present an overview of the different areas in which electronic government is developed, in order to provide a framework for the analysis of products, services and studies on electronic government. A definition of electronic government is provided and the most common terminological problems concerning this concept are analyzed. An analysis is also made of the elements involved in any electronic government activity, and secondly in any study of the topic. And an operational model is proposed with an analysis file to broadly and effectively categorize and describe any electronic government service.

2.8 Activities

1. Complete a brief survey of ten people in your family or neighbourhood on which electronic government services they use and how often.
2. Select five services from the above-mentioned list and analyze them in accordance with the 'Services and Products' part of the basic file in table 2.3.
3. Make a search in the database of the Scientific Information and Documentation Centre (CINDOC) of the Higher Council for Scientific Research (CSIC) for twenty articles on electronic government services.
4. Select five articles on similar topics and analyze them using the complete basic file in table 2.3.

CHAPTER 3
ANALYSIS AND EVALUATION OF ELECTRONIC GOVERNMENT

3.1 Introduction

The third chapter will develop a model for the analysis and evaluation of electronic government, the complete detailed questionnaire of which is provided in an appendix at the end of the book.

The model has three specific objectives: first to provide real data that enables the ascertainment of the state of the development of electronic government in a specific area or for a specific service; second, to enable the comparison of different services using these data, to be able to use these to set up a ranking and facilitate the objective placement of the service in accordance with best practices in the sector and domain, and third and last, to serve as a framework for carrying out detailed audits of the electronic information services as regards the setting up of a strategic plan employing the analysis of weaknesses, strengths, threats and opportunities of the service under analysis.

Consequently, the model can be used to evaluate the electronic government of a particular jurisdiction and to carry out detailed analyses of specific services.

The information provided in this chapter is organized into three parts. First, the conceptual and methodological bases of the analysis model are established. To this end, some basic concepts are analyzed – quality, analysis, evaluation, quality management and quality evaluation – and particular existing models for the evaluation of quality are studied, of a general nature and those specifically applied to the evaluation of websites. Second, the basic characteristics of the analysis model are presented and its objectives are explained. Third, an explanation is given of how the analysis is carried out, the first part of which aims to document and evaluate the socio-economic and political-legal framework of the service/s analyzed, and the second part of which explains specific aspects of the quality management of the site and its technical design.

3.2 Bases for an Analysis Model and Evaluation

3.2.1 Basic Concepts: Quality, Analysis and Evaluation

The Dictionary of the Spanish Language (Spanish Royal Academy, 2001)[37] describes the long history of the term *quality*. It comes from the Latin *qualĭtas, -tis* and in turn corresponds to the Greek ποιότης. It has a range of meanings, the first four of which, of a general nature, are of interest to this chapter:

1. f. Property or combination of properties inherent in something, that enable its value to be judged.
2. f. Good quality, superiority or excellence.
3. f. Nature, sort, type.
4. f. Condition or requirement included in a contract.

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37 Spanish Royal Academy (Madrid). *Dictionary of the Spanish Language*, 22nd ed., Madrid: Espasa Calpe, 2001, 2 v.

And *evaluation* is defined (Spanish Royal Academy, 2001) as 'Estimate, appreciate, calculate the value of something', and *value* is used in two main senses. The first similar to comparison: 'equivalence of one thing with another'. The second is related to the relevance of the something to meeting a specific need: 'Degree of usefulness or suitability of things to meeting the needs or providing wellbeing or delight'. This last idea is very important because the evaluation is always carried out not only in relation to a model, but also to the underlying needs of a particular audience the product or service aims to respond to.

Lastly *analysis* – from the Greek ἀνάλυσις – is defined as the 'distinction and separation of the parts of a whole in order to ascertain its beginnings or elements' (Spanish Royal Academy, 2001). Analysis and comparison are closely linked operations. One can not be executed without the other.

In conclusion, the concept of *quality* refers to the consubstantial properties or characteristics of something – i.e. that distinguish it and make it distinctive. It is also a concept that allows for comparisons, since it serves to establish the degree to which a specific example of a general category meets the specific requirements that mean it can be included as a member in the category. Therefore, standard ISO 9000:2000 – one of the main points of reference for establishing the meaning of quality in the area of products and services – defines quality as the 'degree to which a combination of inherent characteristics meet with the requirements'[38] and represents the relationship between the key concepts concerning quality in a similar way to figure 3.1. Judging the quality of something therefore involves comparing it with the best example of its category, whether it exists in reality or is the fruit of a design or reflection process that is yet to be put into practice.

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38 Spanish Association for Standardization and Certification. *UNE-EN ISO 9000: quality management systems: foundations and vocabulary: (ISO 9000:2000)*, Madrid: AENOR, 2000.

The first phase of the evaluation involves designing or detecting the ideal model and describing the properties, attributes or characteristics that have made it so, following a thorough process of analysis. The different specific cases detected in reality can then be compared with the model to establish the extent to which they coincide with it and to compare the degree of satisfaction obtained by the target audience. Some of the examples being analyzed on occasions exceed the model in particular characteristics or add some new distinctive property, which means the model must be updated.

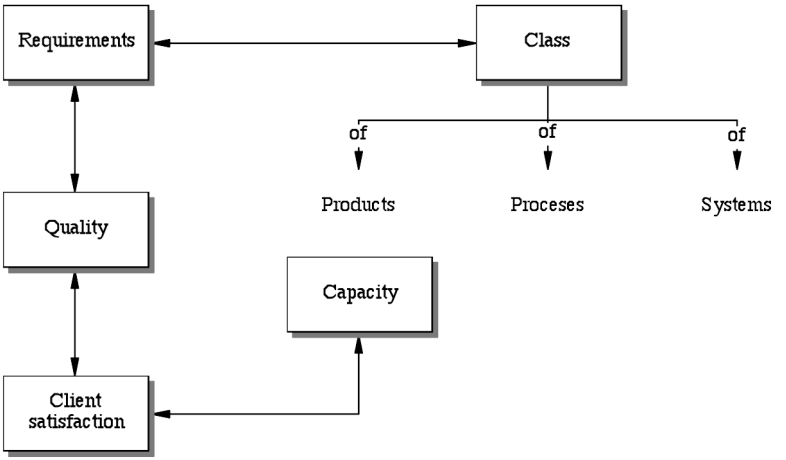

Figure 3.1. Key concepts for defining quality in standard ISO 9000:2000

The evaluation of a specific service or product therefore involves the definition of a group of specific characteristics, normally by means of the collection of the existing properties in the range of proposals on offer on the market or in the field of comparison, and especially of those that mark a clear difference. This methodology is known *benchmarking* in the field of business, and is incredibly useful. Nevertheless, the methodology evaluates the quality of the product or service by referencing those in the same category, but does not

provide information on the resources employed, or the production or use context. A complete analysis would also have to include these aspects.

3.2.2 Quality Management and Evaluation

There are in effect methodologies for the evaluation of quality that go further than just comparing characteristics, and tackle all the aspects contributing to the quality of a product or service. One of the most important was proposed by the *European Foundation for Quality Management*[39], whose model is presented in figure 3.2.

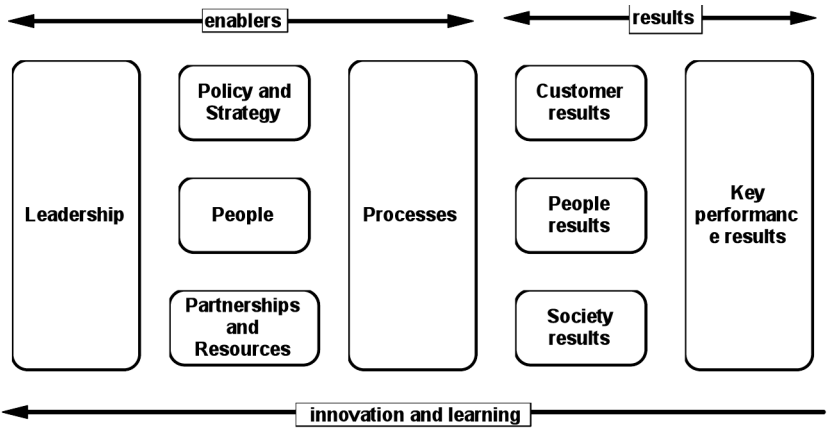

Figure 3.2. The EFQM model (© EFQM)

The EFQM model divides the factors that must be taken into account when evaluating quality into two large groups: the conditioners or enablers – leadership, policies and strategies, people, alliances and economic and material resources – and the results

39 <http://www.efqm.org/> (consulted on 08-01-07).

achieved – in clients or users, in the people in the organization supplying the service or product, and in society as a whole. It also marks the three mainstays of quality: the leadership or commitment to quality of the whole organization and especially its top executives, the processes designed to achieve it, and the reference to a group of key results, that can be measured.

Another important reference for the evaluation of technological services in general is the Oslo Manual[40]. This international standard is especially useful for the evaluation of electronic government because of the suggestions and recommendations it proposes for the measurement of processes for innovation, the accounting of innovation expenses and for the design and execution of operational research procedures.

Lastly, there are a range of tools for the evaluation of web pages and websites that employ a range of approaches, such as those used by publishers and librarians to evaluate documents, and those used by technologists to evaluate how easily products and services can be used, as applied to the area of the WWW by Nielsen[41] and his followers. For example, in Pinto et al.[42] you can consult a specific website analysis model – in this case for Universities – and some of the most important references on the topic.

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40 Organisation for Economic Co-operation and Development (OECD): *Oslo manual: The measurement of scientific and technological activities: proposed guidelines for collecting and interpreting technological innovation data*, Paris: OECD, European Commission, Eurostat, 1997.

41 Jakob Nielsen, *Designing Web Usability: The Practice of Simplicity*, Thousand Oaks: New Riders, 1999.

42 M. Pinto Molina, J.L. Alonso Berrocal, J.A. Cordón García, V. Fernández Marcial, C. García Figuerola, F.J. García Marco, C. Gómez Camarero, Á.F. Zazo y A.-V. Doucet, 'Qualitative analysis of the visibility of the research of Spanish universities through their web pages', *Spanish Magazine of Scientific Documentation*, 27, 3 (2004), p. 245–70.

3.3 The Analysis Model

3.3.1 Description of the model

Figure 3.3 on the next page presents the analysis model employed to draw up the questionnaires, details of which can be found in an appendix to this book.

The model serves to analyze a specific electronic government service or the workings of electronic government in a particular area as a systemic process in which there is a context, some inputs, some transformation processes, some outputs, and some outcomes for the whole system or some parts of the system. The dynamics of the model can be described as follows: by employing certain resources such as leadership, experts, budgets, contacts, etc. – inputs –, development of electronic government products is achieved through particular procedures to facilitate the provision of services by the Administrations or the fulfilment of obligations by the citizens – outputs. These products have an impact on the users, the public sector workers and society as a whole, ideally in terms of greater satisfaction, greater efficiency in the use of resources, etc. – outcomes.

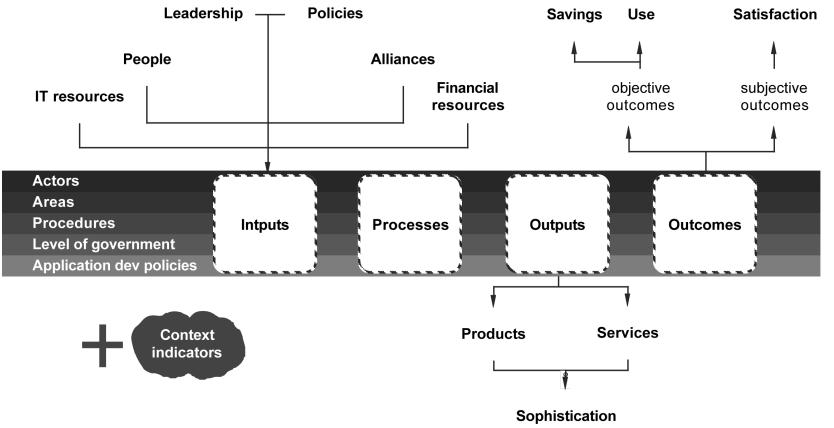

Figure 3.3. Analysis model for electronic government

The horizontal bands covering the entire process from the inputs to the outcomes refer to the options employed as regards the approach of the planned service or the analysis carried out. The electronic government service or product or the area of analysis selected can therefore be classified in accordance with a range of possible concurrent criteria, which were studied in the previous chapter: the actors taking part, the areas of intervention, the technical procedures and methodologies, the jurisdictional level and the development policies.

3.3.2 Indicators

The model comes down to a group of 93 indicators that describe the context, inputs or resource investments, outputs or products, and outcomes for the users. Each of these sections is a part of the analysis tool and each part can be subdivided, if appropriate, into areas. The input indicators are therefore divided into six areas – leadership, policies, alliances, human resources, economic resources and development policies – and the output indicators are divided into number of services, level of services in critical processes, integration, navigability, searchability (internal), searchability (external), accessibility with special needs, up-to-dateness, responsibility, linguistic accessibility, interoperability, size, use of multimedia resources, availability, feedback, and quality policies. In sum, the outcome indicators at this time focus solely on the users and describe the use of services and the satisfaction of the users with the services.

There are three types of indicator from the point of view of their quantification:

1) Indicators of presence and absence – for example, the existence or not of the legal regulation or administrative organizations specialized in electronic government. The indicator shows a 1 if it is true and a 0 if it is not.
2) Objectively measurable indicators – for example, expenses, number of connections, volume of transferred or stored bytes. The indicator shows the corresponding quantity.

3) Subjective factors, which however, can be estimated using verbalized opinions – such as user satisfaction. The indicator is a number on a scale from maximum satisfaction to none whatsoever.

The questionnaires very often request complementary information and documentation to enable the execution of analyses that contain more than just quantitative data.

3.3.3 Questionnaires

In order to facilitate the compilation of data, the indicators have been divided into four different questionnaires according to the sources that have to be used to locate the necessary information (see appendix). In order to avoid having to traipse from one source to another and to save the evaluator time.

Firstly, the Phase 0 questionnaire guides the researcher through the compilation of context statistical data from the National Institute of Statistics or equivalent organization.

Secondly, the Phase I questionnaire requires searches for particular data in legal databases, bibliographical catalogues, search engines and other documentary sources.

Thirdly, the Phase II questionnaire guides you through the analysis of the website under study. This is completed by means of the exhaustive use of the website.

Fourthly and last, the Phase III questionnaire is completed by means of interviews with the people responsible for the website under study or other authorized personnel or experts.

3.4 Documenting the Environment and the Socio-Political and Legal Frameworks

As mentioned above, the understanding, analysis and evaluation of an electronic government service must begin with the adequate understanding of the context in which it is developed and which it

serves. The analysis model proposed in this book takes into account the analysis of the socio-economic context as well as the detailed exploration of the political and legal framework in which the service is provided and becomes meaningful.

