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Annex B - Reference Documentation.

A1 Detailed Analysis of the Priorities' identification process

The role and the significance of priorities in the matrix designed for assessing the ICT capabilities of local governments

In this Annex, there is a detailed description of the priorities identified in the Self- evaluation tool. These priorities described in the following paragraphs are examined in order to implement the General DLA. To see the document of the methodology, please refer to *DLA_General_Format.doc*

1. Office computerization

'Office computerization' as a priority is only the initial condition of taking steps leading towards the information society, which seems to be necessary for improving access of citizens and businesses to documents of public interest, allowing simple use of basic services by providing the accessibility of electronic administration processes. One of the essential internal conditions of making administrative services easier and simplifying the implementation of electronic administration is reaching the appropriate level of office computerization as well as the availability of adequate data bases, which simply means the continuous upgrade of the IT devices and applications used in the offices of local governments.

By definition, electronic administration is the management of municipal affairs by electronic means, which includes the handling of both incoming and outgoing information with a special attention to their formal and content aspects. This can be characterized by a number of work processes that are built upon each-other. It should be emphasized, however, that electronic administration does not solely depend on creating the appropriate IT background, providing further conditions is needed to its effective realization (the additional conditions may also appear as priorities):

- Establishing the legal environment for electronic administration (the law has to be formulated in a way that it should make the use of electronic administration possible in any given case, in other words, it should prevent local governments from excluding the possible use of electronic administration in their decrees. For instance, the possibility of issuing death certificates electronically is allowed by law in general terms but it is

to no purpose if there is another law or decree that allows local governments to exclude the possibility of electronic administration or to seclude themselves from it.)

- A thorough assessment of what local government activities and services can be performed or provided by using ICT devices, or rather what devices can be used for fulfilling this purpose.

1.1. Municipal activities

In order to understand the significance of electronic administration in the daily activities performed by local governments, it is well worth taking a look at their major responsibilities. These can be classified into two main groups:

1.1.1. *Obligatory functions of local governments **as** required by law*

A) Local government responsibilities:

- A healthy supply of drinking water;
- Providing pre-primary education;
- Providing primary education;
- Health and basic social services;
- Public lighting;
- Maintaining local roads and public cemeteries;
- Ensuring the enforcement of law for national and ethnic minorities;
- Providing firefighting and protection;
- Providing public security services.

B) Performing centrally determined administrative tasks, providing administrative services:

It is not uniformly determined that what central administrative tasks have to be performed by local governments. In terms of building electronic infrastructure, the most frequently used administrative services prove to be significant. The Member States of the European Union have agreed to endorse a common list of electronically available 20 basic public services (Common List of Basic Public Services for Citizens and Businesses), 12 for citizens (G2C, Government-to-Citizen) and 8 for businesses (G2B, Government-to-Business).

In the following list, the most frequently used local public administration tasks are highlighted in bold letters:

Public Services for Citizens:

1. Income taxes: declaration, notification of assessment;
2. Job search services by labour offices;

3. Social security contributions (3 out of the following 4):
 - Unemployment benefits,
 - Child allowances,
 - Medical costs (reimbursement or direct settlement),
 - Student grants.
- 4. Personal documents (passport, ID cards and driver's licence);**
5. Car registration (new, used and imported cars);
- 6. Application for building permission;**
7. Declaration to the police (e.g. in case of theft);
8. Public libraries (availability of catalogues, search tools);
- 9. Certificates (birth, marriage): request and delivery;**
10. Enrolment in higher education / university;
- 11. Announcement of moving (change of address);**
12. Health related services (e.g. interactive advice on the availability of services in different hospitals; appointments for hospitals).

Public Services for Businesses:

1. Social contribution for employees;
2. Corporation tax: declaration, notification;
3. VAT: declaration, notification;
4. Registration of a new company;
5. Submission of data to statistical offices;
6. Customs declarations;
7. Environment-related permits (incl. reporting);
8. Public procurement.

1.1.2. Local public affairs

Local public affairs include providing the resident population with public services, exercising public authority involving local government bodies, committees and representatives, and last but not least, creating organizational, personal and financial conditions needed to perform the aforementioned tasks. Local administrative cases also belong to local public affairs in which decisions must be made by applying the rules of public administration procedures. This is the case, for instance, when a local government gives restaurants or pubs permission to use an area that was defined as public space earlier. Establishing terraces in front of the entrance of such catering places must be done by obliging to the rules of public administration procedures.

As a summary, local governments need to focus on the following three scopes of activities when they are about to design and implement their own DLA plan:

- Performing centrally determined administrative tasks, providing administrative services;
- Exercising public authority involving local government bodies, committees and representatives;
- Dealing with local administrative matters.

1.2. External and internal work processes at local governments

Within the offices of local governments, electronic administration can be broken up into two types of applications:

- Front office applications;
- Back office applications

1.2.1 Front office applications

The so-called front office functions are responsible for delivering and transmitting information to citizens as well as maintaining contact with clients. In other words, front office can be considered the external part of electronic administration. In the structure of front office applications, four distinctive development stages may be observed:

- Access,
- Interaction,
- Transaction,
- Integration.

Access level means that local governments provide one-way communication by maintaining static web pages in a way very similar to that of paper brochures.

The *level of interaction* refers to more content than it is in the case of pure access. At this level, businesses and citizens can have access to certain databases (legal archives, licensed business records and documents etc.) through various applications, furthermore, they are allowed to download various documents and forms, use search engines and ask questions by sending electronic mails.

At the *level of transaction*, users are given the option of making financial transactions such as paying duties, administrative service fees and local taxes electronically without having to appear in person. After logging on to a central server, clients are given a multi-digit identification number and get their account number as well. When the transfer of the desired amount of money is completed - which is done either electronically or personally - the transaction is electronically confirmed by sending a notification to clients.) The *level of transaction* does not only allow to conduct payments but it also gives an opportunity to issue certificates, licenses and passports, to extend their validity or replace them when it is needed, moreover, the possibility of online voting also appears at this level. Getting to this point, the issue of security, together with the requirement of identity verification become particularly significant as the level of transaction cannot be reached without implementing secure and appropriate e-signature applications.

The *level of integration* can be seen as the co-operation of various sub-systems in a virtual space with the primary aim of concentrating different resources. More precisely, concentration of resources is needed when a client has several cases and more local government bodies or departments are involved, or the large number of clients with the same case gives room for introducing one-stop public administration tools. Here, we can talk about a virtual one-stop administration where integrated case handling is used by having more sub-systems – including integrated information systems - connected to the network, making it possible for clients to use a whole range of services at the same place.

It is inconceivable to reach the *levels of transaction and integration* without providing credible identity verification. Furthermore, it is also necessary to ensure that electronically sent documents and declarations are valid, it must be checked whether their content remains the same between the period of sending and receiving them. The problem of saving electronic documents from unauthorized access also has to be solved. There are several alternatives to tackle this problem:

- Introducing electronic identity management (eIDM) which mostly takes the form of an electronic chip card. The identification itself can be made by a qualified electronic signature installed on the card that has a unique identification link. However, the chip card can be used for more purposes from electronic public administration to the digital signature of electronic documents.
- Documenting by the use of electronic signature.
- Connecting through a central electronic system. It can be resorted by digital signatures but it can also happen without it. This electronic system suited for identity verification can exclusively be used for arranging electronic public administration matters. Thus, natural persons or businesses not having digital signatures at the required security level do not exclude themselves from the electronic communication with public authorities and local governments. Clients are supposed to create a gateway through the central electronic service which is nothing more than a virtual entrance to the world of the electronic communication with local administrative bodies. A client gateway is a tool that ensures citizens having proper identification to get in contact with electronic administration services through a central electronic system in a secure way.

1.2.2 Front office work processes

a) E-administration (electronic administration services):

- Online information on e-administration to clients and customers (description of procedures about what documents should be provided for settling a matter, what rights and duties clients have during the

procedure, which department of local government handles the client's matter);

- Initiating an administrative procedure (making appointments, handing in submissions);
- Downloading forms and documents (for administrative purposes);
- Filling in, authorizing and forwarding forms and documents (after registration, the identification of clients is needed, having a user name and password enables clients to arrange those matters electronically that are based on an announcement or report such as tax returns, or other matters or persons that are subject to taxation);
- Electronic tracking of pending administrative matters;
- Complete electronic administration process (decision, delivery, administrative service fees, duties etc.)

b) Electronic customer care:

- Call center operation;
- 'Self-service' applications via the Internet;
- Customer Relationship Management systems, revealing users' habits and collecting their opinion on services. They focus on the current and future needs of users, the data obtained from them is used for future service developments.

c) Information of public interest, place marketing:

- Displaying information of public interest;
- Customer forums, mail exchange;
- Place marketing;
- Electronic public procurement.

1.2.3 Back office applications

The so-called back office deals with all the internal work processes within the offices of local governments. Any system can be considered to be the part of back office that runs in the background from the client's point of view, not requiring any direct contact with clients. Back office applications are responsible for performing data processing, that is, the management of administrative information. In order to make a plan for office computerization, or rather the implementation of other ICT devices, both determining the scopes of activities, and defining work processes are needed. During the thorough definition of work processes, decision-making mechanisms must be separated and the possibility of the standardization of internal work processes also needs to be examined. In order to do so, it has to be assessed that how many cases are dealt with by an organizational unit or department within the organization of the local government, it has to be determined where administrative matters begin and

when they are put to an end, which administrative matters are the most time-consuming and which ones take the shortest time to finish, and finally, what is the average workload of administrators. As a first step, the existing conditions within the organization should be explored. In accordance with getting an insight of existing conditions, it should be investigated that how they are related to the desired results after making the suggested changes. By taking this step, it becomes possible to explore the failures and drawbacks in existing work processes and determine the points where modifications are needed. The most important goals of developing the ICT infrastructure of offices can only be determined if we have a detailed picture on the initial conditions. After this, it becomes possible to determine which areas or procedures need to be developed, which ones do not need any kind of intervention or modification. Then it can be identified more easily whether the introduction of complex ICT solutions is needed in the preferred areas or it is enough to develop existing electronic systems.

1.2.4 *The interoperability of back office work processes*

The main back office activities where personal computers and computer networks can be applied are the following:

- Handling records and data archives;
- Decision-making processes,
- Creating databases, access to data;
- Holding meetings, sessions and assemblies, voting without personal attendance;
- Displaying geographically referenced data (by using a Geographic Information System).

In terms of **data handling**, the following systems and sub-systems can be distinguished:

- *Database Management System (DBMS)*: a set of software programs that controls the system organization, storage, management, and retrieval of data in a database. By applying such systems local governments obtain data that are necessary to make decisions in administrative matters.
- *Management Information System (MIS)*: a planned, integrated system of the collection, processing, storage and dissemination of data in the form of information needed to carry out the management functions. In a way, it is a documented report of the activities, covering the areas of planning, decision making, direct management and control).
- *Online Analytical Processing System (OLAP)*: a software technology that enables users to interactively analyze multidimensional data from multiple perspectives. Their structure is widely used in many management information systems nowadays. The efficiency of OLAP systems lies in their

capability of analyzing any level of aggregate data generated during the operation of organizations by using different assessment criteria.

- *Decision support modules:* integrated software applications that are regularly used separately in practice. Their role is to project the constant elements of an organization's operational plans to the available data, thus making it possible to model the probability of various contingency outputs. These outputs may also be affected by users as they can modify modeling rules.
- *Surveillance and monitoring systems:* applied in order to maintain and guarantee functionality and security.
- *Administrative systems:* used for supporting the actual work, that is local administration processes, performed in local government offices.

These systems often cannot be separated from each-other as purely as we may think, management information systems are often based on different data bases themselves, they are connected to or integrated with various administrative systems, and, in better cases, they are equipped with decision support modules. Back office applications have increasingly become an integrated system where its sub-systems are interwoven consistently, aligned into a dense, interconnected network. This interconnectivity is strongly underlined by the concept of interoperability.

Apart from the above-mentioned vertical areas, in the next chapter – understanding and explaining their significance - we will engage in the following horizontal fields: open source softwares, the concept of interoperability, the elements of electronic public administration services, using geospatial data (GIS) and digitization.

Summary of the main points that should be taken into consideration

- Electronic administration or office computerization cannot be developed without paying attention to other important conditions of its successful implementation. Local governments have to establish proper legal environment for electronic administration and make an extensive assessment of what local government activities and services can be performed or provided by using ICT devices, or rather what tools and systems can be used for fulfilling administrative purposes.
- When suggesting a general DLA plan, we need to bear in mind that it is not uniformly determined what central administrative tasks have to be performed by local governments. In terms of building electronic

infrastructure, the most frequently used administrative services prove to be significant; therefore the plan has primarily to focus on those services.