3.4.1 The Socio-Economic Environment

In order to become familiar with the socio-economic environment, the best option is to turn to the official statistics of the country, or to those provided by large companies, associations and foundations interested in the topic of the research. In the case of Spain for example, the key point of reference is therefore the National Statistics Institute[43], which in its section on Science and Technology, provides two basic statistical references: *The survey on the use of ICTs and electronic commerce in companies*[44] and *The survey on information technologies in homes*[45]. You can click on the results for last year on theses – or those you desire, if you are carrying out a retrospective analysis – and then on each of the tables you want to consult – nationally or regionally – and each time the corresponding inquiry screen is completed (figure 3.4).

3.4.2 The Socio-Political and Legislative Environment

A number of measures can be taken in the analysis of the socio-political and legislative environment. It is at least necessary to inquire into the degree of public discussion on the range of aspects of electronic government in the news media; the legislative, executive and legal processes underway concerning electronic government, and the presence of the topic in non-governmental collaborative and regulatory processes.

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43 <http://www.ine.es> (consulted 08-01-07).

44 <http://www.ine.es/inebase/cgi/um?M=%2Ft09%2Fe02&O=inebase&N=&L=> (consulted 08-01-07).

45 <http://www.ine.es/inebase/cgi/um?M=%2Ft25%2Fp450&O=inebase&N=&L=> (consulted 08-01-07).

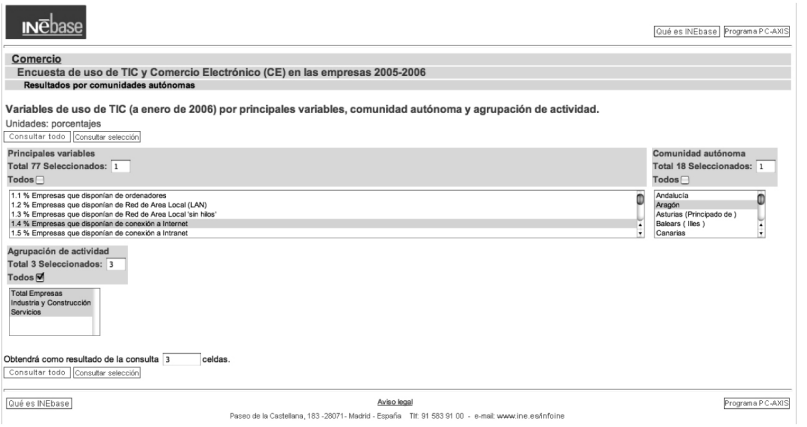

Figure 3.4. Example of a search screen from the National Statistics Institute

In the LEFIS Metric, Galindo, García and Lasala[46] propose the study of at least five aspects: legislation and regulations specific to electronic government, references to aspects related to electronic government in other laws and regulations, legal sentences related to the development of electronic government, and interventions occurring in parliaments and professional organizations concerning the topic under study.

The legislation, regulations and jurisprudence can be searched for in specialized databases such as Westlaw.es of Thompson & Aranzadi – freely accessible in many universities – both the field of the title (for documents referring especially to electronic government) and complete texts (for references contained in laws, regulations and sentences). (It is logical to begin with the title field to locate the most far-reaching regulations.) Terms such as electronic, digital, telecommunications and internet will serve to retrieve the majority of the more general documents. Compound terms – such as 'electronic

46 F. Galindo, J. García Marco and P. Lasala, «EGOBS: an International Electronic Government Observatory, Initial Results», in: K.V. Andersen et al. (eds.), *Electronic Government. Proceedings of the Fifth International EGOV Conference, 4–8 September 2006, Poland*, Linz: Universitätsverlag Rudolf Trauner, p. 317–24.

government' – are normally searched for in inverted commas to prevent the appearance of any record containing both of the parts even though they are in different parts of the text. Their search in combination with the union operator (OR, etc.) will provide larger searches and will retrieve, with greater background noise, other documents of interest. If the system allows it, it is useful to employ wild cards and short versions with the terms that have morphological variations. For example, electron* will usually enable the retrieval of electronic and electronics. In Westlaw.es, the asterisk (*) is used to replace several characters and the question mark (?) for isolated characters. The union operator for search groups in the database (OR, O, +, etc., .O in Westlaw) is employed to search for several terms at the same time to increase the results. For example, the intersection operator (AND, Y, &, etc., .Y en Westlaw) serves to combine several terms by specifying or restricting the search; and the exclusion operator (NOT, NO, -, etc., .NO in Westlaw) enables the exclusion of all the records that contain said term. So for example, the inquiry (electr* .O digital* .O telemat*) .And (administration .O government) enables the retrieval in Westlaw.es of any combination of the terms in the first brackets with those of the second. (More terms or short versions could be required, but Westlaw.es has limits on the number accepted, which means they can only be exceeded by making new searches with the remaining terms).

Whatever the case may be, the help of the database being used must always be consulted in order to become familiar with the specific nature of the operators you want to use.

3.5 Analysis and Evaluation of Portals and Services

3.5.1 Introduction

The second part of the analysis, specifically related to the completion of the questionnaire of Phase II, consists in the detailed study of the website supporting the activities of information, inquiry or execution

of interactions between the administration and citizens, companies and NGOs. The website is the product, the specific result of an activity of research, development, innovation or adoption of technology in the area of electronic government. Maximum interest must be paid to this. The indicators under study have been grouped into six major areas of interest: the resources employed; the degree of implementation of the services; the ease of locating the site, navigating on it and searching for information; availability and accessibility of the service; how up-to-date the information is; and lastly the responsibility for and policies concerning quality and interaction with site users.

3.5.2 Resources Employed

This block concerns the evaluation of the resources that have been mobilized and used in the electronic government service under study. They have been grouped into five categories.

The first aspect to be considered is whether the action has been developed within a *strategic plan*, in other words, within a medium to long term plan that is backed by an analysis of the weaknesses and strengths of the institution carrying out the project and the threats and opportunities posed to its working by the social development, economic, political and technological environment during this period of time. The existence and quality of a plan of this type is a major indicator of the degree of commitment and seriousness of the leaders of the organization to the project. This information is normally available on the web of the institution.

Secondly, an evaluation is made of whether the action is covered by *legislation* of a general and specific nature and by a favourable political climate by means of the measurement of the number of legal regulations, specific articles and interventions in public political bodies that have been made on the topic.

Thirdly, an evaluation is made of the extent of *alliances* and institutional contacts made by the agency in the area of electronic government, which ensure a firm base of knowledge and sources of information and resources to carry out the project and ensure its success.

Fourthly, an analysis is made of the *human resources* employed within the institutions and in other collaborating agencies and companies, and their level of education provided by the description of the jobs involved.

Fifthly and lastly, an analysis is made of the *financial resources* provided for the action or actions analyzed, and those that are actually spent. This section is essential to obtaining comparative measures that enable the evaluation of the efficiency of the administrative agency and its collaborators when setting up the electronic government service, and the relative efficiency provided by the range of different methodologies and technologies.

3.5.3 Degree of Implementation

A major number of indicators are related to the estimation of the degree to which the electronic government service has been implemented in comparison with the traditional standards of the service and those offered by leaders in the electronic implementation of the service.

Firstly, a study is undertaken of the number of specific services available electronically out of those appearing in the menu of administration services being studied, and an analysis is made of their implementation by government areas, jurisdictional levels and types of relationship between the actors involved.

Secondly, an analysis is made of the level of service on offer in each of the procedures – understood to be critical processes. In accordance with the state of the question on the topic (v.g., Teicher, 2002[47]; Deegan, 2003[48]) there are several levels of interaction, which are increasingly complex from the point of view of the technology

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47 Julian Teicher, Owen Hughes and Nina Dow, 'E-Government: A New Route to Public Sector Quality', in: *Managing Service Quality*, 12-06-02, p. 384–93.

48 Sarah Deegan, *Electronic Government and the Irish Public Sector*, Dublin Institute of Technology, School of Computing. Research Paper (ITSM), DIT, Dublin 8, Ireland, 2003, <http://www.comp.dit.ie/rfitzpatrick/MSc_Publications/ 2003_Sarah_Deegan.pdf> (consulted 08-01-07).

used and more effective and efficient from the point of view of the outcomes: simple information, interaction of information and questions and responses through forms, economic transactions, monitoring after the procedure, and integration of services. For example, in the case of inheritance tax, the first level would be a web page that explains what it is, and where and how it is paid; the second level would be a website that enables you to ask the Inland Revenue administration questions about the topic and to send data in forms; the third level would involve resolution and payment procedures online; and the fourth level, the ability to consult the procedure whenever we want and to transfer, for example, data on new properties to the part of the income tax declaration that concerns the estate of the person making the declaration.

3.5.4 Ease of Navigation and Information Retrieval

An important group of indicators are related to the evaluation of the ease with which the user of the service can reach the website, search for information on it and move around the different contents on offer-navigate.

Firstly, it is essential for the web service to be easy to locate on the immense World Wide Web. The integration of the electronic government service within the portals of the electronic government in a general manner – such as www.060.es – guarantees access, as does the fact that it is easily retrievable on the main search engines – especially *Google* –, and appears in the main catalogues of electronic government services. Lastly, it is of course essential that it can be easily found on the web page of the institution or institutions on a higher level to which it belongs.

Secondly, another key aspect for the user is navigability, which is the ease with which one can move around the different pages of the website and to other relevant information from any point of the site. Navigability is increased by means of the existence of menus that are clear, always present and consistent around the site and numerous internal and external links – inside and outside the website being

studied respectively –, which facilitate navigation to complementary information of interest, whether it be more generic, specific or just related. On the websites aimed at different types of users – executing different procedures and requiring different information – there must be a menu that discriminates and organizes the information by user profiles. It is essential for the interface to be clear and for the user to dispose of a map of the service – at the very least a systematic list, although a complementary graphical presentation can also be very useful. The existence of an alphabetical index is also a major plus, because it enables quick searches for terms within a selected area.

Thirdly, it is important for the website to have a good search engine that finds pages that contain certain words according to conditions specified by the users. Some characteristics affecting the quality of this service are the search operators, the establishment of rankings of relevance first providing documents more likely to resolve the needs of the user and the use of controlled metadata to improve the relevance and exhaustiveness of the searches. The current analysis model evaluates the first aspect (table 3.1).

Operator	*Functionality*
Chains of more than one word	Avoiding noise by searching for words together, for example in inverted commas.
Qualification operators	Restricting searches to a field.
Logical operators	Restricting searches by including a condition for the appearance of new terms (intersection operator, AND), broadening with others (union operator, OR) or excluding terms (exclusion operator, NOT) you do not want to appear in the results.
Comparison operators	Limiting searches to or from a number, letter or date, or within an interval.
Shortened operators	Using wild-card characters (*,?) for terms with the same root and very similar words.
Proximity operators	Searching for adjacent words within a range of words, in one direction or not.
Thesaurus or classification	Limiting searches to a group of terms ordered systematically in a list and navigating through differing interrelated lists.
Simplified operators	Displaying the operators graphically using text boxes and simple symbols.

Table 3.1. Some of the main functionalities of the search engines

As a general rule, the more alternatives provided by the site for searches and navigation, the easier it is for each user to find the route they require to access the information and services of interest to them.

3.5.5 Accessibility and Availability of the Service

This group of indicators measures whether pages can be effectively accessed – without incorrect links and during the necessary amount of time – in the required languages – at least those of users established legally and in English –, by collectives with special needs – meeting the recommendations of the Web Accessibility Initiative (WAI) – and by means of the main browsers available on the market for the range of different platforms, with regard to which versions are still used by a significant number of users. Accessibility ideally involves making the information available in a number of different media: audio, video, images, maps, Braille and any other suited to the audience and the proposed objectives.

3.5.6 Up-to-Dateness

Keeping the information up-to-date is a key aspect of quality. Out-of-date information is worse than no information at all, since it provides users with a false security, which may lead them to making bad mistakes. It is therefore essential to provide the date of the creation and modification of every page, so users can at least see for themselves whether they can trust the information or not, and can ascertain the efforts required to check this. A careful audit ascertaining how up-to-date the information is requires a detailed investigation by an expert in the field.

3.5.7 Responsibility

Responsibility is a basic quality of adult human interaction and logically, this is also true of electronic government interactions. Ensuring responsibility first involves guaranteeing the possibility of identifying the institution responsible for the service – all pages must

therefore identify the responsible institution and department and ideally the person who is responsible –, make contacts possible – i.e. pages must offer contact information or provide for dispatch to them –, inform users of their rights without any doubts or ambiguity – through links available on each page to the services charter – and allow them to exercise these either anonymously or identified by means of formal mechanisms such as suggestion, complaints and query boxes, or surveys such as satisfaction questionnaires. Feedback is therefore ensured, as are effective quality policies, and in short, a serious and responsible service.

3.6 Summary

This chapter has presented the bases of the analysis and evaluation model for electronic government proposed in this monograph, the detailed questionnaire of which is included in its entirety in the appendix at the end of the book. Evaluating services and products involves specifying the group of characteristics that define them. This is normally done by means of the compilation and analysis of the relevant properties of the range of proposals on the market or in the area of comparison, with special emphasis on those that show notable differences. It also involves evaluating the context in which they occur and the possibilities – structures and resources – that enable them to be carried out. To this end, it is useful to employ recognized standards as a base. The model proposed in this chapter is backed by the EFQM model, the Oslo manual and a range of models for evaluating web resources from Biblioteconomy and the field of usability. The analysis model shows that by employing certain resources such as leadership, experts, budgets, contacts, etc. – inputs –, particular procedures can be used to develop electronic government products that facilitate the service provision supplied by the Administrations or the fulfilment of obligations by citizens – outputs. These products have an impact on the users, public-sector workers and society as a whole, ideally in the form of greater satisfaction, more efficiently used resources, etc. – outcomes. The model is specified by a group of 93 indicators that describe the

context, the inputs or resource investments, the outputs or products, and the outcomes for the users. These indicators have been laid out in four questionnaires organized according to the sources it is necessary to consult to answer their questions: 0) Context statistics; I) Information from legal, catalogue and Internet databases; II) Analysis of the website; and III) Interviews with those responsible and experts. The main aspects on which information should be gathered and their importance are then analyzed: the resources employed; the degree of implementation of the services; the ease of locating the site, navigating and searching for information; the availability and accessibility of the service; how up-to-date the information is; and lastly, the responsibility for quality and its policies, and interaction with the site users.