- Classification of the scopes of activities performed by local governments is a must if we want to understand the nature of their operations. When they are about to design and implement their own DLA plan, they are most likely to review and analyze the following three groups of activities: centrally determined administrative tasks, administrative services; exercising public authority involving local government bodies; dealing with local administrative matters.
- Based on the four development stages of front office functions (access, interaction, transaction, integration), it becomes possible to determine the level of their complexity and identify the measures to be taken for their improvement. The general DLA has to give well-structured solutions to the question of how local governments can develop their front office services in order to step into a more complex development stage.
- At local governments, any electronic system is designed to model work processes, with the aim of offering a solution that performs the same work processes in a faster and more efficient way. When formulating a general DLA for local governments, we need to examine the possibility of standardizing internal work processes ranging from the number of cases to decision-making mechanisms and the average workload of administrators.
- It seems to be necessary to do a thorough revision on the information systems that are already in use by local governments. Any new solution must be in line with existing systems in order to ensure easy and smooth communication between them, and meet the requirements of interoperability.

2. The role of back office and front office activities, possible areas of using ICT devices (a solution map)

In order to know our way around in the complicated system of the external and internal work processes at local governments, we decided to draw a solution map to show how the individual processes are linked to one another. It presents the modules of back office and front office applications of a local government. It can clearly be seen that back office applications connected to e-administration processes can be grouped around 'inputs', whereas front office activities have closer links to 'outputs'. However, the solution map is imperfect in a sense that it somewhat mixes vertical (administrative) processes with horizontal (methodological) processes (for instance, case management can be found in almost all administration tasks or providing communal services

cannot be seen independently from the use of GIS in public administration). Nevertheless, the solution map is susceptible to review the modules of electronic public administration and the ways how the individual groups of modules are related to each other.

Table 1 – The modules of front office and back office applications at local governments

Front office			
E-administration (electronic administration services)	1. Online information on e-administration to clients and customers; 2. Downloading documents and forms (for administration); 3. Filling in, authorizing and forwarding forms and documents; 4. Complete electronic administration process (decision, delivery, fees, duties etc.); 5. Electronic tracking of pending matters.		
Electronic customer care	1. Call center; 2. "Self-service" applications via the Internet; 3 Customer Relationship Management.		
Information of public interest, place marketing	1. Displaying information of public interest; 2. Customer forum, mail exchange; 3. Place marketing; 4. Electronic public procurement.		
Back office			
Local e-government	1. Supporting local council as well as committee meetings; 2. Providing infrastructure for local electronic referendums.		
Handling internal 'clients'	1. Online information (via Intranet or extranet); 2. Self-service applications (via Intranet or extranet).		
Public administration applications	Related to management: 1. Taxes and other revenues.	Related to public administration duties performed at local level: 1. Operation of offices of government-issued documents; 2. Registry Office; 3. Building authority tasks; 4. Geomatic engineering in local administration.	Related to local government administration: 1. Regional and local development, investments; 2. Public place management; 3. Industrial and trade administration issues; 4. Issues related to culture, education and sports activities; 5. Social and health services; 6. Other local government tasks; 7. Tasks related to guardianship and child protection; 8. Other local administration tasks; 9. Geomatic engineering in local administration.
Administrative (budgetary) applications	1. Accounting, finance, controlling; 2. Human resource management; 3. Asset management; 4. Investment, development projects and programs; 5. Electronic filing, document and work process handling; 6. Providing legal information (legal archives); 6. Administration of assets and trust management.		
Office computerization, communication	1. Word processing, documentation; 2. Formatting chart and other graphic reports; 3. Electronic mail (internal and external); 4. Making presentations; 5. Task administration, scheduling.		
Leadership information and decision support, knowledge management	1. Strategic planning and controlling; 2. Local government intelligence (decision support, data archives, data mining); 3. Documentation management; 4. Groupware (softwares used by work groups) 5. Internet, intranet and extranet (as information sources); 6. Artificial intelligence.		

It must be clear at the first sight that back office processes are a 'bigger bite' since they are much more complex and diversified than the devices applied by front office applications. (Yet, the paradox of e-administration development is that more substantial financial resources are available for the development of front office applications.)

2.1. Back office **work** processes

2.1.1. *Procedural and substantive actions in administrative work processes*

On the basis of legal regulation and practical realization, workflow or work processes at local governments can be divided into two broad areas: *procedural* and *substantive actions*.

Procedural actions cover the technical preconditions of making decisions and resolutions as well as the registration, storage, submit and disposal of received documents. These actions are the following:

- Receipt of documents;
- Filing;
- Document retrieval (after examining document history, attaching additional documents may be needed);
- Signing (appointing the competent administrator);
- Forwarding documents to other competent authorities;
- Archiving;
- Document disposal.
- All of the above-listed actions can be achieved with the extensive use of ICT devices. There are various workflow management softwares already in use by local governments, helping them to perform these actions automatically.
- *Substantive administrative actions* are directly connected to the decisions made by public administrative bodies. These administrative actions precede decisions, give the actual content of decisions and contribute to monitoring their execution. The related substantive actions are generally the following:
 - Appointing a competent administrator to handle the case in question;
 - Establishing facts and conditions;
 - Collecting, recording and processing all necessary information needed to make a decision or resolution;
 - Deciding whether the co-operation or assistance of another competent authorities is necessary;
 - Preparing a draft decision;
 - Making actual decisions or resolutions;
 - Ensuring and controlling the execution of legally binding decisions and resolutions.

Among substantive actions, mostly the automatization of decisions related to public administration duties seem to be worth considering. In doing so, three key questions can be raised at this point:

- what is the nature and the aim of the automatized decision;
- how can the mechanism of public administrative decision-making be described;
- how can public administrative decision-making be automatized in practice.

2.1.2. Basic requirements of automatizing administrative decision-making

Without exception, making public administrative decisions need law enforcement. Knowing this essential requirement, decisions can only be automatized if relating laws and regulations are formulated clearly and precisely, furthermore the structure of making decisions is unambiguously defined by the applied laws and regulations. The introduction of automatized decision-making can be advantageous because it significantly reduces the average time of administration processes. The first step in the mechanism of decision-making is to establish the facts and conditions of a case, look for the law or regulation relevant to the case in question and apply it accordingly. If the law gives clear guidance, the decision can be made by algorithms and computers. The automatization stages of decision-making mechanism are the following: *making algorithms* for 'yes' or 'no' answers in accordance with the criteria required by the law, *word processing* and *programming*. The automatization of decision-making mechanisms requires legislation to pay special attention to the possibility of translating the content of applied laws into the language of algorithms.

Finally, apart from carrying out individual work processes and making decisions in an automatized way, the ability to deliver a decision electronically is also a crucial condition from the public authority's point of view. As a consequence, public authorities and local governments have to obtain and use an electronic signature; the signature has to include a timestamp or another authenticated time indicator with an equivalent format.

2.1.3. The use of geographic information systems at local governments

Geographic information systems (GIS) have started playing a more and more important part in the activities of local governments. In a general sense, the term describes any information system that integrates, stores, edits, analyzes, shares and displays geographic information for informing decision-making.

The systematic use of GIS for public administration purposes can be introduced at local governments where other ICT devices are already applied for

electronic public administration. Otherwise, GIS systems would be isolated from other applications used by other departments within the organization of local governments, they would be hidden from citizens or clients as well. In terms of GIS applications, local governments can benefit from implementing such systems for recording geospatial data (record-oriented GIS) and generating new data based on input or raw data (object-oriented, decision-oriented GIS).

2.1.3.1. Record-oriented GIS

The group of record-oriented GIS applications include national digital base maps that every other GIS application has to be in compliance with, ensuring standardized data management (compatibility), spatial reference for locating geographical entities (cartographic projection) and orientation (navigation). Record-oriented map databases are widely used by local governments, mainly for the correct and up-to-date registry of properties, real estates and such technical infrastructure as gas, water, sewer pipes and electrical wiring. The purpose of implementing such digital map databases is the official control, inspection, administration (for instance, issuing licences), maintenance and providing information (issuing true copies of the title deeds) on real estates and other properties.

2.1.3.2. Object-oriented GIS

Object-oriented GIS applications are ideal devices for regional and urban planning, since almost all cartographic data is available in a digital format. Regional and urban spatial planning usually have three parts: an urban structural plan, an urban regulatory plan (supported by detailed maps) and a construction regulation. The map of the urban structural plan displays the objects of technical infrastructure (railways, roads, public utility systems) as well as hydrogeological data and land use categories within the whole administrative area of the region or settlement. The map of the urban regulatory plan represents the individual land use categories, the elements of technical infrastructure and the types of construction within the settlement or in several parts of the settlement. The main function of urban regulatory plans is to divide settlements into several sections of construction zones. They contain the lot number or other identification code of each and every property line within the individual construction zones, so the maps used for urban regulatory plans may serve as a data bank for property management and property registry. Maps containing plans for land use were compiled more and more often by relying on satellite images in the last two decades.

2.1.3.3. *Decision-oriented GIS*

The most advanced manifestation of geospatial information systems is their role in preparation for decision-making. This is the field where the qualities of GIS systems are the most rewarding. For instance, when comparing digital map series to one another, it is possible to display the same area or zone on a longer time scale, which makes it easier to track changes over time. Comparing various digital maps together allows GIS applications to select and evaluate specific locations displayed on the map. GIS can also give practical assistance to answer such questions as where the most endangered areas can be located in case of environmental damage, providing valuable background information for supporting decision-making processes.

2.1.4. *Legal aspects of database management systems and registers*

Keeping records of information represents one of the greatest challenge for public administration since performing administrative tasks is impossible without registering citizens, organizations, businesses, natural and built infrastructure. There are numerous and extensive registers, they can be divided into several groups on the aspects presented below.

Based on *legal effect*, we can make a distinction between:

- Registers with constitutive effect where some rights are created, modified or terminated (e.g. property registers);
- Registers with declarative effect where the entries do not create or change any rights, they are one-off declarations of rights instead (e.g. birth certificates).

Registers can also be *defined by their subject*:

- Personal data registers;
- Asset registers (e.g. real estates, automobiles, public utilities etc.);
- Intellectual property registers (e.g. patents, inventions etc.).
- Legislation archives (e.g. legislation records, law draft registrations).

Based on *the kind of administrative bodies*:

- Public administration registers (e.g. property registers at the Treasury Property Directorate);
- National registers;
- Sectoral and functional information systems;
- State Statistical Information System;
- Local government registers (such as municipal property registers);
- Mixed registers (e.g. registers of personal information and permanent addresses);
- Court registers (e.g. business registers).

In terms of *public authentication*:

- Public registers: registers required by law, the information included in them must be accepted by every person as true – unless proven otherwise (e.g. land registers);
- Non-public registers: a register that is kept advertently by the related public authority or local government, mostly to make their administrative work easier.

2.1.5. The main characteristics of registers

Registers are designed to meet the following four essential requirements:

- Providing an overview of the registered entities (persons, assets);
- Serving as a decision support tool;
- Recording the actual legal status of the registered legal entities;
- Enabling data analysis and their use for statistical purposes.

These databases are mostly computer-based (although we may find card index systems and redundant background in some cases). Considering how many different databases are running in Hungary as well as in the European Administrative Space, the interoperability of public administration is an inevitable condition for unified data handling (migration, archiving, processing, pooling etc.).

Based on the nature of public administration, computerized registers can be:

- Simple;
- Advanced or complex;
- Integrated.

Simple registers keep only basic units of data according to the criteria required by law or defined by the internal instructions of public administration bodies (e.g. register of civil servants, local government housing records etc.). In the case of *advanced or complex registers* two or more basic data units are recorded, which are also required by law or the internal instructions of public administration bodies (e.g. property registers that manage combined data of the property and its owner, vehicle registration in which the data of the vehicle and its owner is handled together). *Integrated registers* are the most advanced systems, they record a number of basic data units, these units are usually in a two-way communication with one other, based on the criteria of integration. Using such integrated register systems is advantageous as the parallel management of data can be eliminated, it facilitates to build up information chains by linking register subsystems to one another, which, in turn, provide information of new quality (e.g. municipal real estate registration systems

consisting of central modules, technical records and asset management modules that provides assistance to property management).

A brief summary of the main points that should be bear in mind:

- The solution map presents the modules of back office and front office applications of a local government. It was designed to review the modules of electronic public administration and the ways how the individual groups of modules are related to each other. It can also be observed that generating a DLA plan is impossible without understanding the complexity of back office activities performed by local governments.
- In order to understand public administration work processes performed by local governments, it has to be examined what actions can be automatized during the decision-making process. The vast majority of procedural actions is already automatized at local governments, formulating a general DLA should be focused on what steps or stages of substantive actions can be performed by using ICT solutions.
- We concluded that administrative decisions could only be automatized if relating laws and regulations were formulated clearly and precisely. The significance of this requirement must be reflected in the approach used for hammering out digital plans for local governments. Relevant plans can only be drafted if we have a better knowledge on the legal framework in which local governments operate.
- The use of geospatial information systems cannot be neglected. After identifying the fields where GIS applications are used by local governments, it becomes possible to determine the ways of how local governments can benefit from using GIS in their decision-making routines.
- As it was noted, keeping records represents one of the greatest challenges for public administration since performing administrative tasks is impossible without registering citizens, organizations, businesses, natural and built infrastructure. In this regard, a feasible general DLA plan has to present alternatives to how local governments can harmonize or integrate their existing registers into a more complex network, how they can use their existing data bases to ease the process of decision-making and, finally, how they can achieve the interoperability of such registers and data bases at a local, regional and national level.