3.7 Activities

1. Why is it as important to analyze the context or the resources behind an electronic government project as it is to analyze the website itself? Give two examples.
2. Either as a group or individually place the sections analyzed in point 3.5 in order of the importance they have for each of you. Explain your reasons.
3. Either as a group or individually, apply the questionnaires in the appendix to a particular group of electronic government services – town halls, regional governments… by sectors or in combination. Set up a ranking for the services. Compare the results with other people who have made intuitive judgements. Discuss the differences.
4. Interview someone responsible for electronic government services on the importance of the criteria under analysis.

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CHAPTER 4
REGULATORY ASPECTS: BASIC PRINCIPLES

4.1 Introduction

4.1.1 The Electronic Government Law

We can no longer discuss Electronic Government as mere oft-referred to reality or experience; the relevance of the question is now such that in Spain, as in other countries, Electronic Government has been regulated, by means of Law 11/2007, of the 22nd of June, for the electronic access of citizens to Public Services[49].

So what is the Law all about? The basic topics tackled in the law are as follows:

- The list of the rights citizens hold to communicate with the Public Administrations by electronic media;
- The definition of electronic headquarters;

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49 <http://www.boe.es/boe/dias/2007/06/23/pdfs/A27150-27166.pdf> (consulted 18-08-09).

- Identification and authentication;
- Electronic records, communications and notifications;
- Electronic documents and files;
- Electronic management of procedures;
- Cooperation between administrations in order to promote Electronic Government.

The Ministry of Regional Policy provides information on the process for the creation and application of the Law on its webpage[50]. We summarize the most important characteristics of the Law below:

- The citizens will have new rights recognized for their relations with the public administrations.
- The creation of the figure of the Defender of the User.
- The administrations will be obliged to make these rights effective from 2009 on.
- Procedures and formalities will be able to be made anywhere at any time.
- The administration will be made easier, quicker and more effective.
- Citizens will hold greater control over their interactions with the administration.
- The law is one of consensus. All administrations, citizens, parties, companies and associations have participated in its creation.

4.1.2 The Purpose of the Regulation

The Law has been organized into five titles, six additional orders, one transitory order, one repeal and five end orders.

We will summarise the basic contents of the regulation starting with the description of its purpose below.

The preliminary title includes the definition of the purpose and goals of the law, the general principles it is based on, and its area of application.

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50 In reference to the reform when discussing the Service Charters: <http://www.map.es/documentacion/cartas_de_servicios.html> (consulted 18-08-09).

Of note is the granting of its basic character of law, which means it is to be applied to all Public Administrations, by virtue of regulations laid down article 149.1.18.[a] of the Constitution, which attributes competencies for the bases of the legal regime of the Public Administrations and for common administrative procedures to the State.

Article 1, included in the preliminary title, defines the basic right recognized by the law as:

> 1. This law recognizes *the right of citizens to communicate with the Public Administrations by electronic media* and regulates the basic aspects of the use of information technologies in administrative activities, in relations between Public Administrations, and in relations between the citizens and these in order to guarantee their rights, a common treatment before them and the validity and effectiveness of the administrative activity in legally secure conditions.

Article 1 also refers to Electronic Government contents:

> 2. The Public Administrations *will make use of information technologies in accordance with that which is laid down in this law*, to ensure the availability, access, integrity, authenticity, confidentiality and conservation of data, information and services managed in the exercise of their competencies.

The general principles of the activities regulated by the Law, and which explain what Electronic Government involves, are described in article 4 of the preliminary title, which explains:

> The use of information technologies will have the limitations established by the Constitution and the rest of the legal code, and will respect the full exercise of the rights of the citizens, and will work consistent with the following principles:
>
> a) The respect for the right to the protection of personal data in the terms laid down by Organic Law 15/1999, for the Protection of Personal Data, in other specific laws regulating the handling of information and in their development norms, and in rights protecting honour and personal and family intimacy.
>
> b) The principle of equality in order to prevent electronic media from ever restricting or discriminating against citizens communicating with the Public Administration using non-

electronic media, respect for access to the provision of public services and respect for any action or administrative procedure without affecting the measures aimed at incentivizing the use of electronic media.

c) Principle of accessibility to the information and services by electronic media in the terms laid down by current regulations in this area through systems that enable their obtainment securely and understandably, where guarantees are provided for universal access and the design for all the support media, channels and environments is made so that any person can exercise their rights in equal conditions, by including the necessary characteristics to guarantee the accessibility of groups that require this.
d) Principle of legality as regards the maintenance of the integrity of the legal guarantees of the citizens before the Public Administrations laid down in Law 30/1992 for the Legal Regime of the Public Administrations and Common Administrative Procedures.
e) Principle of cooperation in the use of electronic media by the Public Administrations for the purposes of guaranteeing the interoperability of the systems and solutions adopted by each of them, and when appropriate, the joint provision of services to citizens. In particular, the mutual recognition of electronic documents, and the identification and authentication media adjusted to that which is laid down in this law will be guaranteed.
f) Principle of security in the implementation and use of electronic media by the Public Administrations, by virtue of which at least the same level of guarantees and security will be demanded as required for the use of non-electronic media in administrative activities.
g) Principle of proportionality by virtue of which only those guarantees and security measures suited to the nature and circumstances of the different procedures and actions will be demanded. Similarly, only those data strictly necessary for the purposes for which they are requested will be required of the citizens.
h) Principle of responsibility and quality in the veracity and authenticity of information and services provided by the Public Administrations employing electronic media.
i) Principle of technological neutrality and adaptability to the development of electronic techniques and communication

systems by guaranteeing the independence of choices made by citizens and Public Administrations of technological alternatives, and freedom to develop and install technological advances in a free market environment. To this end, the Public Administrations will employ open standards and, when appropriate and as a complementary measure, standards that can be employed by citizens across the board.

j) Principle of administrative simplification, to substantially reduce times and deadlines for administrative procedures, and to increase the effectiveness and efficiency of administrative activities.

k) Principle of transparency and publicity of procedures so that the use of electronic media fosters the maximum dissemination, publicity and transparency of administrative activities.

The following section will provide a summary of the contents of the rest of the regulation.

4.1.3 Citizen Rights

The first title includes the rights of the citizens when communicating with the Public Administrations using electronic media.

The list of rights is as follows (article 6):

> 1. Citizens are granted the right to communicate with the Public Administrations by means of electronic media in order to exercise the rights laid down in article 35 of Law 30/1992 of the 26th of November for the Legal Regime of the Public Administrations and Common Administrative Procedures[51], and to obtain

51 Article 35. *Citizen Rights*. The citizens, when communicating with the Public Administrations, have the following rights:
A) To be informed, at any time, of the state of the handling of the procedures in which they are an interested party, and to obtain copies of documents contained in these. B) To identify the authorities and personnel serving the Public Administrations under the responsibility of which the procedures are being undertaken. C) To obtain a stamped copy of the documents presented, provided alongside the originals, and the return of these, except when the originals are required for the procedure. D) To use the official languages of the territory of their Autonomous Region, in accordance with that which is laid down in this Law and in the rest of the Legal Code. E) To formulate declarations

information, make inquiries and declarations, formulate requests, express desires, make payments, complete transactions, and oppose resolutions and administrative actions.

2. In addition, citizens have the following rights concerning the use of electronic media in administrative activities, in the terms laid down in this law:

a) To choose the channel through which to communicate using electronic media with the Public Administrations from those available at any time.
b) To not provide data and documents already in the hands of the Public Administrations, which will employ electronic media to obtain this information provided, in the case of personal data, the interested parties consent to this in the terms laid down by Organic Law 15/1999 for the Protection of Personal Data, or a regulation of the level of Law determines this, unless there are restrictions concerning regulations applied to the data and documents being retrieved. The above-mentioned consent can be issued and accepted using electronic media.
c) To equality in electronic access to the services of the Public Administrations.
d) To ascertain the state of the processing of the procedures of interest using electronic media, except in the event that applicable regulations lay down restrictions to accessing information on them.
e) To obtain electronic copies of the electronic documents making up part of the procedures in which they are interested parties.
f) To the conservation of electronic documents making up part of a dossier by the Public Administration in electronic format.

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and to provide documents at any stage of the procedure prior to the hearing, which must be taken into account by the competent body when formulating the resolution proposal. F) To not present documents not required by the regulations applicable to the procedure being handled, or which are already in the hands of the Administration in question. G) To obtain information and guidance on the legal or technical requirements the current regulations impose on projects, actions or requests to be made. H) To access the records and files of the Public Administrations in the terms laid down by the Constitution and in this and other Laws. I) To be treated with respect and deference by the authorities and public sector workers, who are there to facilitate the exercise of their rights and the fulfilment of their obligations. J) To demand the responsibilities of the Public Administrations and the personnel working for them, when legally appropriate. K) Any other recognized by the Constitution and the Law.

g) To obtain the necessary electronic identification media, where individuals can make use of the electronic signature systems of the National Identity Document for any electronic business with any Public Administration.
h) To security and confidentiality guarantees for the data appearing in files, systems and applications of the Public Administrations.
i) To the quality of public services provided using electronic media.
k) To choose applications or systems for communication with the Public Administrations as long as they employ open standards or are those that are widely used by citizens.

In order to guarantee the full exercise of these rights, the Administrations are endowed with the obligation to set up a range of channels and media for the provision of electronic services.

Each Administration is also endowed with the obligation of providing other Administrations with the data of interested parties, which are required of them and in their hands, when handling a procedure, provided the interested party provides their express consent, in order for citizens not to have to supply data and documents already in the hands of the Public Administrations.

The figure of the Defender of the User of electronic government is created in the General State Administration, to safeguard the rights granted to the citizens in the Law, without detriment to the competencies attributed in this field to other bodies and organizations defending public rights. The appointment will be made by the Council of Ministers at the recommendation of the Ministry of Public Administrations selected from a group of persons of recognized prestige in the area. The post will belong to the Ministry of Public Administrations and will undertake its functions impartially and independently.

4.1.4 The Workings of Electronic Government

The second title regulates the legal regime of Electronic Government.

Its first chapter is devoted to the electronic headquarters, the electronic address available to citizens through telecommunications networks the ownership, management and administration of which as an electronic address corresponds to a Public Administration working with all the responsibilities as regards the integrity, veracity and up-to-dateness of the information and services that can be accessed therein. The regulations for the development of the Law state that each Administration will determine the instruments for the creation of electronic headquarters. Equally, the effects of the publication of official journals or bulletins in particular electronic headquarters are established, especially as regards the 'Official State Bulletin'.

The second chapter regulates means of identification and authentication, of citizens and administrative bodies when exercising their competencies. Worthy of mention is the activation of a range of accreditation instruments, which will be specified in the regulations applicable to each area with proportionality criteria. The National Identify Document is validated in general for all communications with the Public Administrations. The obligation is also set up for all Administrations to admit the electronic certificates recognized in the area of the Electronic Signature Law.

Also worthy of special mention here, and in order to prevent the digital divide from widening, is the possibility of public sector workers accrediting the will of citizens, by employing the established procedure, for their electronic communications with the Administration.

The third chapter regulates electronic records, communications and notifications. The main novelty in this regard is the new regulation of electronic records, in such a way as to turn them into an instrument that escapes the current rigidity and serves for the presentation of any communication or request made to the Public Administrations.

The Law regulates electronic communications made between citizens and the Administrations, and between Administrations, to unite the criteria laid down for speed and legal security.

The fourth chapter, on electronic documents and files, establishes conditions for the recognition of the validity of electronic documents, and regulates the entire system for electronic copies, made from documents originally issued on paper and from copies of documents already on electronic support media, as well as the conditions for providing hard copies of originals originally issued on electronic media, and vice versa.

The third title tackles the electronic management of procedures, and develops the regulation of administrative procedures using electronic media and the criteria employed in electronic management, where it is similar in nature to the regulation of Law 30/1992 for the Legal Regime of Public Administrations and Common Administrative Procedures. The initiation, instruction and termination of procedures using electronic media are thereby regulated.

Worthy of special mention in this title is the obligation established for Public Administrations to place information at the disposal of users employing electronic media on the state of the processing of procedures, both those managed entirely by electronic media and other procedures as well.

The fourth title is devoted to cooperation between Administrations in order to promote Electronic Government. The body of the General State Administration in this area is established for cooperation with the Autonomous Regions and with Local Administrations, and the principles required to guarantee the interoperability of information systems and the foundations for promoting the reuse of applications and technology transfer between Administrations are determined.

Lastly, the Law includes six additional orders: one transitory order, one repeal and five end orders of which the first end order is especially relevant. It lists the precepts of the law of a basic nature under the auspices of article 149.1.18.[a] of the Constitution, as mentioned above.

Special interest should also be paid to the third end order, since this marks the dates on which the full rights of citizens when

communicating with the Public Administrations using electronic media come into force, and lays out the deadlines considered appropriate for the different Public Administrations to carry out the necessary preparation work. Specifically, it sets out that the rights laid out in article 6 can be exercised in relation to all the procedures and actions of its competency from the 31st of December 2009, at least as regards the General State Administration. For other Administrations (regional and local) the same schedule is used, but they depend on their respective economic plans and forecasts.

4.1.5 Purpose of the chapter

This chapter tackles the following[52].

We provide the reasons why the study of the current regulations of information and communications technologies, in this case regulations concerning access to programmes and systems making up Electronic Government, has to be completed, as demonstrated by the brief contents of the Law, employing the characteristics of the professional activities of IT technicians and the fact that they are regulated by criteria contained in legal texts, technical standards, codes of conduct and policies adopted by the competent institutions and organizations since the nineteen seventies, the contents of which are synthesised in the description of general principles and rights of citizens in the Law. We reach this point after a brief description of the evolution undergone by the basic contents of the mechanisms that safeguard the security and justice of any information system that is employed as an IT application.

Specifically, the first section (4.2) briefly describes the 'spirit' of the evolution of the regulation: How, since the regulation of ICTs is based on the term *privacy*, the regulation of the activities of IT technicians by the legal code as a whole was attended to later, and is still true today.

52 The theoretical framework of the Chapter is described in the texts included in Galindo, ed. (2006).

The following section (4.3) presents several regulatory examples to show that the study of the consequences of the activities of IT technicians is the most suitable starting point for its legal consideration.

Sections 4.4 and 4.5 will then describe how, as a result of recent growth in the development of electronic communications, regulations have begun to guarantee, in addition to the protection of personal data, the secrecy of communications, and especially the possession of codes for ciphering and deciphering electronic messages.

In section 4.6 we will mention the relevance of Codes of conduct as regulatory instruments in the field of ICTs.

The last section (4.7) will propose the most suitable synthesis of the above-mentioned approaches as being the establishment of the connection between consent, understood as the exercise of the principle of IT self-determination by citizens and the exercise of the laws, and the activities of IT technicians in relation, in this case, to the exercise of Electronic Government, the basic regulatory principle for setting it in motion.

4.2 From Privacy to IT Technician Activities

The most important thing for legal professionals and other interested parties as regards the relationship between Law and Information Technology, regardless of the specific aspect under study, is the consideration of the political and social interdependencies of the activities of communication and information technologies (ITCs), or in other words, the valuation of the degree of justice, legality, and acceptance or consent achieved by the applications or programmes constructed by IT technicians, and which work in specific environments. This is the case because the most pertinent evidence arising from even the most insignificant study into the use of these technologies on a daily basis concerns the fact that the consequences

of this use for any activity are not identical to those for the same activities when they are undertaken without the assistance of the new technologies.

As a result writers have for some time been drawn to detailed treatises on the rational, social and working implications of the use of the Information and Communications Technologies[53].

When considering the use of the ICTs by the Public Administrations, this means being aware of the fact that when someone writes a document using a computer they must know it no longer has to be rewritten by an auxiliary or administrative worker in the office, and neither are copies required, and it can be seen by someone who uses the computer later, if the document or computer does not have its access protected against other users. In sum, the user must know the document can be written and reproduced by employing the guidelines on practice and uses in the writing of documents introduced by the creators of the programme for the word processor used by this specific person.

If the document is linked to another, this is because of the instructions of the programme. Here the user must know the programme automatically generates a new document, the contents of which should be gone over in order to check whether the text generated is suited to the use for which it is destined. They should realise the automatic generation is the result of instructions contained in the programme and entered by its creators.

When someone accesses a legal data bank and retrieves documentation, they must be aware of the fact that their action differs from the norm when accessing records stored on paper. The person accessing the documentation 'electronically' has been able to do this because they have made use of knowledge of documentation developed and systematised, partly by a greater number of people, partly automatically.

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53 Still paradigmatic Steinmüller ed. (1988).

When someone, a public-sector worker for example, operates using work flow tools, which aid the processing of administrative procedures, they must be aware of the fact that the sequence of the processing has been established by other people who have made an initial study of the procedures and more or less arbitrarily set up particular rules, maybe insufficiently clear in the laws, which are the ones that determine its 'legal' trajectory.

If electronic mail is used to send documents, it is essential to know that in the event of problems arising with their dispatch or reception, proof of having sent documents will require the intervention of electronic communication certification service providers.

In summary, a user of an IT system, whether they are a public sector worker from the Public Administration or a citizen gaining access through the use of ICTs, must be able to differentiate between what they are providing and what is being provided by the system. It is also essential for them to be aware of the capacity and power of the tools, which for example, enable easy access to personal information on other people, and leave traces of the activities the user-citizen-public-sector worker has undertaken when using the application or programme.

These examples demonstrate the reason why in this book we prefer to talk more about legal criteria devoted to preventing the political and social repercussions of activities undertaken with the aid of ICTs in the context of the work of the Public Administrations, than just about the infringement of privacy and personal intimacy, the exclusive subject of many papers and regulatory proposals in fields related to Electronic Government.

This being the intention, we have only made special reference to the protection of personal data in the last of the above-mentioned cases. The others focus on the fact that, in addition to possible violations of personal information, the use of the ICTs in specific activities always introduces one or more third parties, whose actions may interfere with the characteristics and consequences of the actions carried out by the user. This means the perspective adopted here counts on the

existence of the legal code in its entirety, in addition to the principle of privacy or intimacy, which has regulated specific aspects of the use of ICTs over recent years: since their employment for more than just military, scientific and technical ends, but also for social purposes.

It is to be noted that for quite some time now, there has been a great deal of literature that presents arguments on the difficulties involved in the use of the new technologies and proposes policies and solutions to mitigate these. There is insufficient space in this book to even summarise these arguments. Those interested can consult the corresponding literature[54]. Nevertheless in other sections (4.4 and 4.5) we make a brief historical reference to the expansion of basic policies made for the regulation of information and communications technologies. Prior to this, in the following section we present the general principles contained in current regulations aimed at solving the social and political consequences of the use of ICTs. These principles refer to the regulation of the activities of IT technicians.

4.3 IT Technician Activities

Some time ago, as will be shown below, a decision was taken to place emphasis on the characteristics of the technical aspects regulated in the regulation of the consequences of ICTs. The most significant precedents can be found in the regulations concerning data protection or personal information. This is the same as saying the regulations are concerned with the activities of IT technicians, since the techniques always have to be undertaken by someone or other. In this case it is the IT professionals or technicians the regulations are aimed at.

This trend has been on the increase in recent years. This is normal: corresponding to fact the ICT Society or Knowledge Economy is already a reality. We will provide some significant examples below:

54 An informative work on this area is Murillo and Bello eds. (2005)

With regard to the regulations for electronic signatures (Spanish Law 59/2003, of the 19th of December for electronic signatures), its purpose centres principally on the regulation of the use of coding techniques, specifically cryptography known as Public-key, which enables a secure link from information that identifies a person or their written texts to the digital certificate used by this person to identify his or herself or to encode the text.

The same occurs in the Law of information society services (LSSI: Law 34/2002, of the 11th of July, for Information Society Services and Electronic Commerce), also known as the electronic commerce law, which is actually the law that regulates the activities undertaken by providers of access to information systems, or which ensures all the technological infrastructures that maintain the use of Internet and communication devices such as mobile phones work.

Another example of the same thing is the Law for electronic access of citizens to the Public Administrations, which is the reference for this book. As was made clear when we described its basic contents (4.1 above), the Law is charged with regulating the right of citizens to employ electronic media to communicate with the Public Administrations as an individual right (art. 1.1). This is an important novelty in that up until now there have been regulations concerned with advocating the use of electronic resources by the Public Administrations, but they were never obliged to make this use. The important thing to be pointed out here is however, that the Law also regulates the foundations required for the exercise of the right: what is known as the Electronic Government.

As the Law attests (art. 1.2): its purpose is to regulate *the use of information technologies by the Public Administrations… 'in accordance with that which is laid down in this Law to ensure the availability, access, integrity, authenticity, confidentiality and conservation of data, information and services handled during the exercise of their competencies*'. The affirmations are defined in Article 4 in the general principles for the activities of the Public Administrations when using electronic media.

This is the same as saying the Law is charged with regulating Electronic Government; all the technical resources required for its implementation. That is why the Law regulates the establishment of clearly defined and locatable information systems (records), which must serve to grant secure access to the services provided by the Public Administrations to citizens and public sector workers in addition to laying out the general principles for the actions of the Public Administration; for the public sector workers employed. Public sector workers and citizens who are clearly identified by means of administrative procedures using electronic media and the criteria to be employed in electronic management.

And that is why we say this regulation, and the other above-mentioned regulations, are charged with regulating the activities of IT technicians.

This means in order to become familiar with and understand the legislation concerning ICTs, first you need to be familiar with the technologies, or at least the general characteristics of the activities of the IT technicians setting them up.

As in the case of the Law for electronic access to the Public Administrations, this is more necessary still, if we understand the inevitable need, as a guarantee for the workings of society as a whole, for the establishment, employing the legal code in its entirety, of a series of measures that ensure the activities of IT technicians respect:

- The security of the instruments, the computers and communications networks, and the programmes that make them work,
- The practice of the principle of IT self-determination or the consent of citizens by means of laws that express this and.
- Intimacy.

These measures are required because of the high degree of dependence in existence between the workings of our society and the information and communications technologies. Regard must be given to the fact that the goal of existing measures is to guarantee the workings of society as a whole: civil society and public and private

bodies, market, social assistance, the workings of the State and its agencies, the fight against delinquency, State security[55], actions of the Public Administrations, etc.

As a result, since there are no specific regulations, impossible given the ever-changing nature of the phenomenon, in practice the entire legal code is applied to problems arising as a consequence of the application of ICTs because of the activities undertaken in this field by specialists in the area, the description of which is provided in the regulations approved for this purpose such as the one for the regulation of access to the Public Administrations using electronic media.

4.4 Security Measures and Data Protection

4.4.1 Introduction

The next two sections (4.4 and 4.5) will discuss the most important characteristics of security measures taken in communication and information systems. In both we describe the latest questions under discussion in areas for which regulation is not a simple matter given the political, technological and social framework holding them together.

The sections are different because the matters discussed are also different. The first includes appraisals of the activities of IT technicians that have been settled and recognized in regulations since the nineteen sixties by means of the abstract regulation of concepts

55 Therefore: the Penal Code does not define IT crimes but rather describes criminal behaviour undertaken with the aid of computers throughout its numerous articles. This is significant in regard to the reading of the Preamble of the European Union Directive of the 23rd of October 1995, 'on the protection of individuals as regards the processing of personal data and the free circulation of these data' in which the reasons for this are described in detail, summarized in the expressions cited here. The title of the directive 'free circulation' refers to what is of most importance at this moment in time: safeguarding the market and other fundamental social principles.

such as 'privacy', or 'data protection' and security measures required for personal data protection. The second in contrast, looks at recent proposals concerning telecommunications security.

4.4.2 Privacy or Intimacy

The traditional approach to the regulation of the ICT phenomenon has been from an idea that their uncontrolled exercise could lead to serious affronts to personal intimacy, or privacy. The use of these instruments was seen as leaving citizens overly exposed, especially in relation to the State, which is the body best equipped with these, in order to govern, order, and in sum, control citizens. Defence against this control resided in recognizing the fact that one of the fundamental principles of Law is precisely the safeguarding of the intimacy of citizens.

In order to safeguard this Right, a decision was taken to first recognize it more precisely by means of the promulgation of special regulations: laws for the protection of data that were also laws on intimacy or privacy, and second, to set up a special body: the 'Data Defender', the Spanish Data Protection Agency, the main objective of which is the protection of the most intimate data of citizens as regards possible interferences in their use by means of programmes constructed and used by the public powers.

The starting point was the idea that although the state, by means of enormous personal data stores in computers, was fulfilling its duties as a social Democratic State requiring that the public powers obtain, store and process or use personal data, there was potential for it to exceed in its authority. The protection measures for these data guarded against possible excesses in the use of personal data.

Data protection was the first area of interest to the legal sphere. Paradoxically, as we mentioned, the objective being to preserve intimacy or privacy: the protection was understood to be a mechanism required to protect intimacy. The first monographs (at the beginning of the seventies), government reports (at the beginning of the seventies) and specific legislation (law for credit reports, USA,

1970; law for consumer credit, United Kingdom, 1974) and general legislation (law for the protection of data of Hessen, 1970; Swedish data law, 1973) were concerned with this. A great deal of literature is still be generated, also in Spain.

The tensions between intimacy and data protection continue to be strong. This is demonstrated by the Spanish Data Protection Law (Organic Law 15/1999, of the 13th of December for the Protection of Data of a Personal Nature), which regulates data protection and includes the term intimacy: 'Article 1. *Purpose*. The purpose of this Organic Law is to guarantee and protect, as regards the processing of personal data, the public freedoms and basic rights of individuals, and especially their honour and personal and family intimacy'. An ambiguity that is also found in the European Directive for data protection[56].

Despite the persistence of the debate, hardly any attention is paid to the contents: a subjective interpretation has been maintained of what is considered private by individuals who express their opinion within a particular State, and as a result a number of concepts of intimacy or privacy have been maintained in different States through the political and legal bodies that have taken a position.

There is still room for some sort of systemization as regards points in common or certain general guidelines linked to the historical moment in which the respective expressions of opinion were made. We will take a brief look at this below.

In the sixties and seventies there were thought to be few computers, which were in the hands of (feudal) data lords. The historical moment was marked by the 'us' and 'them' syndrome. They were the

56 Directive 95/46/CE of the European Parliament and Council, of the 24th of October 1995, on the protection of individuals as regards the processing of personal data and the free circulation of these data urges (art. 1) the Member States to guarantee 'in accordance with the regulations of this Directive, the protection of the freedoms and basic rights of individuals, and in particular, the right to intimacy, as regards the processing of personal data'.

owners of the computers, and we were exploited citizens, whose personal information, scarce as it might be, stored in the computer was a possible instrument to be used to invade one's personal privacy and to persecute physically. Prophets of doom were everywhere. With the backdrop of the cold war, the control exercised by the machines and their owners was the manifestation of a free society's fears.

The contradiction can be found in the fact that most readers now have their own PC and are connected to the Internet, which doubtless makes it more powerful and with more virtualities than those used by the data lords of the sixties and seventies when these discussions were first held. 'Us' and 'them' have therefore joined forces in today's world.

It has been argued that the large-scale proliferation of small, cheap and powerful computers is in itself a kind of protection of privacy, since the technology is no longer solely in the hands of the (feudal) data lords. It is true there are many more of 'them' today. Nevertheless, the privacy topic has been upheld, the laws use the expression: they now refer to the possible abuse of public institutions, companies and private bodies.

Attempts have been made to specify this, by discussing what the potential abuse consists in. The abuse appears to arise with regard to the purpose for which a computer is used: the abuse of freedom.

This leads into another topic: concerning whether each owner or user of a PC is a potential feudal data lord or an enemy of democracy, in the language of the prophets of doom when pointing to infringements of liberty arising from the handling of personal information guided by the principle of technocracy or effectiveness, or whether each PC owner fulfils a social function. The truth is there are opinions to the taste of everyone. The following survey was carried out in the United States in 1971 in this regard[57].

57 In Saxby ed. (1990), vol. II, p. 16005.

The survey interviewed 1001 people over the age of 18, of which only 15% had a job related to data processing. The question asked was as follows: 'For each type of personal information I mention, please tell me if you think it should or should not be stored in a computer file'.

The responses (as a percentage) are given in table 4.1 below.

	Yes	*no*	*ns/nc*
Police information	83	14	3
Medical information	81	17	2
School information	77	20	3
Tax information	76	22	2
Credit information	75	22	3
Employment information	74	24	2
Salary information	54	43	3
Political activities information	50	45	5
Products purchased	46	47	7

Table 4.1

These responses show that already in 1971, significant majorities of the population were in favour of storing some types of information, in contrast to the opinion of writers who considered the storage and processing of this information a real threat to society. Clearly, people who at that time were not able to own a PC, thought the storage of certain personal data, for example on the possible credit rating of a person, was a socially acceptable phenomenon. Does the fact that everyone can now own a PC and become as powerful as the State change this way of seeing things?

The survey demonstrates above all the highly subjective nature of this sensibility, and probably shows that what is questionable is not really the reason why we store information, but rather whether it is

published. In other words, the reason for storing the information must be known and must be in the public domain or control[58].

This principle has been accepted over time in the laws for the protection of data, since they have stipulated that the main function of the authority responsible is to be constituted as the public register of data and programmes for users of a public nature (the State and its offices) and a private nature (companies).

More on privacy. Those who first referred to privacy left no aspect of the idea unexplored. The debate was held some time before the first major legislation in this respect was passed: in Sweden in 1973. The reason for the slow progress in this field resided, as mentioned above, in the difficulty of finding a universal definition of privacy.