3. Workflow management of internal procedures

As it was seen before, back office activities are a pool of ICT-related problems, yet we need to point out that information technology is only a necessary tool for modernization and infrastructure. In order to create an efficient electronic public administration, we have to take organizational, administrative and technological issues into consideration.

Many administration bodies and local governments fall into the trap of starting implementing new ICT devices without being aware of their own resources and opportunities: they are either in short of the necessary financial means or they lack an appropriate information strategy.

The most important goals of development can only be determined if we exactly know what is needed to be improved. In the case of local governments, it has to be surveyed that **how many cases are dealt with, where a case begins and where it ends**, which cases need the **longest time to be solved**, which cases are the **most problematic within the workflow**, what is the average workload of administrators and so on.

In order to find answers to these questions, there are several administrative and technological means at local governments' disposal. The most common techniques are workflow modeling, customer turnover tests, frequency analysis, job analysis that is often supplemented with in-depth interviews, questionnaires or document analysis.

These surveys can be used to identify the areas where development is needed, can be postponed or avoided.

As the complex administrative activities performed in back offices require the application of more and more complex workflow management systems at local governments, this chapter gives a brief theoretical overview of the architecture of workflow management systems. Understanding their operation is essential to formulate any kind of information strategy since *workflow management systems can be used for 'mapping' the whole network of activities done by local governments*.

3.1 The advantages of using workflow systems in public administration

The advantages of applying workflow systems to administration processes comprise the following:

- Specification: The application of workflow systems has the potential to lead to a better specification of administration processes, of regular (standard) processes and even more of special ad-hoc administrative processes. Even if this

is not a technical matter, experience shows that the organizational analysis and design needed to employ workflow systems increases the quality of administrative processes.

- Documentation: the application of workflow systems leads directly to an exact documentation of administrative processes. This integrated documentation also yields better traceability of processes, built-in status accounting, and improved responsiveness.

- Turn-around: a primary goal for employing workflow systems is to reduce turn-around times and therefore to improve reactivity.

- Flexibility: Comparing to traditional software solutions, workflow systems are much more easier to adapt. They allow a very dynamic and flexible redesign of administration processes to adapt to the needs of public administration. Furthermore, standardized cases or processes as well as non-standard ones can be dealt within the range of one system.

- Integration: workflow systems can act as 'glue' between various ICT devices allowing also the integration of existing systems in newly-formulated administrative processes.

3.2 Workflow and workflow management

Originally, the concept of workflow has evolved from the notion of *process* in manufacturing and the office. A process is often defined as a set of partial ordered steps with the purpose of reaching a specific goal. Processes typically consist of process elements which can be further decomposed into atomic process elements or process steps. It has to be noted that the terms '*workflow*' and '*process*' are often used as synonyms. In order to describe the characteristics of various workflow management systems, we do not find it necessary to make a distinction between them. Additionally, we use the term '*activity*' for describing process elements and the term '*task*' for individual process steps.

Workflow management involves the coordinated execution of an administration process, consisting of several activities and tasks which are performed either automatically by an information system or manually by an appointed administrator. Workflow management systems offer an environment to define and execute such processes. According the workflow reference model suggested by the Workflow Management Coalition (WMC), a workflow management system is *a system that completely defines, manages and executes processes through the execution of a software whose order of execution is guided by a computer representation of the process logic*. Based on this definition, the following two main areas of workflow management can be identified:

- Workflow specification: requires workflow models and methodologies for capturing a process as a workflow specification.
- Workflow implementation and execution: requires methodologies/technology for using information systems, and human performers to implement, schedule, execute, and control the workflow tasks as described by the workflow specification.

3.2.1 *Classification of workflow processes*

At present, we cannot find a generally accepted classification framework for workflows and workflow systems. As all classifications focus on some specific aspects, it will always be difficult and probably impossible to give a commonly accepted classification. Workflows can be characterized along a continuum from *human-oriented* to *system-oriented workflows*. In the first case, a workflow is mainly performed by human agents. The workflow management system is expected to support the coordination and collaboration of administrators who are responsible for consistent workflow results. In the second case, workflows are characterized as highly automated and computation-intensive processes which involve the integration of heterogeneous data and other subsystems.

3.2.1.1 *Static aspects of processes*

The static aspects of a workflow comprise all components which can be extracted from a workflow meta-model. There, the basic elements of a workflow are *activities*, *data objects* and *agents*. Within the static classification part, these elements are further characterized by the following features:

- Activities: activities are characterized by several attributes (for instance, name or status) and methods. Individual process steps (tasks) describe the real work items in a process. It is possible to make a distinction between manual and automatic (interactive or non interactive) tasks. Manual tasks are performed mainly by human agents or administrators. This mainly includes the manual start and manual termination of a given task. In this case, the work performed within the range of a manual task is fully under the control of the administrator (e.g. making a phone call, writing a letter, etc.). The workflow management system only supports administrators by providing them with appropriate standard tools (for instance, a word processor, etc.). Interactive automatic tasks are associated with specific software applications that are executed after a responsible administrator has selected the task from his worklist. During task execution the administrator communicates interactively with the associated program. As soon as the program terminates, the task also gets into its termination state. Non interactive automatic tasks are specific software applications that are started by the workflow management system and fully executed by the workflow

management system itself. The execution of the task does not need any human participation. The task terminates as soon as the associated program has finished.

- Data objects: within a workflow different kinds of data are handled. Here we have to make a distinction between data that are handled within the range of tasks and data that are needed for the execution of a process, for instance scheduling. These different kinds of data are not necessarily disjunctive. More precisely, in a workflow application we find the following two types of data:

- Application data: application data are used and produced by the tasks in a workflow. This sort of data can further be classified into structured, unstructured or semi-structured data. The main reason for this differentiation is to distinguish between data which can not only be used within tasks but also for defining the processes themselves. For a workflow specification, structured data (e.g. formatted data in a form) can be used easier than unstructured data (like documents).

- Process data: process data are necessary to define and control the execution of workflows. Typical examples are the state of tasks, the start time of a task and so forth.

- Agents: an important function of a workflow management system is to assign tasks to agents (either administrators or software applications) who are eligible to carry them out. The modeling and definition of agents composes very simple but also very sophisticated approaches. For our classification it is enough to make a distinction between human and non-human agents.

3.2.1.2 *Dynamic aspects of workflow processes*

The execution of a workflow mainly comprises the answers to the following core questions: What (activity) has to be executed when, by whom and with which data? There are functional (what), behavioral (when), organizational (whom) and informational (which data) perspectives in these questions. It has to be emphasized that the behavioral aspect (temporal execution order of the various activities within a workflow) is an essential issue. Based on this, we needed to find an answer to the question of how correct activity-sequences can be defined or achieved in a workflow. Theoretically, there are two possibilities:

- Ad hoc and without a corresponding formalism: within this approach correct activity sequences are determined occasionally by human agents during workflow execution. Additionally, we distinguish whether the correct sequences are defined with or without predefined activities. In the first case, a workflow is composed of already defined parts at run time while in the other case the agents have the possibility to define new activities during run-time. This concept is also valid for workflow

management systems not based on activities but on agents (e.g. email-based workflow management systems). According to this terminology each agent has to decide who should be triggered next in order to perform the next phase of the workflow.

- With a corresponding formalism: valid activity sequences are defined during workflow modeling time by the workflow designer. As a consequence, workflow management systems offer modeling tools which allow the definition of administrative processes based on a special formalism. Main differences between the various formalisms depend on the available process information and on the access to application data.

3.2.1.3 Types of workflow processes

Based on the above-mentioned classification features, now it is possible to identify at least two main types of workflows:

- Document-oriented workflows: document-oriented workflows are mainly characterized by the existence of manual tasks and unstructured or semi-structured documents. The execution of the workflows are primarily controlled by human agents (administrators). They normally have to decide during workflow execution *when* a specific task is performed, *which* task should be executed next (in case there is a set of potential successor tasks) and *who* should execute the next task. The requirements for workflow management systems are to support the coordination and collaboration of human agents responsible for consistent execution results.

- Process-oriented workflows: process-oriented workflows include mainly automatic tasks and structured or semi-structured data objects. The processes may be very complex which makes it necessary to define adequate formalisms. Furthermore, the tasks in general perform complex operations based on autonomous systems. Workflow management systems supporting this type of administrative processes control and coordinate the execution of the tasks with little or without any human participation. Therefore, various concurrency and recovery mechanisms are necessary to guarantee a reliable and consistent execution.

3.3 Specifying and executing a workflow

In order to perform workflow specification a *workflow meta-model* is necessary. Such a model typically includes a set of concepts which are useful to describe processes, their process steps (activities and/or tasks), the dependencies among process steps, and the required agents that are eligible to

perform the specified process steps. The specification usually is based on a *workflow specification language*. These languages use rules, constraints, sometimes graphical constructs to describe the structure of complex workflows. In the process of workflow specification the workflow designers are faced with the identification and modeling of functional, behavioral, organizational and informational aspects of a complex business process

In the *functional part* of a workflow specification the workflow designer's task is to specify *which* processes have to be performed. In order to achieve this purpose, a complex workflow is decomposed into smaller sub-workflows or activities until *elementary workflows* or tasks are remaining. (Workflows containing other workflows are sometimes called composite workflows.) Elementary workflows are associated with applications which implement the corresponding function. Applications may be any kind of executable code (e.g. software applications, command procedures) as well as some tasks that are fully performed by an administrator (e.g. making a phone call, writing an email). The information exchanged between the activities is stored in forms, the flows describe the path of these documents through the activities in which they are used. One important aspect in workflow modeling is that tasks are *black boxes* which are used and reused by the workflow designer. It is only the interface of a task that needs to be made visible in order to communicate with other tasks. The execution of a hierarchically structured workflow starts at the top-level workflow in the hierarchy by executing the first underlying layer of sub-workflows. The execution order is determined by the behavioral information in the specification. Recursively, processing continues until the lowest level is reached where the referenced applications of the elementary workflows are executed. Before and after a single task is executed, several steps have to be performed. These steps are the following:

- An optional after-procedure of the task is processed;
- The postconditions of the task are evaluated. If the postconditions are fulfilled, the documents manipulated by this task are marked as processed and the task is finished, in the other case the task gets an error message;
- Every output flow of the task is checked and if the flow condition is met, the form is sent to the successor task and gets the status pending;
- The preconditions of every successor task are evaluated. If all preconditions of a task are met the task is ready;
- If there is a task ready, the next step is the assignment of an administrator to the task. The selection criterion is evaluated and a concrete administrator is assigned to the task;
- Next the before-procedure is started;
- A signal is sent to the program or the administrator assigned to perform the task.

In the behavioral part of a workflow specification it is defined *when* processes are performed. The inter-dependencies between complex and

elementary workflows are determined through the control flow. Of course, the specification of the control flow is not always possible and wished at modeling time, as for example in ad-hoc workflows. The most important control flow concepts are *serial* execution, *alternative* execution and *parallel* execution. Within the organizational part of a workflow specification the workflow designer specifies *who* is intended to execute a workflow (or the corresponding application of an elementary workflow).

In order to achieve a higher degree of flexibility, a simple role-concept is often used. This means that the executor of a process is not directly connected to a user but to a role (e.g. an administrator, a technical assistant) which is an abstract description of certain skills which are necessary to perform a task. Roles are further associated with one or more users or to an information system. At runtime the system selects one of the agents who is defined by the role to execute the task. The informational part of a workflow specification deals with the data flow aspects and the definition of information elements which are manipulated by workflows.

3. 4. Workflow systems based on databases

There are two different approaches in implementing workflow management systems: the so-called *mail-based* systems exchange documents between the different agents by email or a similar mechanism. *Database-based* systems store the documents and the process information in a database to which all agents (administrators and software applications) must have access to. As the administrative systems at local governments use several databases during their daily operations, let us take a look at the benefits this approach may offer to them:

- The execution of a workflow is a typical task for a client-server application. Normally, many clients from different location, probably running on different platforms connect to the workflow server. Crashes of one of these systems or disconnections in the network are therefore very likely. The recovery mechanism of the database management system ensures that after crashes of clients or the server, a consistent state of every running process is restored.
- Central storage of all documents in the database ensures document integrity, preventing that different administrators work on different copies of a document, an explicit versioning can be handled by the database.
- Workflow processes should provide a high degree of concurrent execution to decrease turnaround times. The transaction mechanism permits to increase concurrency in a safe way. For instance, it is possible that

different administrators view a document concurrently, or different administrators edit different parts of the same document. The concurrency control system of the database can directly be used and it is not necessary to re-implement an additional one for the workflow machine.

- Modern database management systems provide application programming interfaces (so-called APIs) to various languages and allows access over the network. These features are necessary, when coupling applications with the workflow system is required. The applications can communicate with the server only by making selections and updates in the server's database.
- The presence of all information about the dynamic state of processes and tasks in the database allows an easy implementation of a monitoring component. This part of the workflow management system allows the administrators and system operators to inspect the state of the processes, the content of documents and the work-lists of individual administrators. All this can be retrieved by simple SQL queries. The authorization system of the database is used to control the different privileges of the administrators. In very large systems the single central server architecture can be a performance problem, in this case it is possible to use a net of distributed databases, sharing the information about the processes. Furthermore, the execution of an administrative process can be seen as a long transaction, needing more than the traditional built-in transaction mechanisms (concurrency control and recovery) of the database management system.

3.5. The use of active databases during workflow execution

The decision-making processes at local governments do not only require the use of passive databases. There can be many fields where decision-making is supported better by applying active databases. Active databases are well suited for applications which are inherently data driven or event driven. These systems extend passive databases with production rules. They allow the specification of actions which are executed automatically whenever certain events occur and certain conditions are fulfilled. The specification of Event, Condition and Actions is usually done with so-called ECA-rules. The advantages of using active databases as base technology for implementing workflow systems are the following:

- All dynamic information like the status of processes, documents, etc. are mapped to the database and maintained within a database system. Thus the capabilities of database systems like safety, authorizations, and most important recovery are immediately available. In the case of system

crashes, the recovery mechanism of the database also recovers the dynamic state of all processes.

- In case of *active* databases being employed, the database is not only the blackboard for the workflow processes, but it can be regarded rather as the automated workflow machine itself. In other words, the scheduler and the agents do not have to poll the database whether the preconditions of some process are fulfilled, creating an unnecessary high workload or reducing responsiveness.
- The development of the workflow server is very easy because only the rule compiler has to be implemented, the trigger mechanism is already part of the database.
- Once all dynamic process information is stored in the database, monitoring the processes can be done with queries to the databases and components based upon such queries. It means that no additional book-keeping is necessary.
- Fields in the data forms can be easily used for control purposes: For example, a form field can be used to specify the performer of the next task. The database trigger assigning the administrator, which is generated from the process description simply read the value of the field and assigns the task to this value.
- Existing applications can trigger a workflow: It is possible to define rules, that react on changes performed by other applications. For instance, an application, which handles the filing process would modify the archive information.

A brief summary of the main points identified

- Although the concept of workflow and the use of workflow management systems first appeared in the world of business, they can effectively be used for describing and understanding the compound system of back office applications at local governments. The main reason why we are in favour of the workflow-oriented approach is that the steps of public administration work processes can be translated and integrated into a specific language of workflow management systems. Following this approach, it becomes possible to model internal activities at local governments and suggest solutions to improve their corresponding workflow systems.
- As it was stated, the execution of workflow processes mainly comprises the answers to the following core questions: What activity has to be executed when, by whom and with which data? In order to understand the

nature of the activities covered by back office applications, *compiling a catalogue of processes is needed*, showing the individual steps to be followed as well as they ways how they are correlated to one another. An effective DLA plan has to provide alternatives to automatize work processes with the help of customized workflow management systems.

- It was previously noted that a wide variety of databases are used during the daily practice of local governments. However, decision-making processes do not only require the use of passive databases. There can be many fields where decision-making is supported better by applying active databases. Active databases are well-suited for applications which are inherently data driven or event driven, they allow the specification of actions which are executed automatically whenever certain events occur and certain conditions are fulfilled. A general DLA plan has to be able to identify the areas where active databases can be applied by local governments and give a guidance on how active databases can be implemented most effectively.

4. Data security panning

In order to plan data security for any kind of organization, a systematic security methodology is needed. The security methodology drafted in this chapter is aimed at giving a general guide to data administrators at local governments to develop a strategy for protecting the *availability, integrity, and confidentiality* of administration data in the Information technology systems of local governments. The methodology itself provides a systematic approach for performing this very important task.

4.1 The three basic aspects of data protection

Data can be at risk from various sources in an information technology system, for instance from administrator errors and malicious or unintentional attacks. The occurrence of accidents cannot be excluded and attackers can deliberately get access to the system. It can result in disrupting services, rendering well-functioning systems completely useless or altering, deleting and steal ing information from databases of restricted use. In order to eliminate the chance of possible attacks and hidden threats, an IT system used by local governments needs protection for the following three aspects of data.

- Availability: The system contains information or provides services that must be available on a timely basis to meet mission requirements or to avoid substantial losses;

- **Integrity:** The system contains information that must be protected from unauthorized, unanticipated or unintentional modification;
- **Confidentiality:** The system contains information that requires protection from unauthorized access and disclosure.

As in any other organization, security administrators at local governments need to decide how much time, money, and effort needs to be spent in order to develop the appropriate security policies and controls. They should analyze the specific needs of a division or department and determine their resources and scheduling requirements and constraints. Although it is true that computer systems, programme environments and organizational policies are very diverse which, in turn, makes individual computer security services or strategies unique to a certain extent, the principles that have to be kept in mind when planning an effective security system more or less remain the same.

It is also true that a well-established security strategy can save local governments valuable time and provide important reminders of what needs to be done but making sure about proper security is not a one-off activity, it can be rather seen as an integral part of the system lifecycle. Therefore, the main points of a security strategy presented below, as a rule, require either periodic updating or revision. Of course, these modifications are necessary to be made when configurations or other conditions change significantly but it is also possible when organizational regulations and policies require changes.

4.2 The main steps of elaborating a security strategy

Establishing an effective set of security policies and controls requires using a strategy to determine the vulnerabilities that exist in computer systems and in the current security policies and controls that guard them. The current status of computer security policies can be determined by reviewing the list of documentation that follows. The review should take notice of areas where policies are lacking as well as examine existing documents:

- Physical computer security policies such as physical access controls;
- Network security policies (for example, e-mail and Internet policies);
- Data security policies (access control and integrity controls);
- Contingency and disaster recovery plans and tests;
- Computer security awareness and training;
- Computer security management and coordination policies.

4.2.1 Proactive and reactive security strategies

Assessing an organization's security needs also includes determining its vulnerabilities to known threats. This assessment entails recognizing the types of assets that an organization has, which will suggest the types of threats it needs

to protect itself against. Listing the threats helps security administrators to identify the various methods, tools, and techniques that can be used in an attack. Attacking methods can vary from malicious viruses and worms to password and e-mail cracking. It is important for administrators to update their knowledge of data security on a continual basis, because new methods, tools and techniques for circumventing security measures are constantly being devised. The security plan of an organization can serve its security needs well if it includes a *proactive* strategy as well as a *reactive* strategy.

The *proactive* or pre-attack strategy is a set of steps helping to minimize existing security policy vulnerabilities and develop contingency plans. Determining the damage that an attack may cause on a system and the weaknesses and vulnerabilities exploited during this attack can be a powerful helping tool in developing the proactive strategy. The aim of *reactive* or post-attack strategy is to give assistance to security administrators to screen and assess the damage caused by the attack, repair the damage or implement the contingency plan developed in the proactive strategy, document and learn from the experience, and get everything back to normal as soon as possible.

4.2.2 Testing possible attacks

The last element of a security strategy, testing and reviewing, is normally carried out after the reactive and proactive strategies have been put into place. If security administrators at local governments are prepared to performing simulation attacks on a test system, it makes it possible for them to assess where the various vulnerabilities exist and adjust security policies and controls accordingly. It is important to note that these tests should not be performed on a live and running system because the outcome could be disastrous. Yet, the absence of test computers due to budget restrictions is a frequent problem at local governments and it might prevent security administrators employed there from simulating attacks. In order to raise the necessary funds for testing, it is important to make local government officials aware of the risks and consequences of an attack together with the security measures that can be taken to protect the administration system, including testing procedures. It would be ideal if all attack scenarios were physically tested and documented to determine the best possible security policies and controls to be implemented. Testing and adjusting security policies and controls based on the test results is an iterative process. It is never finished and should be evaluated and revised periodically so that improvements can be implemented.

4.3 Methodology for defining security strategies

The following part of this chapter discusses a draft methodology for defining a computer security strategy that can be used by local governments to implement security policies and controls to minimize possible attacks and threats.

The methods presented below can be used for all types of attacks on computer systems, whether they are malicious, non-malicious or natural disasters, and can thus be re-used repeatedly for different attacks.

4.3.1 *Predicting attacks and analyzing possible risks*

The first phase of the methodology is to determine the attacks that can be expected and ways of defending against these attacks. Of course, It is virtually impossible to prepare against all kinds of possible attacks; therefore, the most reasonable thing to do is to prepare for the most likely attacks that an organization can expect. As a rule, It is always better to prevent or minimize the possibility of attacks than to repair the damage after an attack has already occurred. In order to minimize attacks it is inevitable to understand the various threats that cause risks to systems, the corresponding techniques that can be used to compromise security controls, and the vulnerabilities existing in the security policies. Understanding these three elements of attacks can help security administrators to predict the probability of their occurrence and, in some cases, their timing or location. In other words, predicting an attack is a matter of predicting its likelihood, which depends upon comprehending its various aspects.

4.3.2 *Threats and attack methods*

All of the possible threats must be considered that cause attacks on systems. These usually include malicious attackers, non-malicious threats, and even natural disasters, for instance a fire in the server room. Threats such as ignorant or careless employees and natural disasters do not involve motives or goals; therefore no predetermined methods, tools, or techniques are used to launch an attack. Almost all of these attacks or security infiltrations are internally generated; rarely will they be initiated by someone outside of the organization.

Let us take a look at an even more serious threat when a malicious attacker decides to break into the organization's computer system. In order to launch an attack, a malicious attacker needs a method, tool or technique to exploit various vulnerabilities in systems or security policies. A malicious attacker can use different methods to launch the same attack. Therefore, the defense strategy must be customized for each type of method used in each type of threat. Again, it is important to keep in mind that security administrators have to keep current on the various methods, tools and techniques used by attackers. The short list of these techniques is as follows:

- Password cracking;
- E-mail cracking;
- Denial of service attacks;
- Intrusion attacks;
- Social engineering;
- Viruses;
- Worms;
- Trojan horses;

- Packet modification;
- Packet replay.

4.3.3 Proactive Strategy

The *proactive strategy* is a set of predefined steps that should be taken to prevent attacks before they occur. These steps include looking at how an attack could possibly affect or damage the computer system and the vulnerabilities it possibly exploits. The knowledge gained in these assessments can help in implementing security policies that will control or minimize the attacks. These are the three common steps of the proactive strategy:

- Determine the damage that the attack will cause;
- Determine the vulnerabilities and weaknesses that the attack will exploit;
- Minimize the vulnerabilities and weaknesses that are determined to be weak points in the system for that specific type of attack.

Following these steps to analyze each type of attack has a side benefit; a pattern will begin to emerge, because many factors will overlap for different attacks. This pattern can be helpful in determining the areas of vulnerability that pose the greatest risk to the enterprise. It is also necessary to take note of the cost of losing data versus the cost of implementing security controls. However, security policies and controls will not, in every case, be completely effective in eliminating attacks. For this reason it is necessary to develop contingency and recovery plans in the event that security controls are penetrated.

4.3.4 Determining possible damages

Possible damages can range from minor computer glitches to catastrophic data loss. The damage caused to the system will depend on the type of attack. Again, using a test environment is strongly advised to clarify the damages resulting from different types of attacks. It can be beneficial for security administrators because they are able to see the physical damage caused by an experimental attack. However, not all attacks are likely to cause the same damage. Here are some examples of tests to run:

- Simulating an e-mail virus attack on the test system, and see what damage was caused and how to recover from the attack;
- Using social engineering in order to obtain a username and password from an unsuspecting employee and observe whether he or she complies;
- Simulating a malicious virus attack. Note the time required to recover one computer is noted and the resulting time is multiplied by the number of computers infected in the system to ascertain the amount of downtime.

It is also a good idea to set up and involve an incident response team within the organization because a team of administrators is more likely than an individual to spot all of the different types of damage that have occurred.

4.3.5 Vulnerabilities and weaknesses

If the vulnerabilities that a specific attack exploits are discovered, current security policies and controls can be altered or new ones can be implemented to minimize these vulnerabilities. Determining the type of attack, threat and method makes it easier to discover existing vulnerabilities. This can be proved by an actual test. The question list of possible vulnerabilities in the areas of physical, data, and network security can be read below.

4.3.5.1 Data security

- What access controls, integrity controls, and backup procedures are in place to limit attacks;
- Are there privacy policies and procedures that users must comply to;
- What data access controls (authorization, authentication, and implementation) are there;
- What user responsibilities exist for management of data and applications;
- Have direct access storage device management techniques been defined, what is their impact on user file integrity;
- Are there procedures for handling sensitive data.

4.3.5.2 Network security

- What kinds of access controls (Internet, wide area network connections, etc.) are in place;
- Are there authentication procedures; what authentication protocols are used for local area networks, wide area networks and dialup servers; who has the responsibility for security administration;
- What type of network media, for example, cables, switches, and routers, are used; what type of security do they have;
- Is security implemented on file and print servers;
- Does your organization make use of encryption and cryptography for use over the Internet, Virtual Private Networks (VPNs), e-mail systems, and remote access;
- Does the organization conform to networking standards.

4.3.5.3 Physical security

- Are there locks and entry procedures to gain access to servers;
- Is there sufficient air conditioning and are air filters being cleaned out regularly; are air conditioning ducts safeguarded against break-ins;
- Are there uninterruptible power supplies and generators and are they being checked through maintenance procedures;
- Is there fire suppression and pumping equipment, and proper maintenance procedures for the equipment;

- Is there protection against hardware and software theft; are software packages and licenses and backups kept in safes;
- Are there procedures for storing data, backups, and licensed software off-site and onsite.