And this is despite the fact that the word 'privacy' appears in Article 12 of the Universal Declaration of Human Rights of 1948 (Art. 12. No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks). The truth is it remains undefined, although according to the Declaration, every citizen of the world has it guaranteed!

It is not however just a problem of doctrine: There are different and conflicting interpretations of the word privacy in different countries. There are different national interpretations of the word too. And

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58 These data were confirmed by the fact that from the initial moment the Spanish Data Protection Agency was up and running, the number of claims and complaints made by individuals has been very small, and when they have been made, they have been made fundamentally in the sector of information concerning solvency, credit and defaulters, where the causes of the claims have centred on the lack of publicity or the non-fulfilment of the obligation to provide for the exercise of the rights of information, access, rectification and cancellation of personal data. This is shown by the initial Memorandums; for example, Data Protection Agency, *Memorandum 1995*, Madrid, 1996, p. 73–80, or in the Memorandum of 1996, and in the more recent ones published in: <https://www.agpd.es/index.php?idSeccion=425> (consulted 08-01-07).

there are also national and personal interpretations of what constitutes an act of invasion, or more importantly, what security measures should be taken to protect privacy.

The disparities are illustrated by the practice: in Sweden where a regulation obliges all citizens to have a personal identification number (TIN), the TIN constitutes the base of Swedish legislation for the protection of data. In contrast in the United Kingdom, any suggestion of all the citizenry being identifiable, for whatever reason, is considered totally unacceptable and highly controversial, since it is perceived as an invasion of privacy. In continental countries, such as France and Spain, it is accepted as normal for every citizen to have a personal file notifying of any change of residence. Nobody questions the existence of the ID card or TIN in Spain. Electronic National Identity Cards are beginning to be used. In the United Kingdom, these requirements would in contrast, be unacceptable. And so it goes on.

There also exists a paradox in these examples. In a society which depends increasingly on the use of computers, an IT system is capable of providing a measure of protection when it is aided by several controlled numerical identifiers. A system of files such as the one for the change of residence in France can help reduce the risks of the unauthorized communication of personal information.

4.4.3 Protection of Personal Data and Security Measures

The exact date on which the transition from the idea of privacy to the idea of data protection took place cannot be determined. A detailed overview of the literature reveals the acceleration of the movement towards data protection during the nineteen seventies, when the specialists in the field, the technicians, joined the debate. During the seventies, the debate was dominated to a large extent by moralists, philosophers and legal professionals.

The technicians placed their main emphasis on the weaknesses of the computation systems, which made commitment an essential step on the road to solutions to the problem of invasions of privacy. Data protection is therefore, essentially a commitment, which rejects the

debate on the type of personal data that should or should not be stored in a computer, and places greater emphasis on the study of the conditions, the security measures, under which the data are stored. At the same time this means discussion moves from centring on an abstract concept such as privacy, to a debate on the characteristics of the professional activities of IT technicians in a plural society, which coincides with the debate being held on activities in other fields, especially in Medicine since it presents the characteristics of informed consent, in that this is the essential mechanism the enables the definition of the responsibilities of doctors.

In the United Kingdom we can date the transition: it took place during the period between the *Younger Committee* report (July, 1972), and the *Lindop Committee* report (December, 1978). The first was entitled the 'Privacy Report', and the second was called the 'Data Protection Committee Report'.

The first referred to the private sector, and proposed ten principles influencing the eight data protection principles contained in the European Council Agreement of 1981[59] and the recommendations of the OECD[60]. The Lindop report referred to the public and private sectors, proposed the establishment of a Data Protection Authority and the use of codes of practice with the power of laws: they began recommendations for the activities of IT technicians. Whatever the case may be, neither of the reports had an influence on the United Kingdom data protection law. It is significant that the law was the result of pressure from commercial interests arising from the possibility of the UK Government not ratifying the 1981 Council of Europe Agreement[61].

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59 Agreement no. 108 of the Council of Europe, of the 28th of January 1981, for the protection of persons as regards the computer processing of personal data.

60 Recommendation of the Council as regards the directives governing the protection of intimacy and the cross-border circulation of personal data, 23rd of September 1980.

61 A history of the birth of the UK legislation in this field can be found in M.G. Losano, 'The origins of the UK "Data Protection Act" of 1984', in: Losano, Pérez Luño and Guerrero Mateus (1989), p. 9–60.

The expansion of the storage and processing of data, as a consequence of the potential developed by technological advances made by the public powers and also companies and the private sector, and the emphasis placed on implementing laws for security measures and the protection of data, especially centred on obtaining consent from the people whose personal data are stored in large computers, led to a change of philosophy in the nineteen eighties as regards the problem of the political and social consequences of the activities of IT professionals and the users of information systems.

The change consisted in the progressive replacement of the philosophy of privacy with one that stressed a basis for data protection laws as residing especially in the fact that the mechanisms, institutions and measures they contained should be the expression of the consent required from citizens to process their personal data, once these were understood to belong to them by virtue of the principle of IT self-determination, explicitly or implicitly laid down as a another individual Right in the constitutions of democratic countries.

The technical proposal had at the same time its legal foundations. This was included in the sentence of the German Constitutional Court of the 15th of December 1983, laid down in the reform of the census law and after a major citizen-centred political campaign, which recognized the need to protect personal data through the adoption of measures and the implementation of the appropriate institutions, the enactment of laws, because there is a right to Information self-determination, or, from another point of view, a right to access to one's own data, or IT freedom, as a right related to the free development of the personality (art. 2.1 of the Constitution). This requires that each IT application must be clearly, precisely and particularly accepted or consented by the individuals involved. As the technicians pointed out, it is necessary to pay attention to the study of the conditions in which the data are stored.

Spanish regulation shares the emphasis on the protection of data, the security measures and the codes of practice or conduct, at the same time as discussing intimacy, which is understood as normal when the

1978 Constitution (art. 18.4) prescribes the link. In a sentence made on the 20th of July 1993, the Constitutional Court accepted the principle of self-determination, and accepted that the Constitution recognizes 'the right to freedom from potential aggressions against the dignity and liberty of people resulting from the illegitimate use of automatic data processing, which the Constitution refers to as 'informatics'[62].

Summing up, basically three mechanisms have been established to defend data protection:

- The regulation of the security measures, basically constituted by the composition established for the activities of IT technicians thanks to the uses or rules adopted by professional practices and the prescriptions contained in laws.
- The actions of institutions devoted to data protection, aimed especially at safeguarding the satisfaction of the principle of IT self-determination or consent, and more generally, the normal development of daily life, for technicians, the State, companies and citizens or users in general.
- Other instruments, of a moral nature, with a long-established tradition in professions other than IT technicians: the professional codes of conduct.

4.4.4 The Regulation of the Electronic Government Law

As mentioned above, and consistent with what has been said up to this point, in the Law for electronic access to the Public Administrations, the following general principles are regulated for the application of the Law (art. 4), amongst others:

- Respect for the right to personal data protection in the terms laid down by Organic Law 15/1999, for the protection of personal

62 On IT freedom see: A.E. Pérez Luño 'IT freedom. New frontiers for Fundamental rights', in: Losano, Pérez Luño and Guerrero Mateus (1989), p. 137–62.

data, in other specific Laws regulating the processing of information and in their norms for development, and for rights to personal and family honour and intimacy.

- The principle of security in the implementation and employment of electronic media by the Public Administrations, by virtue of which at least the same level of guarantees and security will be required as required for the use of non-electronic media in administrative activities.
- The principle of technological neutrality and adaptability to the progress of electronic communications techniques and systems where guarantees are provided, by means of the use of open standards and internationally recognized standards, for the independence of choices of technological alternatives made by the citizens and the Public Administrations, and for freedom to develop and implement technological advances in the domain of the free market.

4.5 The Security of Electronic Communications

It is essential to focus on a recent phenomenon, in expansion since the beginnings of the nineteen nineties, for which the above-mentioned legal solutions referring to the safeguarding of intimacy and data protection are not enough. This phenomenon is the development of telecommunications and the expansion of the resources and potentialities of information technologies around the world as a result of Internet.

Worthy of attention here are the practical and legal problems involved in the use of these technologies, which have a different reach to those mentioned up until now. This is the case because the principle of the division of political powers and the infringement of other freedoms are at stake here. We will refer to this below.

The interest in guaranteeing the secrecy of communications derives in the existing need to use cryptographic techniques as complementary tools for the use of the ICTs. Cryptographic

techniques are accepted as one of the most suitable remedies for overcoming the weaknesses of Internet[63].

The weaknesses of Internet consist in mechanisms for the workings of the network enabling the interception of messages sent by its users. The network works by means of the dispatch of packages of information between senders and receivers from one part of the world to another, using computers connected to it. This makes it is easy to observe the contents of messages containing the numbers and passwords of credit cards for example, or other types of communication undertaken by the users. Neither it is possible to ensure the security of the identity of the interlocutor.

This generates several disadvantages for the medium. The main one is the fact that these practices are detrimental to the security and confidence of electronic commerce, a source of wealth and work. This is a concern for industry and governments, and at the same time, limits the expansion of Internet. Freedom to trade cannot be met satisfactorily, if there are information transmission channels as vulnerable as they are at the moment. This is also true if technical solutions contrary to the fundamental principals of the established legal code, such as the principle of communications secrecy, are adopted. The problem multiplies when considering electronic access to the Public Administrations: not everyone can access particular information. It is necessary to be sure of the identity of the person the information (always of a personal nature) is being sent to, etc.

One of the consequences of all this, as well as being one of the essential remedies to mitigate the problems, resides in the acceptance of the use of cryptographic techniques for the transmission of communications. Others, of the same or more importance as the first, are constituted by the violation of the democratic division of power, the preservation of intimacy, the freedom of expression, the principle of public security and public faith, as we will describe

63 To this effect there is an OECD Council Recommendation as regards the directives for cryptographic policies, 27th of March of 1997.

briefly below. The consequences demonstrate the cryptographic solution as we will see.

This is the case because although the coding resolves the identification and even confidentiality or intimacy problems, it creates many more. From a legal point of view, the most important problem is the one concerning power. Specifically, the problem of the possession of coding and decoding keys. In two cases: safeguarding the keys and the identification of the people. In both cases the holder of the keys can dominate the user of these, even more effectively in fact than by using arms. This is one of the reasons why cryptographic resources are compared to armaments in regulations on the limits to the exportation of products with twofold uses, as described in treaties and agreements currently in force.

In this field, the established mechanism for the protection of personal data, the data protection Agency, is of no use, since the preservation of the private key or the secret of the communications are not functions of the Agency. Its function, as described above (4.4), consists in showing the existence of IT files of a public or private nature containing stored personal information. The exclusive purpose of this declaration is for the citizens to be able to execute democratic controls over this information, once they are provided with the right to IT self-determination.

The transmission of private keys to this institution and the deposit of these, would in contrast mean the establishment of a dangerous central –state– unit of control over the keys. The agency would serve the opposite purpose for which it was created. It would become the central body of an organization holding all the secrets (public and private)[64].

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64 It is not surprising therefore that the Spanish legal code has an administrative body to guarantee the security of transmissions made between organizations making up the Public Administration, and the National Mint and Stamp Factory (FNMT), a body belonging to the Ministry of Economy and Inland Revenue, characterized institutionally by the provision of reliable services in a highly sensitive and necessarily

The problem of the power of the key results in another: the restriction of the freedom of expression. This occurs because the technical solutions, above all those that prevent the observation of the contents, facilitate the freedom of expression but hinder and sometimes prevent actions aimed at the prevention of offences: the legal interception of telecommunications. This requires setting up measures to enable the interception of messages by security services and the generation of possible excesses that could affect the principle of freedom of expression, and of course the principle of personal intimacy.

A no lesser problem, also concerning power and more specific than those mentioned above, is the fact that the implementation of security measures, consisting in the use of coding techniques, requires the establishment of organizations adapted to the security and confidence networks for economic, social and communications relations currently in existence, and in existence since the beginning of the nineteenth century when liberal states were being put in place. That was when state registries were set up, the aim of which was to facilitate and protect the exercise of the rights of people, especially the right to freedom and autonomy of will, put in place for the practice of mercantile traffic and participation in the elections of governors by means of the vote.

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neutral field such as the manufacture of money. What is more, the FNMT carries out actions all around Spain in collaboration with the Mailing and Telegraph Business Public Body (art. 79.5 of the Law for fiscal, administrative and social order measures for 1998), a respectable body to which we would assume its own competency is to be charged: the faculty of registering the data of those citizens that are interested in using the cryptography in their relations with the Administration. We should add that the Law does not modify the registration functions specific to the Public Administrations. All of which is consistent with the fact that the 'General Telecommunications Law' establishes the general principle for the regulation of cryptography of 'being able' to employ the coding (art. 52.1: 'Any type of information circulating through telecommunications networks can be protected by means of coding procedures. Conditions can be set up for the coding procedures in the norms for the development of this law'). This means the present and future Spanish code, does not at the moment lay down anything as regards the deposit of private codes, which is consistent with the regulations that do not lay down the obligation to deposit private codes, as is the norm across Europe.

The essential problem in this field now resides in the fact that telecommunications, the resources of which employed through the Internet were first used in the democratic country of the United States, organized in a different way from most European countries, are introducing newly designed institutions and companies as the basic agents of the network. As a result, in practice the new techniques change an essential legal system of the Democratic State: the system of public faith, the cornerstones of which are constituted by a range of public notary agents; notaries and public registries of a legal or administrative nature.

It is clear the solution to these problems is not reached with the regulation of intimacy, data protection or IT self-determination. The solution will be found as a consequence of putting two procedures into practice.

- The first consists in the use of mechanisms and institutions required for the coding of messages that:
  - Enable guarantees for dispatch and destination, or in other words, ensure with a high degree of certainty the issue and arrival of the message, the day and time this is done, who has sent it and who has received it, and the fact that its contents have not been altered, and
  - Prevent the viewing of the contents of communications.
- The second remedy consists in reconciling the use of the above-mentioned mechanisms with the meeting of the current legal code, given that the use of the coding of messages involves serious consequences for the essential principles of the legal code as described above.

This is all tackled by the regulations for electronic signatures and the following general principles (art. 4) concerning access by electronic media to the Public Administrations included in the Law we are using here as a reference:

- The principle of cooperation in the use of electronic media by the Public Administrations in order to guarantee the interoperability of the systems and solutions adopted by each of them and, when appropriate, the joint provision of services to citizens. In

particular, the mutual recognition of electronic documents and the means of identification and authentication adjusted to that which is laid down in the law will be guaranteed.

- Principle of security in the implementation and use of electronic media by the Public Administrations, by virtue of which at least the same level of guarantees and security required for the use of non-electronic media in administrative activities will be compulsory.
- Principle of responsibility and quality in the veracity and authentication of information and services offered by the Public Administrations using electronic media.

The regulation of identification is the direct purpose of the standards in the second title of the Law.

4.6 Codes of Conduct

Activities undertaken with the aid of new technologies can be carried out in a plural manner, with priority placed on the satisfaction of certain qualities of the activities or techniques, and on certain values, principles or political conceptions, as is the case for the practice of any other professional activity. Codes of conduct are concerned with this topic.

Codes of practice or codes of conduct, in the context of this study, are systemizations of the essential mechanisms for action and defence as regards existing new technologies, drawn up employing values by the professionals who must apply them or by other institutions using existing regulations and uses, to be applied by organizations or companies and their operators, the principal task of which is not only the application of new technologies, but also the execution of any of the myriad activities undertaken on a daily basis with the aid of the new technologies[65].

65 Very varied codes of practices exist: they exist for the police, and also for dentists or secondary schools or universities, or for IT professional associations…

This means reflections are to be made on the range of types of codes that can be referred to when the term is employed in the field of knowledge this study is limited to.

The following contents are included in the term code in the continental legal domain. For a legal professional, the code is a group of laws, created by the Parliament, which regulates a specific area of law employing a systematic and methodical plan. We are not referring here to this meaning of the term. Here we refer to a code of conduct as a group of regulations or guidelines for behaviour, which, in relation to a systematic and methodical plan, regulate the conduct of the creators and users of the information and communications technologies as regards security measures, including those concerning identification using a public key, and data processing.

Little detail has been given here. Further clarifications are required, because, as will be seen in this section, with regard to the difference between legal codes and codes of conduct: the circumstance of their creation by the Parliament or other institutions means there are several possible contents for these codes. There are also different contents of these when they are considered from a perspective of the particular rationale guiding the plan including each of them. We will focus here on the first: the individual creating them.

As far as the individual creating them is concerned, the problem does not exist for legal codes: they are created by the Parliament, the authority able to enact laws. This contrasts with who is able to create codes of practice. The three following types of individual can be referred to here. The distinction depends on the individual creating them and the characteristics conferred on the rules by the function for which they are created by each individual or individuals.

Firstly, there are professional codes of conduct or deontological codes, which are the groups of systemized norms, approved by groups of professionals in order to self-regulate themselves, to provide rules for their everyday dealings. Some of the oldest professional codes include for example, those for doctors and lawyers. They also exist for more modern professions such as engineers, or even IT professionals.

Secondly, the term may refer to codes of conduct or practice drawn up to complete Laws approved by the Parliament. These codes describe legal texts and explain them. They make them clearer to those charged with implementing the laws: citizens, public-sector workers and judges. They are approved by the ministerial departments enabled by the law for their enactment. These codes are as a result equivalent to the Regulations in the Spanish legal code[66].

Thirdly, the term can refer to the phenomenon of de-regulation, occurring in our society when, as a consequence of the complexity of the characteristics, and the scarcity of regulatory proposals made in this regard by those charged with carrying out positivist legal studies of the laws, centred just on the consideration of method, self-regulation is entrusted with particular social areas, which is undertaken by experts in the specific field: technicians, especially those scientifically trained, employing their knowledge of the area. Codes of conduct are therefore groups of norms or guidelines for behaviour which, *drawn up by specialists (IT professionals) and users*, with a systematic and methodical plan, regulate the conduct of the creators and users of information and communication technologies as regards their use especially in the area of personal data processing.

A fourth possibility, a variant of the previous one, involves the self-regulation being undertaken by members of society, who are or are not familiar with the information and communications technologies, representatives of the social groups it is composed of. Clearly, members of the Parliament, but also members of unions, business organizations, companies and non-government organizations involved in this field. We should remember this is just the implementation of the principle of respect for IT self-determination, a principle in which citizens and groups making up the whole of society participate. In this case the reference is constituted by

66 This is a legal practice used extensively in the United Kingdom, probably due to the unwritten nature of their basic legal code or constitution, or the inexistence of legal codes, in contrast to what occurs in countries with continental legal systems.

proposals we made in section 4.3 above on the basic activities of IT professionals. We mentioned that these activities had characteristics conferred on them by the work of the IT professionals, the social needs (including guidelines of the specific institution) and their adaptation to what is laid down in laws, principles and guidelines specific to a democratic society.

In conclusion to this section, we should point out that in the Law for electronic government, art. 4, i), there is direct mention of these codes employing the term standards as part of the next general principle that has to be respected when putting this Administration into practice:

- Principle of technological neutrality and adaptability to the progress of the electronic communications techniques and systems by guaranteeing, through the use of open standards and internationally recognized standards, the independence of choice of the alternative technologies made by the citizens and the Public Administrations, as well as freedom to develop and implement technological advances in a free market environment.

4.7 Consent and the Activities of IT Professionals

Subsequent to the reflections made in this chapter, the following conclusions could be drawn as regards the activities of IT professionals related to Electronic Government taken as a reference to present legislation in the field:

- That the professional activities under study refer to technical and cultural knowledge;
- That they are limited by the characteristics of both types of knowledge, and;
- That they are legitimized by the consent of the citizens the laws apply to; the values or cultural ideals that guide the implementation not only of legal activities but also technical activities.

The particularities of the activities of IT professionals have been expressed by the fact that since the nineteen seventies laws have existed, which have regulated the formulation of the principles for the safeguarding of intimacy or IT self-determination at the same time as providing for the principles and rules governing their professional practices as regards security measures comprising data protection. They are also limited by the fact that society has different values, guidelines for action or moral criteria specifying their environment.

From the social point of view, the activities have tackled, to a greater or lesser extent, by virtue of the historical experience of the twentieth and twenty first centuries, social demands generally made of the professional activities and the areas of reflection undertaken in Philosophy, Theory and History of Science, Legal Philosophy, Political and Ethical Philosophy, basically over the last two centuries.

These activities are possible because any professional activity is characterised by the fulfilment of the most recent things of note arising from the reflection: they are general activities, very imprecise, subjected to rules and procedures that have to be accepted. They can therefore be described as 'typical' activities. From another point of view, of valuations, they can also be characterized as deliberations. This reflection links with the consideration in which legal activities have been held in general over the last two centuries, from the moment in which legal professionals have taken on the auxiliary role of interpreters of laws, which are created by parliamentary representatives. In the field of Information Technology, most of the activities of the engineers are deliberations for the reasons explained in the discussion on the description of the regulatory measures for the protection of data precisely by informed consent.

As a result of all the above, in addition to having technical characteristics, IT activities can be considered, as can any other professional activity, to be in the final analysis a political, communicative activity open to consent or acceptance. This is the case because in a democratic society, the State requires all activities undertaken by professionals with social repercussions, regardless of

their structural characteristics, to be legitimised, or in other words, to be susceptible to obtaining the consent or acceptance of the majority of individuals involved in them, as established by the regulations and essential principles of the current legal – democratic – systems, especially as regards the principle of self-determination. We must remember that in a Democratic State, there is an obligation to encourage legal activities, which require legal – textual – foundations, for all activities on all levels of authority: they must be based on appropriate general criteria, recognized or accepted by the majority. The same is true for IT activities in that social experiments can only be undertaken with the consent of the participants.

The activities are at the same time linked to justice[67]. This means the following.

The term *just* includes both those activities undertaken by applying democratic procedures established in the Democratic State directed by consensus, and those that arise from majority criteria for action, respecting minorities, expressed in their most plural and complex forms: legal regulations and principles, moral principles and social uses. Criteria that can be systematized with regard to philosophical categories or values (equality – justice –, freedom, legal and community security), fundamental legal concepts (legitimacy of state activities, contract, movement of goods and services, property, process and sentences)[68] and preferences or political conceptions (for example, those of efficiency, impartiality and communication, explained when discussing codes of practice, also; libertarian, socialist, social democrat, feminist and community)[69].

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67 It is important to reiterate the fact that appealing for justice is not recognition that all activities are just, but rather that only those are that appeal to 'the application of some conception of justice'. See: Brudney (1993), p. 300. In the work of Brudney the positions of Fuller, Hart and Soper on the concepts of Right are extended and criticized (Brudney, 1993, p. 280–98).

68 Zippelius (1994), p. 74–246.

69 Sterba (1988).

When consent in the field of information technology refers to the explicit acceptance by those involved of a specific application, made in the way prescribed by the security measures and the laws for the protection of data, it is also possible to advocate the IT activities that have generated the application of the description of 'just' by virtue of the effective degree of participation of those concerned. This means the description of 'just' can be advocated for these when they are undertaken in accordance with the security measures and contents of data protection laws. Measures and laws that can be included in codes of conduct.

These concepts also presuppose the following essential requirement: you can only refer to there being an IT application, in the field of Electronic Government too, when all those involved have really participated in the legal or IT activity. It is necessary to recognize that just activities only exist when everyone has at least had the opportunity to express their opinion on the matter. This makes any undemocratic legal or IT activity unjust, and of course includes all automatic 'activities'.

4.8 Summary

This Chapter provides the reasons for studying the regulations governing access to programmes and systems comprising Electronic Government, as described in the concise contents of the Law for electronic citizen access to Public Administrations, employing the characteristics of the professional activities of IT professionals, and the fact that these are regulated by criteria contained in legal texts, technical standards, codes of conduct and policies adopted by the competent institutions and organizations since the nineteen sixties, the contents of which are summarized in the description of general principles and rights of citizens in the Law. This follows a brief description of the development of the essential contents of the mechanisms safeguarding the security and justice of any information system that could be described as an IT application.

4.9 Activities

1. Find out which countries have legislation on Electronic Government and the contents that differentiate theirs from others.
2. Are the Administration Service Charters codes of conduct? Find some examples of Service Charters.
3. Consult the literature, legislation and information on Internet to establish the main milestones in ICT regulation.
4. Find codes of conduct for electronic commerce and administration/government on the Internet.

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APPENDIX
SURVEYS EVALUATING ELECTRONIC GOVERNMENT PORTALS

A.1 Evaluation of the Development of Electronic Government

Over recent years the information and communications technologies (ICT) have undergone a spectacular development with a positive effect, since society as a whole (citizens, governments and companies) has benefited from tools for the exchange of information in real time. This impact could however have a negative impact if it only reaches one section of society, resulting in what is known as the 'digital divide'.

In order to overcome these weaknesses, governments must be the main backers of the Information Society, to do everything possible to enable the introduction of the use of ICTs in the national, regional, local and supra-national activities of public administrations in order to increase the relations between citizens and companies and the administrations with a view to improving the efficiency of public services achieved by the use of ICTs.

In order to be effective in this sense, governments need to understand the real situation of the development of Electronic Government. Effective policies to integrate ICTs naturally into social processes can be implemented given the necessary information.

There are numerous European, national and regional initiatives proposed to evaluate the development of Electronic Government. In the framework of successive *eEurope* initiatives of the European Union, metrics of indicators have been set up for comparative evaluations so that all the Member States of the European Union can use the same metric in their local evaluations and are able to set up comparisons.

In 2001, the European Union adopted a group of twenty indicators for the comparative evaluation of electronic government in Europe; twelve indicators on public services for citizens:

1. taxes
2. employment searches
3. Social Security provisions
4. Obtainment of personal documents (such as driving licenses and passports)
5. car registration
6. requests for building permits
7. police declarations
8. access to public libraries
9. request and issue of certificates of a civil nature (birth, marriage)
10. University registration
11. changes of address
12. health services

And eight on public services for companies:

13. payment of Social Security instalments
14. payment of company taxes
15. payment of indirect taxation (VAT)
16. registration in the mercantile register
17. dispatch of statistical data

18. customs declarations
19. environmental permits
20. public sector tendering

This metric does not however enable the evaluation of services that do not fall into this list of twenty, and neither does it enable the general evaluation of a public administration Website.

A.2 LEFIS Metric

The objective of the metric described here is to evaluate the workings of the Electronic Government Web pages, and key elements of their political, legal and social environment.

It has 93 indicators organized in four parts with each of the parts divided into areas.

The four parts are organized from the point of view of processes and include information on:

- 0 Contextual indicators
- I Input indicators
- II Output indicators
- III Outcome indicators

The areas each of the parts are organized into are as follows:

- I Input indicators
  - I.1. Leadership
  - I.2. Policies
  - I.3. Alliances
  - I.4. Human resources
  - I.5. Economic resources
  - I.6. Development policies
- II Output indicators
  - II.1. Number of services
  - II.2. Level of the services in critical processes
  - II.3. Integration
  - II.4. Navigability

II.5. Searchability (internal)
II.6. Searchability (external)
II.7. Accessibility with special needs
II.8. Up-to-dateness
II.9. Responsibility
II.10. Linguistic accessibility
II.11. Interoperability
II.12. Size
II.13. Use of multimedia resources
II.14. Availability
II.15. Feedback and quality policies

III Outcome indicators
III.1. Use of the services
III.2. User satisfaction with the services

The data used to evaluate the indicators must be obtained from four different sources using the corresponding tools:

1. Statistical databases.
2. Bibliographic catalogues.
3. Observation and analysis of Electronic Government portals.
4. Interviews with informed persons and those responsible for the portals.

For this reason, each indicator type has been broken down into a different questionnaire in accordance with the source of the data employed in the evaluation, so as to optimize time spent by the evaluators.

The four questionnaires are as follows:

Phase 0: Data searched for in the Statistics Institutes of the countries corresponding to the Websites being evaluated.
Phase I: Data searched for in documentary databases, search engines, listings, etc.
Phase II: Analysis of the Website under study.
Phase III: Interviews with people from the organization responsible for the Website under study or other authorized personnel.