4.3.6 *Eliminating vulnerabilities and weaknesses*

Making an attempt to eliminate the security system's vulnerabilities and weaknesses that were determined in the previous assessment is the first step in developing effective security policies and controls. This is when the proactive strategy can be useful. By minimizing vulnerabilities, security administrators can minimize both the likelihood of an attack, and its effectiveness, if one does occur. However, security administrators have to be careful about not implementing too strict controls because the availability of information could then become a problem. There must be a careful balance between security controls and access to information. Information should be as freely available as possible to authorized users within the organization.

4.3.7 *The importance of making contingency plans*

A contingency plan is an alternative plan that should be developed in case of an attack penetrating the system and damaging data or any other assets with the result of freezing or blocking normal operations. The plan is put into effect and followed if the system cannot be restored in a timely manner. Its ultimate goal is to maintain the availability, integrity and confidentiality of data, in other words, it is the proverbial plan B. Each plan consists of a set of steps to be taken in the event that an attack breaks through the security policies. The contingency plan should meet the following requirements:

- It has to address who must do what, when, and where to keep the organization functional;
- It has to be rehearsed periodically to keep administrators up-to-date with current contingency steps;
- It has to cover restoring from backups;
- It has to determine the process of updating virus software;
- It has to cover moving local administrative operations to another location or site.
- The following points outline the various evaluation tasks that should be evaluated to develop a contingency plan:
- Evaluate the organization's security policies and controls to accommodate any opportunities found for minimizing vulnerabilities. The evaluation should address the organization's current emergency plan and procedures, and their integration into the contingency plan;

- Evaluate current emergency response procedures and their effect on the continuous operation of administration;
- Develop planned responses to attacks and integrate them into the contingency plan, noting the extent to which they are adequate to limit damage and minimize the attack's impact on data processing operations;
- Evaluate backup procedures, including the most recent documentation and disaster recovery tests, to assess their adequacy and include them in the contingency plan;
- Evaluate disaster recovery plans to determine their adequacy in providing a temporary or longer term operating environment. Disaster recovery plans should include testing the required levels of security so that security administrators can see if they continue to enforce security throughout the process of recovery, temporary operations, and the organization's move back to its original processing site or to a new processing site.

4.3.8 *The role of reactive strategies*

A reactive strategy is implemented when the proactive strategy for the attack has failed. The reactive strategy defines the steps that must be taken after or during an attack. It helps to identify the damage that was caused and the vulnerabilities that were exploited in the attack, determine why it took place, repair the damage that was caused by it, and implement a contingency plan if one exists. Both the reactive and proactive strategies work together to develop security policies and controls to minimize attacks and the damage caused during them.

In order to determine the cause of the damage, it is necessary to understand what resources the attack was aimed at and what vulnerabilities were exploited to gain access or disrupt services. Reviewing system logs, audit logs, and audit trails is needed to get closer to the possible aims of the attack. These reviews often help in discovering where the attack originated in the system and what other resources were affected.

Once an attack has taken place, it has to be thoroughly documented. Ideally, documentation on attacks should cover all aspects, including: the damage that is caused (hardware, software, data loss or perhaps loss in productivity), all the vulnerabilities and weaknesses that were exploited during the attack, the amount of time lost, and the procedures taken to repair the damage. Documentation also must be used as a guidance to modify existing proactive strategies for preventing future attacks or minimizing possible damages.

A brief summary of the main points identified

- In order to plan data security for any kind of organization, a systematic security methodology is needed and local governments are no exception to this rule. Within the broader frame of the general DLA, it has to be made clear to local governments that they cannot avoid a strategy for protecting the availability, integrity, and confidentiality of administration data in their Information technology systems of local governments.
- Local governments, as any other organization need to have proactive as well as reactive strategies in their data and network security policy. The proactive strategy is a set of steps helping local governments to minimize existing security policy vulnerabilities and develop contingency plans. The aim of the reactive strategy is to give assistance to security administrators to screen and assess the damage caused by the attack, repair the damage or implement the contingency plan developed in the proactive strategy, and finally restore the operation of online or other ICT-based administration services.
- It was noted that the absence of test computers due to budget restrictions is a frequent problem at local governments and it might prevent security administrators employed there from simulating attacks. It cannot be emphasized more strongly that, in order to raise the necessary funds for testing, it is important to make local government officials aware of the risks and consequences of an attack together with the security measures that can be taken to protect the administration system, including testing procedures.
- Because local governments record, keep and handle a large amount of sensible or confidential data with restricted access, it is inevitable for local them to possess an alternative plan that should be developed in case of an attack penetrating the system and damaging data or any other assets with the result of freezing or blocking normal operations. The plan has to be put into effect and followed if the system cannot be restored in a timely manner. Its ultimate goal is to maintain the availability, integrity and confidentiality of data.

5. Website development and stand-alone web services

Governmental information and services on the web are typically provided by different organizations as independent web pages, databases, services etc. at different web locations. This creates severe obstacles for citizen end- users. First, discovery of relevant content is difficult because it requires prior knowledge of the administrative organization providing the contents. Second, the information and service needs often require aggregation of content from several information providers, which is difficult if heterogeneous content is provided by several independent web sites. For example, when a new baby is born, relevant information for the family is provided by health care organizations, social organizations, the church, legal administration, and others. Portals try to ease these problems by collecting content from various organizations into a single site organized according to the clients expected information needs. Portals can be broadly classified into three major groups by their functionality:

- First, service portals collect a large set of services together into a localized miniature version of the web and are meant for wide audiences. Such portals include Yahoo! and other “start pages” provided by various Internet service providers for their customers.
- Second, community portals act as the virtual socializing or meeting place of a community.
- The community can be evolving around the portal itself, or the portal can act as the extension of the community members’ activities. Community portals frequently contain bulletin boards and other means of communication.
- Third, information portals act as hubs of data on the web either by containing a large amount of information about a domain within the portal or contain a structured collection of annotated hyperlinks to other resources.

5.1 Static web pages

Static web pages don’t change content or layout with every request to the webserver. They change only when a web author manually updates them with a text editor or web editing tool like Adobe Dreamweaver. The vast majority of web sites use static pages, and the technique is highly cost- effective for publishing web information that doesn’t change substantially over months or even years. Many web content management systems also use static publishing to deliver web content. In the cms the pages are created and modified in a dynamic database-driven web- editing interface but are then written out to the web server

("published") as ordinary static pages. Static pages are simple, secure, less prone to technology errors and breakdown, and easily visible by search engines.

5.2 Dynamic web pages

Dynamic web pages can adapt their content or appearance depending on the user's interactions, changes in data supplied by an application, or as an evolution over time, as on a news web site. Using client- side scripting techniques (xml, Ajax techniques, FlashActionScript), content can be changed quickly on the user's computer without new page requests to the web server. Most dynamic web content, however, is assembled on the web server using server- side scripting languages (asp, jsp, Perl, php, Python). Both client and server- side approaches are used in multifaceted web sites with constantly changing content and complex interactive features. Dynamic web pages offer enormous flexibility but the process of delivering a uniquely assembled mix of content with every page request requires a rapid, high- end web server, and even the most capable server can bog down under many requests for dynamic web pages in a short time. Unless they are carefully optimized, dynamic web content delivery systems are often much less visible to search engines than static pages. Always ask about search visibility when considering the merits of a dynamic web content system.

5.3 The definition of web portals

Traditionally, a portal denotes a gate, a door, or entrance. In the context of the World Wide Web, it is the next logical step in the evolution to a digital culture. Web pages are not completely self- referential anymore, but allow for personalization, workflow, notification, knowledge management and groupware, infrastructure functionality, and integration of information and applications. The idea of a portal is to collect information from different sources and create a single point of access to information - a library of categorized and personalized content. It is very much the idea of a personalized filter into the web. Portals are often the first page the web browser loads when users get connected to the Web or that users tend to visit as an anchor site. They offer users a surplus value of service based on the features of classic search engines: a well trained concierge who knows where to search and find; a well- assorted newspaper kiosk that keeps the latest market information about the surfer's personal stocks ready; free communications possibilities like email or discussion boards. Thus, the traditional virtual roadhouses - the search engines- become entrance halls, a gateways to the internet, easy, one- stop embarkation points for the daily Web- surfing sessions. The hope behind the idea of a portal: surfer start their voyage into the

web in a modern entrance hall, and preferably find their way back to the starting point without major difficulty.

5.4 Portal functionality areas

- Information Catalogue Management. Portals must provide a mechanism to organize content into categories that are meaningful to users (e.g., a category tree similar to Yahoo).
- Content Management. As portals grow in scope, content sources proliferate. Content management becomes critical, particularly since content dynamically flows into the portal in near-real time. The ability to manage this content becomes an important shared portal service.
- Repository Management. Portal frameworks must incorporate a repository to store information as well as support access to information stored in file systems and other repositories (e.g., report servers, doc stores).
- Metadata Management. Beyond the content itself, metadata has become a critical linchpin to assist organizations in applying a taxonomy over large collections of information.
- Personalization Engine. Portals deliver a unique user interface by establishing customized navigational structures, content, and application interfaces.
- User Profile/Membership Management. Going hand-in-hand with personalization, profile management will enable users to set wallpaper backgrounds, localization parameters, and other characteristics. These personalization characteristics will be available to other applications and services plugging into the portal.
- Activity Tracking. Monitoring on-site behavior enables recommendation engines to suggest other information and application interactions based on explicit and implicit associations made while users traverse a site.
- Access Control. Authentication and access controls are essential portal underpinnings. Users should expect a single sign-on capability as they interact with the spectrum of applications, content, and services available through the portal.

5.5 Public web portal standards

A variety of public goods and services are provided by local governments, including education, public safety, infrastructure, and human services. Many of these services have web-based components with the goal of providing one-stop portals for public services.

Local government web portals have received less attention in the e-government literature, but have some of the richest problems. In particular, human services are complex and can benefit much in efficiency and effectiveness of delivery through properly designed and integrated web portals.

Public administration bodies and local governments need to deploy and maintain thematic portals. These portals need to meet the following basic requirements:

- easy availability;
- customer-oriented, user-friendly interface;
- clarity, simplicity;
- thematically structured features;
- reliable, updated information and services - covering the following four topics
- in the case of portals run by local governments:
- information about the settlement, place marketing;
- institutional information related to the operation of local governments and local government agencies;
- providing the opportunity to use e-public administration services;
- business, commercial, civil and other information;
- error-free operation, fast communication;
- content management based on monitoring and evaluating user behaviour;
- data security, protection of personal data;
- providing multilingual content (with regard to tourism, national ethnic minorities and town-twinning);
- compliance with W3C WAI recommendations in the spirit of inclusiveness;
- compliance with KIETB recommendations in the spirit of unity and
- standardization.

5.5.1. Accessibility and basic features

The Internet is virtually a world-wide network of computers. When developing thematic portals, decision-makers at local governments have to keep in mind that users have very different computer configurations (using mostly older personal computers), they use different Internet browsers (in 90% of cases either Internet Explorer or Firefox) and they have access to the Internet at different often still quite low speeds. Another equally important practical aspect is easy accessibility.

It is not always an easy task to find the requested website in the sea of millions and millions of other webpages, so it would not hurt if it is easy to guess the url address of a website or portal, or it is easy to navigate to from another presumably well- known site in a few simple steps. For these reasons, the basic features of portals should be the following:

- simple, logical and internationally accepted url address in the form of `www.<settlement name>.<country domain code>`, written without accentuated letters;
- quick download, which is essential if there is a simple web page design (minimizing the amount of animation, images, wallpapers and other promotional items);
- setting screen resolution to 800x600 (256 colors) as a default, bearing in mind that the majority of users still use older computer configurations;
- compatibility with the most commonly-used Internet browsers such as Internet Explorer and Firefox.

5.5.2 General basic functions

Every portal has to provide certain basic functions. Their range, of course, may vary depending on the size, complexity, nature of different user groups. Public institutions are usually complex organizations providing a number of services to a very diverse customer base (civil, business, public sector, researchers, tourists, residents, students, senior citizens etc.) with a very differing online experience. Therefore, the following functions are absolutely necessary regardless of the main purposes of the institution:

- search for available services and documents;
- facilitating contact and feedback, e-mail address(es), online guestbook;
- guidance on using the portal: help, sitemap, tutorials, etc.;
- language selection: apart from the official language(s) in addition to - the date of the tourist and business goals of foreign visitors is extremely important - in practice this has to be English as the main language of international communication (which is especially true for Internet users). In addition, the national bound from the typical relationship, depending on some other world language(s) - German, French, Spanish, Russian, Chinese - the choice may be justified.