A.3 Questionnaires of the LEFIS Metric

Phase 0: Contextual Indicators

Indicator 0.1: Percentage of homes with access to Internet Question: What percentage of homes have access to Internet? Sources: National Statistics Institute Response: 0–100
Indicator 0.2: Percentage of companies with access to Internet Question: What percentage of companies have access to Internet? Sources: National Statistics Institute Response: 0–100
Indicator 0.3: Percentage of individuals using Internet at least once a week. Question: What is the percentage of individuals using Internet at least once a week? Sources: National Statistics Institute Response: 0–100
Indicator 0.4: Percentage of homes with broad band connection Question: What is the percentage of homes with broad band connection? Sources: National Statistics Institute Response: 0–100
Indicator 0.5: Percentage of companies with broad band connection Question: What is the percentage of companies with broad band connection? Sources: National Statistics Institute Response: 0–100
Indicator 0.6: Percentage of individuals purchasing online in the last three months Question: What is the percentage of individuals purchasing online in the last three months? Sources: National Statistics Institute Response: 0–100

Indicator 0.7: Percentage of companies receiving online orders in the last year Question: What is the percentage of companies receiving online orders in the last year? Sources: National Statistics Institute Response: 0–100
Indicator 0.8: Percentage of individuals using Internet to interact with the public authorities to obtain information Question: What is the percentage of individuals using Internet to interact with the public authorities to obtain information? Sources: National Statistics Institute Response: 0–100
Indicator 0.9: Percentage of individuals using Internet to interact with the public authorities to download forms Question: What is the percentage of individuals using Internet to interact with the public authorities to download forms? Sources: National Statistics Institute Response: 0–100
Indicator 0.10: Percentage of individuals using Internet to interact with the public authorities to send completed forms Question: What is the percentage of individuals using Internet to interact with the public authorities to send completed forms? Sources: National Statistics Institute Response: 0–100
Indicator 0.11: Percentage of companies using Internet to interact with the public authorities to obtain information Question: What is the percentage of companies using Internet to interact with the public authorities to obtain information? Sources: National Statistics Institute Response: 0–100

Indicator 0.12: Percentage of companies using Internet to interact with the public authorities to download forms Question: What is the percentage of companies using Internet to interact with the public authorities to download forms? Sources: National Statistics Institute Response: 0–100
Indicator 0.13: Percentage of companies using Internet to interact with the public authorities to send completed forms Question: What is the percentage of companies using Internet to interact with the public authorities to send completed forms? Sources: National Statistics Institute Response: 0–100

Phase I: Search for Data in Documentary Databases, Search Engines, Listings, etc.

I. Input indicators
I.2 Area: Policy
Indicator I.2.2: Existence of specific legislation on Electronic Government: Number of items Question: How many national or regional laws exist to regulate the Electronic Government? Sources: Official Bulletins, Legislation databases Response: 0,1,2,… Comments: List of existing laws and specific articles, attach copy
Indicator I.2.3: Existence of specific standards on Electronic Government: Number of items Question: How many national, regional, or local regulatory standards exist for the regulation of the Electronic Government? Sources: Official Bulletins, Legislation databases Response: 0,1,2,… Comments: List of existing standards and specific articles, attach copy
Indicator I.2.4: Reference to Electronic Government in the legislation or regulations on other matters: Number of items Question: How many laws or regulations of a national, regional, or local nature exist on other matters but refer to Electronic Government? Sources: Official Bulletins, legislation databases, director of the organization or authorized person Response: 0,1,2,… Comments: List of existing regulations and specific articles, attach copy

Indicator I.2.5: Number of legal sentences on Electronic Government Question: How many legal sentences exist on Electronic Government? Sources: Official Bulletins, jurisprudence databases Response: 0,1,2,… Comments: List of the regulations, sentences, attach copy
Indicator I.2.6: Number of interventions in government collegial organizations in Electronic Government Question: How many interventions in government collegial organizations exist in Electronic Government? Sources: Documents of collegial organizations, director of the organization or authorized person Response: 0,1,2,… Comments: List of interventions, attach copy

II. Output indicators
II.6 Area: Searchability (external)
Indicator II.6.1: Position of the service in the general and specialized search engines of relevance to the country, institution and service Question: In what position does the service appear in the relevant search engines? Sources: Search engines Response: 5 = in first place, 4 = in the first half of the first page of results, 3 = in the second half of the first page, 2 = on the second page, 1 = on the third page, 0 = does not appear on the first three pages Comments: Test at least Google. List the search engines used and the position obtained in each of them

Indicator II.6.2: Presence in the main listings of Electronic Government services in the country and its supra-national area
Question: Does the service appear in the main listings of Electronic Government services in the country and its supra-national area?
Sources: Listings of Electronic Government services
Response: Yes/No
Comments: A list of the listings in which it appears

Phase II: Analysis of the Web under Evaluation

I. Input indicators
I.1 Area: Leadership
Indicator I.1.1: Existence of a strategic plan for Electronic Government Question: Is there a strategic plan for Electronic Government? Sources: Director of the organization or authorized person, if the information is not available on the Web page Response: Yes/No Comments: 1. Name of the document, date, version, attach copy (if possible) 2. In the event of the existence of a document containing specific lines of action for the Electronic Government, even if it not formally labelled a strategic plan, it will be considered as such for the purposes of this question
Indicator I.1.2: Existence of specific lines for Electronic Government in the general plan of the organization Question: Is there a general strategic plan, which includes specific lines for Electronic Government? Sources: Director of the organization or authorized person, if the information is not available on the Web page Response: Yes/No Comments: 1. Name of the document, date, version attach copy (if possible) 2. In the event of the existence of a document containing specific lines of action for the Electronic Government, even if it not formally labelled a strategic plan, it will be considered as such for the purposes of this question

II. Output indicators
II.1 Area: Number of services
Indicator II.1.1: Number of services available by areas of government Question: How many services are available online by government areas? Sources: Web being evaluated Response: N1,N2,…,N12 = 0,1,2,… (one value for each area of government) Comments: Areas of government: Foreign relations, Taxation, Economic affairs, Public infrastructures, Transport, Telecommunications, Education, Culture, Social security, Health, Consumption, Security
Indicator II.1.2: Number of services by administrative level
Question: How many services are available online by administrative level? Sources: Web being evaluated Response: N1,N2,N3,N4,N5,N6 = 0,1,2,… (One level for each administrative level) Comments: Administrative levels: Local, Regional, Autonomous, Federal, State, Supra-national

Indicator II.1.3: Number of services by type of relation between actors Question: How many services are available online by type of relation between actors? Sources: Web being evaluated Response: N1,N2,N3,N4,N5,N6 = 0,1,2,… (One level for each administrative level) Comments: Types of relation between actors: Citizen to citizen (C2C), Administration to administration (A2A), Administration to citizen (A2C), Citizen to administration (C26), Administration to companies (G2B), Companies to administration (B2G)

II.2 Area: Level of service in critical processes (procedures)
Indicator II.2.1: Prior information Question: How can users obtain prior information? Sources: Web being evaluated Response: 0 = information is not on offer, 1 = general information is provided on the web, 2 = the users can request information to be received by regular mail, 3 = the users can request information to be received by electronic mail, 4 = the users can request information, which is displayed online
Indicator II.2.2: Forms Question: How can the users obtain and send forms? Sources: Web being evaluated Response: 0 = there are no forms, 1 = the users can obtain forms and complete them offline, 2 = the users can obtain forms, complete them offline and send them by email, 3 = the users can obtain forms, and send them online Comments: Attach copy of the forms
Indicator II.2.3: Payment of fees Question: How can the users make the payment of fees? Sources: Web being evaluated Response: 0 = Fees are not paid, 1 = the users can pay fees offline, 2 = the users can pay fees online with credit cards, 3 = the users can pay fees online by electronic payment Comments: Attach information on fees
Indicator II.2.4: Subsequent information Question: How can the users obtain information after initiating procedures? Sources: Web being evaluated Response: 0 = results cannot be obtained, 1 = the users can obtain the results offline (by regular mail, etc.), 2 = the users can obtain the results by email, 3 = the users can obtain the results online Comments: Attach information on the communications that can be obtained

II.3 Area: Integration
Indicator II.3.1: The services are integrated in a portal (measured on an inverse scale according to the number of different portals) Question: Are the services of the organization integrated into a single portal? Sources: Web being evaluated Response: 1/N where N is the number of different portals for online services provided by the organization Comments: List the portals and the units responsible for each of them

II.4 Area: Navigability
Indicator II.4.1: The service is easy to navigate Question: Is the service easy to navigate? Sources: Web being evaluated Response: Value from 0 (very difficult navigation) to 5 (very easy to navigate)
Indicator II.4.2: The general navigation menus are always available Question: Are the general navigation menus always available? Sources: Web being evaluated Response: Value from 0 (hardly available) to 5 (highly available)
Indicator II.4.3: The terminology of the menus is consistent Question: Are the same sections and concepts expressed with the same terms in the whole Web? Sources: Web being evaluated Response: Value from 0 (very inconsistent) to 5 (completely consistent) Comments: Indicate the inconsistencies detected

Indicator II.4.4: The terminology of the menus is not ambiguous Question: Can the terms of the menus be understood in two or more different ways? Sources: Web being evaluated Response: Value from 0 (very ambiguous) to 5 (not at all ambiguous) Comments: Indicate the ambiguities detected
Indicator II.4.5: Access can by gained by user profile Question: Can access be gained by user profile? Sources: Web being evaluated Response: Yes/No Comments: Indicate the profiles used to gain access
Indicator II.4.6: The Web services are organized in a clear and intuitive way for citizens Question: Are the Web services organized in a clear and intuitive way for citizens, for example in accordance with the life cycle? Sources: Web being evaluated Response: Value from 0 (not organized) to 5 (completely organized) Comments: Describe the criteria used to organize the services

Indicator II.4.7: There is a systematic listing of the topics of the service Question: Is there a systematic listing of the topics of the service? Sources: Web being evaluated Response: Value from 0 (there is no map of the textual Web) to 5 (it is very accurate) Comments: Indicate the level of detail of the listing. Attach listing
Indicator II.4.8: There is a complete graphical map of the service Question: Is there a complete graphical map of the service? Sources: Web being evaluated Response: Value from 0 (there is no map) to 5 (it is very accurate) Comments: Indicate the level of detail of the map. Attach map

Indicator II.4.9: There is an alphabetical listing of the topics of the service Question: There is an alphabetical listing of the topics of the service? Sources: Web being evaluated Response: Value from 0 (there is no listing) to 5 (it is very accurate) Comments: Indicate the level of detail of the listing. Attach listing

II.5 Area: Searchability (internal)
Indicator II.5.1: The service has a search engine Question: Is there a search engine for the service? Sources: Web being evaluated Response: Yes/No Comments: Describe the type of search engine
Indicator II.5.2: The search engine enables searches for chains of more than one word Question: Can searches be made for chains of more than one word using the search engine? Sources: Web being evaluated Response: Yes/No/NA (NA if the service has no search engine)
Indicator II.5.3: The search engine has logical operators Question: Does the search engine have logical operators (yes or no)? Sources: Web being evaluated Response: Yes/No/NA (NA if the service does not have a search engine) Comments: if the service does not have a search engine, respond NA
Indicator II.5.4: The search engine has comparison operators Question: Does the search engine have comparison operators (greater than, less than,…)? Sources: Web being evaluated Response: Yes/No/NA (NA if the service does not have a search engine)

Indicator II.5.5: The search engine has truncation operators Question: Does the search engine have truncation operators? Sources: Web being evaluated Response: Yes/No/NA (NA if the service does not have a search engine)

Indicator II.5.6: The search engine has proximity operators Question: Does the search engine have proximity operators? Sources: Web being evaluated Response: Yes/No/NA (NA if the service does not have a search engine)
Indicator II.5.7: The search engine has a thesaurus Question: Does the search engine have a thesaurus? Sources: Web being evaluated Response: Yes/No/NA(NA if the service does not have a search engine)
Indicator II.5.8: The operators are available in a simplified manner Question: Are the operators available in a simplified manner? Sources: Web being evaluated Response: Value from 0 (not at all simplified) to 5 (completely simplified) (NA if the service does not have a search engine)

II.7 Area: Special needs
Indicator II.7.1: The WAI recommendation is followed Question: Does the Web page follow the WAI recommendation? Sources: Web being evaluated Response: Yes/No Comments: Web Accessibility Initiative (WAI): http://www.w3.org/WAI

II.8 Area: Up-to-dateness
Indicator II.8.1: The pages show a creation date Question: Can a creation date be read on the page? Sources: Web being evaluated Response: Yes/No
Indicator II.8.2: The pages provide the date of the last modification Question: Can the date of the last modification be read on the page? Sources: Web being evaluated Response: Yes/No
Indicator II.8.3: The information is up-to-date (on a scale of 24 months) Question: Is the information up to date? Sources: Web being evaluated Response: 0: older than 24 months, 1: one year, 2: six months, 3: one month, 4: one week, 5: the same day

II.9 Area: Responsibility
Indicator II.9.1: All the pages are identified with the institution and department responsible Question: Are all the pages identified with the institution and department responsible? Sources: Web being evaluated Response: Yes/No
Indicator II.9.2: All the pages provide contact information or can be sent to Question: Do all the pages provide contact information or can be sent to? Sources: Web being evaluated Response: Yes/No

II.10 Area: Linguistic accessibility
Indicator II.10.1: All the pages are available in the corresponding official languages Question: Are all the pages available in the official languages of the territorial domain of the organization? Sources: Web being evaluated Response: Yes/No
Indicator II.10.2: All the pages are available in the language of the users Question: Are all the pages available in the languages of the users? Sources: Web being evaluated Response: Yes/No
Indicator II.10.3: All the pages are available in at least one international language Question: Are all the pages available in English? Sources: Web being evaluated Response: Yes/No
Indicator II.10.4: All the pages are available in other international languages Question: Are all the pages available in other international languages? Sources: Web being evaluated Response: Yes/No

II.11 Area: Interoperability
Indicator II.11.1: The system is available for the main browsers and their most commonly used versions Question: Is the system available for the main browsers and their most commonly used versions? Sources: Web being evaluated Response: D1 (Internet Explorer from Windows) = Yes/No, D2 (Netscape from Windows) = Yes/No, D3 (Mozilla from Windows) = Yes/No, D4 (Safari from Mac OS X) = Yes/No, D5 (Internet Explorer from Mac OS X) = Yes/No, D6 (Netscape from Mac OS X) = Yes/No, D7 (Mozilla from Mac OS X) = Yes/No D8 (Netscape from Linux) = Yes/No, D9 (Mozilla from Linux) = Yes/No, D10 (Others, indicate) = Yes/No

II.13 Area: Use of multimedia
Indicator II.13.1: Internal links by page Question: How many links occur from one page to another within the same service? Sources: Web being evaluated Response: 0,1,2,… Comments: Calculate the average number of links on the main page and those on the first level
Indicator II.13.2: External links per page Question: How many links occur from one page to others external to the service? Sources: Web being evaluated Response: 0,1,2,… Comments: Calculate the average number of links on the main page and on those on the first level

Indicator II.13.3: Use of image files Question: How many image files are used in the service? Sources: Web being evaluated Response: 0,1,2,… Comments: Calculate the average number of image files used on the main page and on those of the first level
Indicator II.13.4: Use of video files Question: How many video files are used on the service? Sources: Web being evaluated Response: 0,1,2,… Comments: Calculate the average number of video files used on the main page and on those of the first level
Indicator II.13.5: Use of audio files Question: How many audio files are used in the service? Sources: Web being evaluated Response: 0,1,2,… Comments: Calculate the average number of audio files used on the main page and those of the first level
Indicator II.13.6: Design quality Question: What is the design quality of the page? Sources: Web being evaluated Response: 0 (no quality)–5(maximum quality) Comments: Reason for valuation