5.5.3 Portal features

The portal is marked as already mentioned by a wide range of services (news, thematic search possibilities of general topics, links, software downloads, games, useful o public information, e- commerce, e-mail, mailing lists, forums, adverts, extensive web search, etc.). The government pages of a number of the case observed in the administrative functions, in addition, portal-wide services portfolio, as these pages can also be visited by Internet users without a specific

target, as a consequence, this will allow the portal to be the virtual meeting place of the town, a virtual center in the world. Such portals often comprise the following functions:

- general scale search engine;
- useful links in thematic clusters;
- news, events, press conferences - in particular the activities of local government or the country, the most important village news, events, upcoming events;
- public information, schedules, programs and cultural events;
- basic information: local time, date, weather, visitors, etc.;
- Forums, mailing lists, chat.
- As it has been previously emphasized, the appearance and clarity of web pages, their easy identification and usability is essential to the success of the site. These requirements can be supported by some of the following aspects:
 - a clear domain name, expressing the official nature of the website;
 - a menu-driven access to services;
 - avoiding unnecessary textual content;
 - drop-down menus appearing as submenus to guide further action.
- Most users click on local government websites or portals with a definite purpose. Therefore, the primary role of portals operated by local governments is to give clear and transparent guidance to visitors even on the main page of the portal, helping them to find quickly the information they are looking for. In terms of content, websites usually offer three major opportunities to facilitate further progress on the site and let users reach the desired function:
 - by selecting the relevant institution or department (links pointing to the website of
 - a given institution);
 - by choosing between topics (or jumping to a thematic webpage consisting of
 - information on tourism, environmental protection or economic issues);
 - by providing a search interface (it usually means a kind of document scanning solution with links to the more advanced topics or an option to narrow down the hits).

In the first two cases, the choice is facilitated in a menu system where a wide range of delivery options are available. Those solutions can be regarded as customer-based ones in which services are not dependent on the organizational structure of the local government, but they are rather connected to those topics that users are familiar with.

In almost all cases, it is possible to reach the specific function only through several steps, on several websites and at several levels. Here, the editors of the site are forced to resolve a serious contradiction: on the one hand, they have to

outline clear options with prompt explanations, on the other hand, they also have ensure that users can find the specific services in fewer steps. Therefore, in order to ensure the optimal number of steps, the main pages of portals are simple in appearance and detailed, thematically- grouped functions are found on them. The topics are frequently grouped at higher levels, for instance they can be grouped on the basis of typical users (eg. life situations, local residents, businesses, visitors).

5.5.4 Content priority

Many users are impatient, they want to get the desired Information at once. They usually read the content of websites quickly, scanning it with their eyes. Their eyes follow a routine, starting from their previous experiences, they only pick the item they really need from the large pool of information, monitoring those parts of websites where the desired piece of information is most likely to appear.

It is still under discussion how users' eyes move when reading the content of a website but Jakob Nielsen's study – published in April, 2006 - showed that users' eyes moved at amazing speeds across the website's words in a pattern that's very different from what we learned in school. They found that users' main reading pattern was fairly consistent across many different sites and tasks. Their dominant reading pattern looked somewhat like a letter 'F' and had the following three components:

- Users first read in a horizontal movement, usually across the upper part of the content area. This initial element forms the F's top bar;
- Next, users move down the page a bit and then read across in a second horizontal movement that typically covers a shorter area than the previous movement. This additional element forms the F's lower bar;
- Finally, users scan the content's left side in a vertical movement. Sometimes this is a fairly slow and systematic scan that appears as a solid stripe on an eyetracking heatmap. Other times users move faster, creating a spottier heatmap. This last element forms the F's stem.

Obviously, users' scan patterns are not always comprised of exactly three parts. Sometimes users will read across a third part of the content, making the pattern look more like an E than an F. Other times they only read across once, making the pattern look like an inverted L (with the crossbar at the top). There can be other variations, of course, depending on the content and users. (for instance, the reversed Z- theory assumes that users' eyes scan first from right to left, then diagonally, then from left to right).

5.5.5 Customer relationship management

Although local government bureaucracy and inefficiency has long been a concern, citizens are growing impatient and demand more for quality service delivery. They want simpler and faster processes, less paperwork, fewer interactions, and more convenience in their exchanges with their local government. Local governments are expanding delivery channels to better address these needs and are now challenged with integrating and consolidating across channels to provide a single view of each citizen's contacts.

In order to provide better and more efficient customer relationship management, citizens' or users' satisfaction can be highly affected by features or applications requiring relatively minor development:

- developing a system that stores all the information on the user's previous visit to the portal, including customized settings, this is usually underpinned by a formal registration;
- widening the range of functions supporting users to know their way around on the website (a clear and easy-to-use system of submenus and drop-down menus);
- providing options for personal contact (telephone, email), sending feedback within 1-2 days so that users feel there is a two-way communication between them and the local government, assuring them that their problems are properly dealt with;
- providing topic-based mailing lists and forums to choose from;
- operating an Integrated document scanning system capable of running a search on institutional servers connected to a network. Offering documents or topics related to the chosen theme;
- highlighting current or important topics (eg. recent legislative changes, regulations, grant opportunities etc.);
- offering functions and services systematically centered around life situations and user groups;
- providing a brief description of optional features and services;
- offering the option of step-by-step implementation of services with the possibility of withdrawing, correcting or cancelling actions;
- checking data entry when filling in an Interactive form by using every possible internal relationship.
- providing personal data protection, data security, confidentiality, privilege control, authentication. After authentication, forms are filled in by automatically downloading existing data from a central database network.

A brief summary of the main points identified in this chapter

- A variety of public goods and services are provided by local governments, including education, public safety, infrastructure, and human services. Many of these services have web-based components with the goal of providing one-stop portals for public services. Local government web portals have received less attention in the e-government literature, but have some of the richest problems. In particular, human services are complex and can benefit much in efficiency and effectiveness of delivery through properly designed and integrated web portals.
- The basic features of portals should be the following: simple, logical and internationally accepted url address in the form of `www.<settlement name>.<country domain code>`, written without accentuated letters; quick download, which is essential if there is a simple web page design (minimizing the amount of animation, images, wallpapers and other promotional items); setting screen resolution to 800x600 (256 colors) as a default, bearing in mind that the majority of users still use older computer configurations; compatibility with the most commonly-used Internet browsers such as Internet Explorer and Firefox.
- Most users click on local government websites or portals with a definite purpose. Therefore, the primary role of portals operated by local governments is to give clear and transparent guidance to visitors even on the main page of the portal, helping them to find quickly the information they are looking for.
- The editors of local government websites are forced to resolve a serious contradiction: on the one hand, they have to outline clear options with prompt explanations, on the other hand, they also have ensure that users can find the specific services in fewer steps.
- Therefore, in order to ensure the optimal number of steps, the main pages of portals are simple in appearance and detailed, thematically-grouped functions are found on them.

A1-1 Basic Priorities

The implementation of the priorities listed below, will facilitate the development of the Digital Local Agenda in the Public Authorities. To see the document of the methodology, please refer to *DLA_General_Format.doc*

1. Automation offices and creation of internal databases

General Description

Without exception, making public administrative decisions need law enforcement. Knowing this essential requirement, decisions can only be automatized if relating laws and regulations are formulated clearly and precisely, furthermore the structure of making decisions is unambiguously defined by the applied laws and regulations. The introduction of automatized decision-making can be advantageous because it significantly reduces the average time of administration processes. The first step in the mechanism of decision-making is to establish the facts and conditions of a case, look for the law or regulation relevant to the case in question and apply it accordingly. If the law gives clear guidance, the decision can be made by algorithms and computers. The automatization stages of decision-making mechanism are the following: making algorithms for 'yes' or 'no' answers in accordance with the criteria required by the law, word processing and programming. The automatization of decision-making mechanisms requires legislation to pay special attention to the possibility of translating the content of applied laws into the language of algorithms.

Finally, apart from carrying out individual work processes and making decisions in an automatized way, the ability to deliver a decision electronically is also a crucial condition from the public authority's point of view. As a consequence, public authorities and local governments have to obtain and use an electronic signature, the signature has to include a timestamp or another authenticated time indicator with an equivalent format.

Requirements

1. In terms of infrastructure development

The infrastructure requirements playing a key role in office computerization and database creation at local governments and municipalities are the following:

- Ø Hardware and software development

- Ø Human resources (Using various databases requires thorough training of the administrators prior to the introductions of such systems. Special attention must be paid to increasing limited team experience and skills relating to the operation of such databases.)
- Ø Organizational changes (Although it must be centered around the office workforce, slight modifications in the organizational structure may be necessary to reach the full potential offered by the applied databases. Varied and sometimes competing stakeholder opinions within the organization must also be taken into consideration.)

2. In terms of funding

Some possible funding sources for office computerization and database creation are shown in the list below:

- Ø European Regional Development Fund
- Ø Donations
- Ø Regional Development Fund
- Ø National Funding
- Ø Other EU funding opportunities to support Information Society

3. In terms of cooperation among the regional actors

Office computerization and database creation at local governments and municipalities **partly requires some involvement of regional actors**. When automatizing office work processes, local governments may consult with IT professionals, businesses specialized in offering IT solutions or exchange their experiences with other local governments on how to implement their automatization plans. **Interoperability is only required on the level of software applications** as there can be numerous ways of implementing efficient Intranet by using various ICT devices. Cooperation between different municipalities is advisable when they plan to connect their databases, in that case they need to agree on common standards, for example, on data exchange. In terms of the assessment of the ICT-capabilities of local governments and municipalities, **office computerization, as a basic requirement for any kind of ICT-based development, does not belong to the group of the most important priorities**.

Importance of office computerization and database creation

Keeping records of information represents one of the greatest challenge for public administration since performing administrative tasks is impossible without registering citizens, organizations, businesses, natural and built infrastructure.

There are numerous and extensive registers, they can be divided into several groups on the aspects presented below.

Based on legal effect, we can make a distinction between:

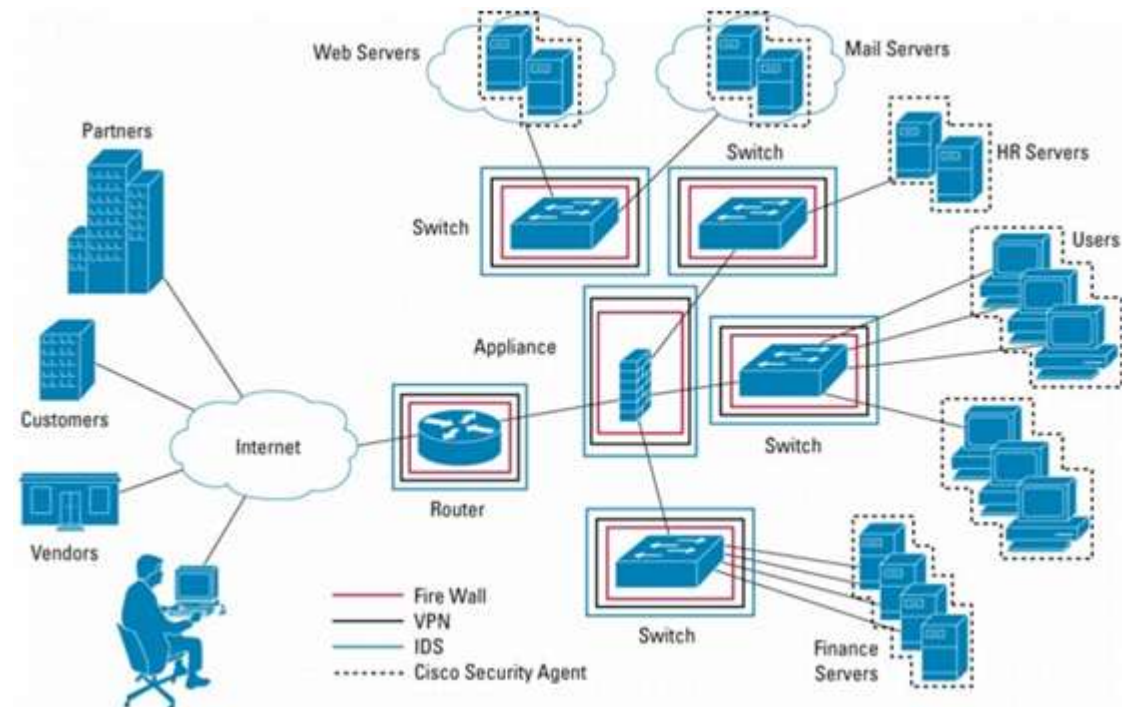
- Registers with constitutive effect where some rights are created, modified or terminated (e.g. property registers);
- Registers with declarative effect where the entries do not create or change any rights, they are one-off declarations of rights instead (e.g. birth certificates).
- Registers can also be defined by their subject:
 - Personal data registers;
 - Asset registers (e.g. real estates, automobiles, public utilities etc.);
 - Intellectual property registers (e.g. patents, inventions etc.).
 - Legislation archives (e.g. legislation records, law draft registrations).
- Based on the kind of administrative bodies:
 - Public administration registers (e.g. property registers at the Treasury Property Directorate);
 - National registers;
 - Sectoral and functional information systems;
 - State Statistical Information System;
 - Local government registers (such as municipal property registers);
 - Mixed registers (e.g. registers of personal information and permanent addresses);
 - Court registers (e.g. business registers).
- In terms of public authentication:
 - Public registers: registers required by law, the information included in them must be accepted by every person as true – unless proven otherwise (e.g. land registers);
 - Non-public registers: a register that is kept advertently by the related public authority or local government, mostly to make their administrative work easier.

2. Network security plan

General Description

In the field of networking, the area of network security consists of the provisions and policies adopted by the network administrator to prevent and monitor unauthorized access, misuse, modification, or denial of the computer network and network-accessible resources. Network Security is the authorization of access to data in a network, which is controlled by the network administrator. Users are assigned an ID and password that allows them access to information and programs within their authority. Network Security covers a variety of

computer networks, both public and private that are used in everyday jobs conducting transactions and communications among businesses, government agencies and individuals. Networks can be private, such as within a company, and others which might be open to public access. Network Security is involved in organization, enterprises, and all other type of institutions. It does as its titles explains, secures the network. Protects and oversees operations being done.



Requirements:

1. In terms of infrastructure development

The main technical requirements for a complete shared infrastructure architecture are:

- Remote access from branch or home locations and the capability to establish a VPN connection to the network when traveling
- Logical isolation of traffic from the appropriate users
- Authentication and logging capabilities
- Accounting, filtering, content checking, and security
- Seamless support for both wired and wireless access

The goals of this architecture are to:

- Identify a user as a guest or employee and assign them to the appropriate segment.
- Isolate the guest traffic from the rest of the network while providing Internet access

Provide network services to enterprise visitors, including the following:

- Network services-DHCP, DNS, and Internet Security services-Firewalls, load balancers, intrusion detection systems (IDSs), accounting, and monitoring

2. In terms of cooperation among the regional actors

It is generally recognized that the best way to manage security risk and compliance requirements is through a systematic and comprehensive approach, based on use of standard applications and infrastructure certified and developed by local Region (i.e. CART for the Tuscany Region). It's important to use open source architecture and software to sharing data:

- Web services
- Server Linux Based
- XML format for the data sharing
- Establish a common protocol for communication

3. In terms of funding

Some funding sources for developing transnational e-government services are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

The key enabler are

- Confidentiality:
The confidentiality issues it's on way to protect the privacy of users, but it cannot be stressed enough that a comprehensive security concept should always include procedures to have a regularly updated, workable, and tested backup in place.
- Authentication:
Authentication is the process of determining the true identity of someone. Basic authentication is simply using a password to verify that you are who you say you are. There are also more complicated and more precise methods such as biometrics (fingerprints, retina scans).
- Authorization:
Authorization is the process an identity management system uses to determine what a user is allowed to do.
- Access control:
Network access control (NAC), also called network admission control, is a method of bolstering the security of a proprietary network by restricting the availability of network resources to endpoint devices that comply with a defined security policy.

Importance (or examples) of Network security plan

The purpose of network security is essentially to prevent loss, through misuse of data. There are a number of potential pitfalls that may arise if network security is not implemented properly. Some of these are:

1. **Breaches of confidentiality:** Each business will identify with the need to keep certain critical information private from competitor eyes.
2. **Data destruction:** Data is a very valuable commodity for individuals and enterprises alike. It is a testament to its importance when the proliferation of backup technology available today is considered. Destruction of data can severely cripple the victim concerned.
3. **Data manipulation:** A system break-in may be easily detectable, as some hackers tend to leave tokens of their accomplishment. However, data manipulation is a more insidious threat than that. Data values can be changed and, while that may not seem to be a serious concern, the significance becomes immediately apparent when financial information is in question.

Main steps for priority's implementation

1. A strong firewall and proxy to keep unwanted people out.
2. Strong antivirus software and Internet Security Software suites.
3. Strong encryption.
4. Whitelist authorized wireless connection, block all else.
5. All network hardware is in secure zones.
6. All hosts should be on a private network that is invisible from the outside.
7. Put web servers in a DMZ, or a firewall from the outside and from the inside.
8. Security fencing to mark perimeter and set wireless range to this.

3. Website Development and stand alone services

General Description

Governmental information and services on the web are typically provided by different organizations as independent web pages, databases, services etc. at different web locations. This creates severe obstacles for citizen end-users. First,

discovery of relevant content is difficult because it requires prior knowledge of the administrative organization providing the contents. Second, the information and service needs often require aggregation of content from several information providers, which is difficult if heterogeneous content is provided by several independent web sites. For example, when a new baby is born, relevant information for the family is provided by health care organizations, social organizations, the church, legal administration, and others. Portals try to ease these problems by collecting content from various organizations into a single site organized according to the clients expected information needs.

Traditionally, a portal denotes a gate, a door, or entrance. In the context of the World Wide Web, it is the next logical step in the evolution to a digital culture. Web pages are not completely self-referential anymore, but allow for personalization, workflow, notification, knowledge management and groupware, infrastructure functionality, and integration of information and applications. The idea of a portal is to collect information from different sources and create a single point of access to information - a library of categorized and personalized content. It is very much the idea of a personalized filter into the web. Portals are often the first page the web browser loads when users get connected to the Web or that users tend to visit as an anchor site. They offer users a surplus value of service based on the features of classic search engines: a well trained concierge who knows where to search and find; a well-assorted newspaper kiosk that keeps the latest market information about the surfer's personal stocks ready; free communications possibilities like email or discussion boards. Thus, the traditional virtual roadhouses -the search engines- become entrance halls, a gateways to the internet, easy, one-stop embarkation points for the daily Web-surfing sessions. The hope behind the idea of a portal: surfer start their voyage into the web in a modern entrance hall, and preferably find their way back to the starting point without major difficulty.

Requirements

1. In terms of infrastructure development

The infrastructure requirements playing a key role in website development at local governments and municipalities are the following:

- Hardware and software development
- Human resources (Developing and changing websites or portal requires thorough training of the administrators prior to the introduction of changes and new features. Special attention must be paid to increasing limited team experience and skills relating to editing the content of the municipal website.)
- Organizational changes (Although it must be centered around the office workforce, slight modifications in the organizational structure may be necessary to reach the full potential offered by a continuously developed

web portal. Varied and sometimes competing stakeholder opinions within the organization must also be taken into consideration.)

2. In terms of funding

Some possible funding sources for website development are shown in the list below:

- European Regional Development Fund
- Donations
- Regional Development Fund
- National Funding
- Other EU funding opportunities to support Information Society

3. In terms of cooperation among the regional actors

Website development at local governments and municipalities **requires only a limited involvement of regional actors**. When developing their own websites or portals, local governments may consult with IT professionals, businesses specialized in offering IT solutions or exchange their experiences with other local governments on how to create more informative and user-friendly websites. Cooperation between different municipalities is advisable when they learn from each-other's good practices and solutions. In terms of the assessment of the ICT-capabilities of local governments and municipalities, **maintaining websites, as a fundamental requirement for any kind of ICT-based development, does not belong to the group of the most important priorities**.

Importance of website development and stand-alone services

The importance of website development cannot be ignored. A variety of public goods and services are provided by local governments, including education, public safety, infrastructure, and human services. Many of these services have web-based components with the goal of providing one-stop portals for public services. Local government web portals have received less attention in the e-government literature, but have some of the richest problems. In particular, human services are complex and can benefit much in efficiency and effectiveness of delivery through properly designed and integrated web portals.

Public administration bodies and local governments need to deploy and maintain thematic portals. These portals need to meet the following basic requirements:

- easy availability;
- customer-oriented, user-friendly interface;

- clarity, simplicity;
- thematically structured features;
- reliable, updated information and services - covering the following four topics in the case of portals run by local governments:
 - information about the settlement, place marketing;
 - institutional information related to the operation of local governments and local government agencies;
 - providing the opportunity to use e-public administration services;
 - business, commercial, civil and other information;
- error-free operation, fast communication;
- content management based on monitoring and evaluating user behaviour;
- data security, protection of personal data;
- providing multilingual content (with regard to tourism, national ethnic minorities and town-twinning);
- compliance with W3C WAI recommendations in the spirit of inclusiveness.

4. Transparency toward citizens on public documents and administrative transparency

General Description

Due to the relationship between transparency and accountability, access to government information is a perpetual concern of citizens. This is conspicuous in municipalities, due to their closeness to citizens and the devolution at local level in many of several government and service delivery responsibilities. The use of information and communication technologies in local governments is becoming more and more widespread. Yet, the potential benefits of ICT implementation at local governments go further than those of promoting efficiency, effectiveness and economy. They can enhance public trust and participation, thus improving the quality of local democracy.

In democratic regimes, citizens' access to information is assured by law and, when this right is at stake, they can resort to special administrative bodies to see it enforced. Yet, this right has limited usefulness unless public sector entities, in effect, do facilitate citizens' access to relevant information, i.e. public entities not only comply with the mandatory disclosures according to the regulations but, above all, do this in a way that encourages citizens' use of the information disclosed. Information should be sufficient so that citizens can know where and how much financial resources are being allocated, and how are they being used (decision-making process). The focus is on the use of ICT as a means to diffuse budgetary and financial information. With the Internet it became much easier for both central and local governments to make the information more publicly available and to improve accountability. It must be noticed anyway that

local governments have essentially invested in the provision of services through the Internet and in the dissemination of general and promotional information, while discarding at some extent the role of Internet as a tool to inform the citizens about the economic and financial administration.

The main aim here is to use the full potential of ICT to provide timely, accurate and easy-to-use information to citizens and other local stakeholders, thus accomplishing the final purpose of increasing general trust in local governments. There have been some efforts to 'open' public institutions, providing more information to citizens, but this information is still very fragmented, often not in the best format for conducting analysis, and sometimes not related to budget preparation and public spending.

Requirements

1. In terms of infrastructure development

The infrastructure requirements playing a key role in creating transparency toward citizens at local governments and municipalities are the following:

- Hardware and software development
- Human resources
- Organizational changes (Although it must be centered around the office workforce, slight modifications in the organizational structure may be necessary to reach the full potential offered by a continuously developed web portal. Varied and sometimes competing stakeholder opinions within the organization must also be taken into consideration.)

2. In terms of funding

Some possible funding sources for creating transparency toward citizens are shown in the list below:

- European Regional Development Fund
- Donations
- Regional Development Fund
- National Funding
- Other EU funding opportunities to support Information Society

3. In terms of cooperation among the regional actors

Creating transparency toward citizens by local governments and municipalities **requires an active involvement of regional actors**. Cooperation between different municipalities is advisable when they learn from each-other's good practices and solutions. In terms of the assessment of the ICT-capabilities of local governments and municipalities, **creating transparency toward citizens is one of the most important priorities in order to make up an open society where e-democracy can reach its adult age**.

Importance of transparency toward citizens on public documents

The following benefits can be brought by enhanced transparency both for local governments and local residents:

Comprehensive - Local governments provide more comprehensive information on a broader range of expenditures, including contracts and subsidies with private parties.

Minimal thresholds or delays - Disclose all expenditures big and small, direct and indirect, with information updated frequently.

Local jurisdictions and authorities - Disclose spending by all local government agencies and entities, including independent authorities.

Contracts - Disclose detailed information for each local government contract, tracking the purpose and performance as well as spending on subcontractors.

Subsidies - Disclose detailed information, including the purpose and outcome of each subsidy. Compile a unified economic development budget to coordinate information about disparate programs. Link disclosure to automatic mechanisms to recapture subsidies if recipients don't deliver on their promises.

One-Stop - Local governments offer one central website where citizens can search all expenditures. A patchwork of disclosure laws provides information about government expenditures – if citizens know where to look. But citizens must access numerous websites, go to several agency offices, read through dense reports, make formal information requests, and figure out complex bureaucratic structures to ascertain what is and isn't included.

One Click Searchable - Commercial internet vendors know that a few extra clicks make it far less likely that users will get to their destination. Local governments have to allow citizens both to browse broad, common-sense categories of government spending and to make directed keyword and field searches.

5. Survey on digital level of other institutions and possible collaboration

General Description

In order to work out their IT development strategy, local governments need to take into account the following aspects:

- Improvement of the level of relationship with other institutions along with enhanced digitization of processes,
- Achieving higher levels of digitization, needed to bring other institutions to more or less the same digital level,
- Linking up with authorities, municipalities, local governments, state institutions that have previously been operating in isolation.

Requirements:

1. In terms of cooperation among the regional actors

Some types of collaboration between other institutions in the course of public administration occur when:

- the client fails to turn to the competent authority,
- the case is so specific that a resolution issued by a different authority must be obtained,
- the scope of duty is outsourced to private companies (for instance in the case of quality certification services),
- legal redress becomes inevitable and contact with secondary authorities is needed,
- administrators have to use databases or registries created and operated by other institutions or authorities so that they can obtain all information necessary to complete their administrative tasks.

When providing public services, public authorities can:

- give access to the electronic information system of other authorities,
- submit a request for providing or copying data from public registries - subject to the conditions laid down in the specific legislation - on behalf of the client,
- ask for issuing official certificates on behalf of the client,
- after the identification of clients, provide them Internet access or other professional help so that they can manage their individual public cases

Importance (or examples) of survey on digital level of other institutions and possible collaboration

During the daily operations, local governments can be involved in the following activities with other institutions:

- Consultation with public authorities performing similar duties, information share, cooperation, coordination of public proceedings, exchange of experiences, mass preparation of resolutions or other official documents with the same content.
- Consultation with central public authorities, request for guidelines, data supply, providing statistics, giving the opportunity to collect information or monitor proceedings,
- Maintaining contact with **other administrative bodies** related to the operation and management of local governments (declaration of taxes, requests for official permits, official announcements etc.)