II.14 Area: Availability
Indicator II.14.2: Number of incorrect links
Question: How many incorrect links are there on the main page and those of the first level?
Sources: Web being evaluated
Response: 0,1,2,…

II.15 Area: Feedback and quality policy
Indicator II.15.1: There is a service charter Question: Is there a service charter? Sources: Web being evaluated Response: Yes/No Comments: Attach copy of the service charter
Indicator II.15.2: There is a suggestion, complaint or query box Question: Is there a suggestion, complaint or query box? Sources: Web being evaluated Response: Yes/No
Indicator II.15.4: Users are provided with a satisfaction questionnaire Question: Are users provided with satisfaction questionnaires? Sources: Web being evaluated Response: Yes/No Comments: Attach copy of the questionnaire

Phase III: Interview with the Director of the Organization or Authorized Person

I. Input indicators
I.1 Area: Leadership
Indicator I.1.1: Existence of a strategic plan on Electronic Government Question: Is there a strategic plan for Electronic Government? Sources: Director of the organization or authorized person Response: Yes/No Comments: Attach name of the document, date, version, attach copy If there is a document with specific lines of action for Electronic Government, which is not formally a strategic plan, it will be considered as such for the purposes of this question
Indicator I.1.2: Existence of specific lines for Electronic Government in the general strategic plan of the organization Question: Is there a general strategic plan that includes specific lines on Electronic Government? Sources: Director of the organization or authorized person Response: Yes/No Comments: Attach name of the document, date, version, attach copy If there is a document with specific lines of action for Electronic Government, which is not formally a strategic plan, it will be considered as such for the purposes of this question

I.2 Area: Policy
Indicator I.2.1: There are specific policy documents: Number of items Question: How many national, autonomic, regional or local policy documents are there relating to Electronic Government? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Policy documents are understood to include White Papers, studies and reports, for example Action Plan eEurope 2010
Indicator I.2.4: References to Electronic Government in the legislation or regulations for other matters: Number of items Question: How may national, autonomic, regional or local laws or regulations are there for other areas that refer to Electronic Government? Sources: Official Bulletins, Legislation databases, director of the organization or authorized person Response: 0,1,2,… Comments: Attach list of existing regulations and specific articles, attach copy
Indicator I.2.6: Number of interventions of the organization in government collegial bodies on Electronic Government: Number of items Question: How many interventions are there in government collegial bodies concerning Electronic Government? Sources: Minutes of collegial bodies, director of the organization or authorized person Response: 0,1,2,… Comments: Attach list of interventions, attach copy

I.3 Area: Alliances
Indicator I.3.1: Number of members in national and international organizations and committees related to Electronic Government Question: How many members are there of the organization or who have participated in national and international bodies and committees related to electronic organization? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Note down who, their post, start date and end date
Indicator I.3.2: Number of projects with other governmental bodies Question: How many projects has the organization maintained or does the organization maintain with other government bodies related to Electronic Government? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Note down the title of the project, director of the project, participating bodies, financing, start date, end date
Indicator I.3.3: Number of projects with private partners Question: How many projects has the organization maintained or does the organization maintain with private partners? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Note down the title of the project, director of the project, participating bodies, financing, start date, end date
Indicator I.3.4: Number of projects with non-government organizations Question: How many projects has the organization maintained or does the organization maintain with non-government organizations? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Note down the title of the project, director of the project, participating bodies, financing, start date, end date

I.4 Area: People
Indicator I.4.1: Number of public-sector workers involved in Electronic Government projects Question: How many public-sector workers are or have been involved in Electronic Government projects? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Note down, who, post, where, start date, end date
Indicator I.4.2: Percentage of public-sector workers involved in Electronic Government projects Question: How many public-sector workers are there in the organization? Sources: Director of the organization or authorized person Response: 0-100 Comments: As the value of the Indicator, calculate the percentage: Number of public-sector workers*100/I.4.1; attach scale of levels for public-sector workers
Indicator I.4.3: Qualifications of the public-sector workers involved in Electronic Government projects Question: What is the qualification of public-sector workers involved in Electronic Government projects? Sources: Director of the organization or authorized person Response: N1, N2, N3, N4, N5, N6, N7, N8; each with a value 0,1,2,… N1 = number of Doctors; N2 = number of higher graduates; N3 = number of lower graduates; N4 = number professionally trained; N5 = number of high school graduates; N6 = number completing compulsory high school; N7 = number completing primary education Comments: Note down who, qualification

Indicator I.4.4: Administrative level of public-sector workers involved in Electronic Government projects
Question: What is the administrative level of public-sector workers involved in Electronic Government projects?
Sources: Director of the organization or authorized person
Response: N1, N2, N3, N4,… (as many as there are levels); each with a value 0,1,2,…
Ni is the number of public-sector workers on level i
Comments: Note down who, administrative level

Indicator I.4.5: Number of external personnel involved in Electronic Government projects
Question: How many people from other companies or external organizations are involved in Electronic Government projects of the organization or in the part corresponding to the organization in projects shared with other organizations?
Sources: Director of the organization or authorized person
Response: 0,1,2,…
Comments: Note down who, company or external organization

Indicator I.4.6: Qualification of the external personnel involved in Electronic Government projects
Question: What is the qualification of the external personnel involved in the Electronic Government projects?
Sources: Director of the organization or authorized person
Response: N1, N2, N3, N4, N5, N6, N7, N8; each with a value 0,1,2,…
N1 = number of Doctors; N2 = number of higher graduates; N3 = number of lower graduates; N4 = number professionally trained; N5 = number of high school graduates; N6 = number completing compulsory high school; N7 = number completing primary education
Comments: Note down who, qualification

Indicator I.4.7: Units of the organization involved in Electronic Government projects Question: How many units of the organization are involved in Electronic Government projects? Sources: Director of the organization or authorized person Response: 0,1,2,… Comments: Note down units

I.5 Area: Financial resources
Indicator I.5.1: Total amount in euros of budget items providing for Electronic Government projects Question: What is the total amount in euros or dollars of budget items providing for Electronic Government projects? Sources: Director of the organization or authorized person Response: ≥0 Comments: Link the items and the amounts
Indicator I.5.2: Total amount in euros spent on Electronic Government projects Question: What is the total amount in euros or dollars spent on Electronic Government projects? Sources: Director of the organization or authorized person Response: ≥0 Comments: Link the items and the amounts

I.6 Area: Application development policies
Indicator I.6.1: Meeting the standards for data protection Question: Are data protection standards met? Sources: Director of the organization or authorized person Response: Yes/No Comments: Note down the reference to the current standard for the protection of data, attach copy

Indicator I.6.2: Meeting standards for IT security Question: Are regulations and standards for IT security met? Sources: Director of the organization or authorized person Response: Yes/No Comments: Note down the reference to the security standard in force, attach copy. There will be countries in which there is no legislation but there are industrial standards
Indicator I.6.3: Meeting standards for interoperability and open systems Question: Are standards for interoperability and open systems met? Sources: Director of the organization or authorized person Response: Yes/No Comments: Note down the reference of the standards in force for interoperability and open systems, attach copy
Indicator I.6.4: Rules for the solution of conflicts Question: Are there rules for the solution of conflicts? Sources: Director of the organization or authorized person Response: Yes/No Comments: Note down the reference of the regulations for the solution of conflicts, attach copy

II. Output indicators
II.14 Area: Availability
Indicator II.14.1: Availability by year Question: How many hours was the service not working during the last year? Sources: Director of the organization or authorized person Response: 0–100 Comments: Calculate $\frac{(365\times24-H)\times100}{365\times24}$ where H is the number of hours downtime in the year

II.15 Area: Feedback and quality policy
Indicator II.15.3: Response time for the questions Question: How long does the service take to respond to users? Sources: Director of the organization or authorized person Response: 0: it does not respond; 1: 3 months; 2: 1 month; 3: 1 week; 4: 48 hours; 5: 24 hours Comments: Justify application of a different measure to the one above, depending on type of procedures

III. Outcome indicators
III.1 Area: Use of the services
Indicator III.1.1: Number of sessions per year Question: How many sessions did the service support in the last 12 months? Sources: Director of the organization or authorized person Response: 0,1,2,…
Indicator III.1.2: Percentage of citizens using the service online out of those using the service (by areas of government, administrative levels and relationship types). Question: What percentage of citizens using the service use it online? Sources: Director of the organization or authorized person Response: 0–100

III.2 Area: User satisfaction with the service
Indicator III.2.1: Percentage of satisfactory sessions per year Question: What percentage of sessions carried out in the last 12 months were satisfactory? Sources: Director of the organization or authorized person Response: 0–100

A.4 How the LEFIS Metric is Applied

To apply the LEFIS metric the following steps must be taken:

1. Ascertain the URLs of the Websites to be evaluated.
2. Read the questions from the four questionnaires described above carefully.
3. Explore the Websites being evaluated with regard to the questions asked in the four questionnaires.
4. The four questionnaires must be completed for each of the Websites under evaluation. In other words, a group of four questionnaires for each Website.
5. The information source of each questionnaire is different, which should be taken into account for their completion.
6. When a question is not applicable to the Web page being evaluated, indicate this with the response NA.
7. Those comments considered appropriate should be made in the corresponding section.

GLOSSARY

ARPANET (*Advanced Research Projects Agency Network)*: Computer network set up by the United States Defence Department. It is the origin of today's Internet.

B2B (Business to Business): Relations between companies based on the ICTs in order to carry out any kind of business.

B2C (Business to Consumer): Relations between companies and their clients based on ICTs.

B2E (Business to Employee): Relations between companies and their employees based on ICTs.

B2G (Business to Government): Relations between companies and public administrations based on ICTs.

Browser: Programme installed in a computer so users can retrieve and view documents available on Web servers.

C2C (Consumer to Consumer): Private relations for the exchange of goods and services between consumers based on the ICTs. The most common are those made using auction portals such as *ebay*.

Digital divide: Gap between people with access to Internet, who have access to a wealth of information, and those without access to Internet, who lack access to information. The digital divide may exist because of the differing skills of people, their education levels, and the existence and availability of infrastructures.

DNS (Domain Name System): Database distributed across the world that stores information on the domain names used on Internet, especially the association between the domain name and an IP address.

e-accesibility or electronic accessibility: A movement the goal of which is to increase accessibility to ICTs for the disabled and the elderly.

e-biz: abbreviation of *e-business*.

e-business or electronic business: The integration of systems, processes, organizations, value chains and markets in commercial relations using ICTs.

e-commerce or electronic commerce: Part of e-business concerned with the agreements and obligations of commercial relationships.

e-culture or electronic culture: A movement to increase accessibility for all citizens to culture using ICTs. It includes a range of activities, such as the development of online encyclopaedias, virtual visits to museums, or online transmission of cultural events.

e-democracy: Processes and structures that surround all forms of communication between citizens and the public administration based on ICTs.

e-democracy: Way in which the Administration uses ICTs to provide citizens with easier access to information and increased opportunities to participate in the institutions and democratic processes.

e-Europe: Generic name for successive initiatives of the European Union to turn Europe into a pioneer in the development of the Information Society.

e-governance: Collection of standards, processes and behaviours that have an impact on the exercise of power, especially from the point of view of openness, participation, responsibility, effectiveness and consistency.

e-government: Integrated supply of information and services made by the central, regional and local administrations of the legislative, executive and legal powers to citizens, companies and other public administrations based on ICTs.

e-health or electronic health: Services linked to health based on ICTs. It includes medical attention, consultancy, dossier processing and access to information.

e-inclusion or electronic inclusion: A movement the goal of which is to eliminate the digital divide. In other words to bring the «disenfranchised" on board, for example the poor, the unemployed, the disabled, etc. who do not have the possibility of accessing ICTs in the same way as the rest of the population.

e-learning or electronic learning: The use of new technologies in teaching so as to provide students with learning tools on the Internet, without time or geographical limits.

e-mail or electronic mail: One of the services available on Internet, which alongside the Web, is the most used. It enables personal communication between all the users of the network by means of the dispatch of text messages and files of any type in attachments to messages.

e-procurement: Process of acquiring goods and services made by a company or public administration using ICTs.

e-signature or digital or electronic signature: Signature mechanism based on cryptographic techniques that enable an individual to sign electronic documents.

G2B (Government to Business): Relations between a public administration and the private sector based on ICTs for the procurement of goods and service by the administration.

G2C (Government to Citizen): Relations between a public administration and citizens based on ICTs in order to provide citizens with permanent online access to administrative information and services and to citizen participation channels.

G2E (Government to Employee): Relations between a public administration and its workers based on ICTs.

G2G (Government to Government): Relations between public administrations based on ICTs.

Globalization: Process of increasing commercial relations and cultural exchange between all the countries of the world. The Merriam-Webster dictionary defines it as: *the development of an increasingly integrated global economy marked especially by free trade, free flow of*

capital, and the tapping of cheaper foreign labour markets, which shows that for some, globalization is a purely economic phenomenon.

HTML (Hypertext Mark-up Language): Standard language used to write Web pages.

HTTP (Hypertext Transport Protocol): Standard protocol setting up the rules for how Web pages are sent and received on the Internet.

Hyperlink: Link from data on a Web page to other data on the same page, on another Web page, another file, another computer or another programme.

Hypertext: A database format in which information related to that on a display can be accessed directly from the display (Merriam-Webster dictionary).

ICT (Information and Communications Technologies): Such as Internet, extranet, intranet, email, wireless communication, mobile telephony, etc.

Information society: Name for the society in which the creation, distribution and manipulation of information has become the most important economic and cultural activity and in which the main tools are computers and telecommunications.

Internet: Worldwide network of computers with the same communication standard: The TCP/IP protocol.

IP address: A number identifying a computer connected to Internet. Every computer connected to Internet at any moment in time has an associated IP address, which distinguishes it from others.

LAN (Local Area Network): Network connecting computers over sufficiently small distances to allow for the transmission of information between them digitally.

Modem: Acronym of Modulator/Demodulator. A device connected to a computer that enables it to communicate with others over the telephone line.

P2P (Peer to Peer): Relations between equals so they can make exchanges using ICTs. The best known are based on portals for the exchange of music files or programmes, such as *eMule*.

Search engine: Web page employed by users as a tool to search for resources on Internet. Some search engines limit their searches to the Web, while others search the entire Internet. There are search engines that only search for documents, while others search for all types of resources. There are search engines that enable the user to enter key words for the searches, while others provide thematic classifications to limit searches.

TCP/IP: Combination of two protocols (TCP=Transfer Control Protocol and IP=Internet Protocol), which set out the rules for how information can be sent and received on the Internet.

URL (Uniform Resource Locator): A chain of characters that adapts to a standard format and serves to locate resources on Internet.

World Wide Web: Hypertext system for sharing information based on Internet.