MAIN STEPS FOR PRIORITY'S IMPLEMENTATION

6. Development of an Intranet, a computer network that uses Internet Protocol technology to securely share any part of an organization's information.

General Description

According to its generally accepted definition, an intranet is a computer network that uses Internet Protocol technology to securely share any part of an organization's information or network operating system within that organization. Contrary to the Internet, which is basically a network between organizations, an intranet refers to a network within an organization. Sometimes the term refers only to the organization's internal website, but may be a more extensive part of the organization's information technology infrastructure. It may host multiple private websites and constitute an important component and focal point of internal communication and collaboration. Any of the well-known Internet protocols may be found in an intranet, such as HTTP (web services), SMTP (e-mail), and FTP (file transfer protocol).

Increasingly, intranets are not only being used to deliver tools and applications, e.g., collaboration to advance productivity but they are also used for more or less the same reasons by governments and municipalities. Intranets are also being used as 'culture-change platforms' that is, large numbers of employees discussing key issues in an intranet forum application could lead to new ideas in management, productivity, quality and other issues.

Among the numerous benefits an intranet provides organizations the following should be highlighted: If all internal information of common interest is accessible via a single intranet, it provides rapid and equal access to information and improves customer service. Self-service access to information, internal administrative services and applications via the intranet contribute to improved knowledge management and staff efficiency. Another key feature of intranet systems is that all relevant content and information are provided in a personalised and secure way, it may also enable home or remote working policies and improving staff efficiency by eliminating geographic location as a barrier to work. As all internal publications, forms and information are available via the intranet, faster turnaround times can be achieved, leading to significant reduction in paper, printing, publication, and distribution and storage costs.

When part of an intranet is made accessible to customers and others outside the organization, that part becomes part of an extranet. Organizations can send private messages through the public network, using special encryption/decryption and other security safeguards to connect one part of their intranet to another.

Requirements

1. In terms of infrastructure development

The infrastructure requirements playing a key role in developing of an Intranet for local governments and municipalities are the following:

- Hardware and software development
- Human resources (Using open source systems such as Linux distributions requires thorough training of the administrators prior to the introductions of such systems. Special attention must be paid to increasing limited team experience and skills relating to intranet.)
- Organizational changes (Although it must be centered around the office workforce, slight modifications in the organizational structure may be necessary to reach the full potential offered by the intranet. Varied and sometimes competing stakeholder opinions within the organization must also be taken into consideration.)

2. In terms of funding

Some possible funding sources for developing intranet solutions for local governments are shown in the list below:

- European Regional Development Fund
- Donations
- Regional Development Fund
- National Funding
- Other EU funding opportunities to support Information Society

3. In terms of cooperation among the regional actors

The development of an Intranet for local governments and municipalities **does not necessarily require the heavy involvement of regional actors**. When introducing an Intranet system, local governments may consult with IT professionals, businesses specialized in offering IT solutions or exchange their experiences with other local governments on how to introduce and operate an Intranet. **Interoperability is only required on the level of software applications** as there can be numerous ways of implementing efficient Intranet by using various ICT devices. Cooperation between different municipalities is advisable when they plan to connect their Intranet systems, in that case they need to agree on common standards, for example, on data exchange. In terms of the assessment of the ICT-capabilities of local governments and municipalities, **developing an Intranet does not belong to the group of the most important priorities. Since all local governments already use such systems, special attention should be paid to questions relating to the efficiency, usability and flexibility of the systems already in use.**

Importance of developing an Intranet

- **It increases workforce productivity:** Intranets can help local government administrators to locate and view information faster and use applications relevant to their roles and responsibilities. With the help of a web browser interface, they can access data held in any database the organization wants to make available, anytime and – restricted by certain security provisions – from anywhere within the organization workstations, increasing administrators' ability to perform their jobs faster, more accurately, and with confidence that they have the right information. It also helps to improve municipality services provided to citizens and businesses.
- **It helps saving up time:** Intranet allows organizations to distribute information to employees on an as-needed basis; it means that within the organization of a local government, administrators may link to relevant

information at their convenience, rather than being distracted from their routine work indiscriminately by electronic mail.

- **It allows more efficient communication:** Intranets can serve as powerful tools for communication within an organization, both vertically and horizontally. From a communications standpoint, intranets are useful to communicate strategic initiatives that have a global reach throughout the organization. The type of information that can easily be conveyed is the purpose of the initiative and what the initiative is aiming to achieve, who is driving the initiative, results achieved to date, and who to speak to for more information. By providing this information on the intranet, local government administrators have the opportunity to keep up-to-date with the strategic focus of the organization.
- **It allows web publishing:** all files and document received or produced by administrators are easily accessed throughout the departments of local governments using hypermedia and common Internet standards (Acrobat files, Flash files, CGI applications). Because each administration department unit can update the online copy of a document, the most recent version is usually available to all administrators using the intranet.
- **It can be used for daily administrative operations and workflow management:** Intranets are also being used as a platform for developing and deploying applications to support administrative operations and decisions across the local government.
- **It is cost-effective:** Users can view information and data via web-browser rather than reading and processing physical documents such as procedure manuals, internal phone list and requisition forms. By reducing the number of paper-based processes and improving the speed of approvals over paper-based administrative processes, this can potentially save the local government money on printing, duplicating documents, and the environment as well as document maintenance overhead.
- **It is designed for enhancing collaboration:** Information is easily accessible by all authorised users, which enables performing better administrative teamwork.
- **It has cross-platform capability:** Standards-compliant web browsers are available for the most important operation systems such as Windows, Mac, and UNIX.
- **It offers Immediate updates:** When dealing with the public in any capacity, laws, specifications, and parameters can change. Intranets make it possible to provide citizens and businesses with instant changes so they are kept up-to-date.

- **It supports a distributed computing architecture:** The intranet can also be linked other existing information management systems of local governments, for example a workflow management system.

7. Open source strategy for development of new products and services

General Description

Within the last 15 years, free / libre and open source software (FLOSS) products have reached a considerable position in the software market. Linux plays an equally strong role as Microsoft in the market of operating systems, and the market for web server software is even dominated by the Apache web server. Open source software is an increasingly attractive option for IT managers in the private as well as in the public sector.

The reasons why open source software are so important, when implemented in regional or local authorities are manifold. They range from cost-effectiveness, increased economic growth and improved flexibility over expiration of maintenance and support through software vendors, increased technical requirements, increased interoperability and independence from software vendors to security aspects and improved reliability.

Surveys on the use of free and open source software have shown that corporate IT managers in the public sector considered higher stability together with operation and administration costs savings as striking advantages of open source over proprietary software.

Another important key for the successful use of the web applications provided by each Regional Authority is the use of server farms (or web clusters). A server farm is a collection of computer servers usually maintained to accomplish server needs for beyond the capability of one machine. Server farms often have backup servers, which can take over the function of primary servers in the event of a primary server failure. Imagine the damage that could be occurred if someone needed to use a service provided by a regional authority (e.g. e-democracy applications like e-voting) and the one and only server the regional authority used was crashed and failed. On the other hand server farms are commonly used as high-speed processors that can efficiently handle with the large scale and numerous applications and services that each Regional Authority provides.

Requirements:

1. In terms of infrastructure development

The infrastructure requirements that play a key role for the effective development of strategies for reuse and open source services are:

- Free and Open Source Software commonly used by Regions
- Internet Access/Broadband Infrastructure for Advanced Digital Services
- Compatibility/Application issues

2. In terms of cooperation among the regional actors

A fundamental key for the common development strategies for reuse, open source and server farms is the cooperation among the regional actors. Local and regional actors have to work together, make appropriate research and finally decide which software they shall use. Regional authorities, institutes for regional development, municipalities and chambers (of commerce, technical, economic etc.) should get together and agree on which open source software and applications are the most suitable for their needs.

3. In terms of funding

Some funding sources for developing strategies for reuse, open source, server farms are listed below:

- ERDF
- FP7 – OSEPA (Open Source software usage by European Public Administration) project
- Donations
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

The key enablers for the implementation and reuse of free and open source software and web farms are primarily the appropriate training on the right use of these applications. All these applications could be accompanied with a “user manual” that could explicitly describe the way the citizens use these applications/services. On the other hand, the regional authorities should be suitably trained for the right understanding of the data that the users/citizens have imported. Additionally, technicians or a trained staff is necessary for the control and maintenance of the web farms.

Importance (or examples) of Open source strategy for development of new products and services

It is very clear how important the adoption of common development strategies for reuse, open source and server farms is. First of all, Open Source means community driven and community serving and the use of such software offers greater independence from companies. Another great benefit is the fact that this kind of software is customizable, which means that the community itself can develop their own add-ons. Other facts that show the great importance the open source software offer include interoperability, transparency and secure. More specific, open source is better for Regional Authorities for economic reasons, better security (there is no need to install anti-virus), independence from western companies and last but not least, such software empowers the e-Governance. Server farms, from the other hand offer greater processing power and security, in case a server fails.

8. Analysis of infrastructural enabling services needed for development of advanced services ICT-based

General Description

Throughout the world, public policies increasingly rely on innovative and interoperable ICT solutions to implement major projects for the benefit of society in domains such as eHealth, efficient energy use, cloud computing, integrated transport systems, smart grids, e-government, e-participation, e-administration etc.

The effectiveness of the proposed solutions depends to a large extent on the level of interoperability between the various ICT components of the systems which in turn depends on the effectiveness and consistency of the set of ICT standards underpinning the application.

Public authorities also count on interoperable ICT solution to be able to communicate with their stakeholders and counterpart authorities both domestically and internationally. To fulfil their policy and communication tasks the necessary interoperable ICT solutions usually have to be acquired through public procurement.

Requirements:

1. In terms of infrastructure development

Some of the fundamental infrastructural services, both hardware and software, are listed below:

- Printers
- Computers
- Structure cabling and Networking
- Telecommunication Solutions
- Servers
- Disaster Prevention Systems
- Provision, Installation and Support Services of Hardware¹

2. In terms of cooperation among the regional actors

A fundamental key for the development of ICT-enabling services is the cooperation among the regional actors. Local and regional actors have to work together to specify which services and of which type shall be enabled in order to develop ICT. Administrations like **regional authorities, institutes for regional development, municipalities and chambers (of commerce, technical chambers, economic chambers, e.t.c.)** have to be willing to adjust all the services they provide in order to enable ICT.

3. In terms of funding

Some funding sources for developing on-line consultation applications are shown in the list below:

- FP7
- ERDF
- Donations
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

Some key enablers that determine the development of infrastructural enabling services needed for development of advanced ICT-based services but also, generally, determine the development of ICT – based services are the follow:

- A committed and adaptive (smart) public policy

ICT-related developments do not develop spontaneously. Each strong ICT-related development was guided, in EU15 national or regional cases, by a strong pro-active public policy push. Strong does not mean centralised or top-down. Rather, the examples show the need for adaptive and committed policies, allowing risk-taking and long-term objectives, and for public authorities to play a coordinating

¹ <http://www.gennetsa.com/>

role. Also, those policies were often seen as holistic — or multi-layered — showing a strong interest in the overall (economic) development of the country, rather than being focused strictly on ICT. They also rely on a broad set of interdepartmental co-operative means. IS policies are seen as being part of the broader category of development policies, covering a variety of domains such as economic development, industrial policy, science and technology, employment, regional policy, innovation policy, education and media. This type of holistic policy seems to have been more possible in countries which had acknowledged domestic crises or which were seeking strong identity building. Pro-activity is another typical feature in these policies, though the risk was high for individual actors because of the level of uncertainty and the apparent necessity for visible individual "champions". Government played a key role in coordinating an on-going learning process and creating predictability for most partners. This was done, for example, by establishing innovative partnerships among actors and by creating clear policy goals and roadmaps.

- Co-opetition frameworks

Co-opetition refers to the search for the right and creative mix of co-operation and competition, through, for example, the co-ordinated meeting of diverse — possibly competing — actors in a goal-focused and time-determined taskforce. This mix aims at creating mutually beneficial situations where providing diversity and generating synergies may help to create common goals and trajectories for all. This concept calls first for innovative institutional arrangements in public policy management, which includes the delegation of decision making and implementation capacity, as well as a citizen/entrepreneur-oriented mindset. Co-opetition frameworks have been used in areas such as infrastructure development for the benefit of the public, a safe digital environment, standards and interoperability, and also education, societal assessments, and democratic and environmental initiatives. Such arrangements also appear to be crucial in cluster development.

- A variety of financing tools

Foreign Direct Investment is a major tool, particularly for funding and developing an ICT (manufacturing) sector. However, venture capital, seed capital, public subsidies and the protection of revenues through adequate regulation (for example, intellectual property rights) are also essential tools to promote domestic development. ICT-related development is an uncertain path that needs considerable trial and error, and also a range of financial tools appropriate to very diverse scales of initiative and risk. This flexibility is important where innovative products and services may start from very different points and involve a wide range of actors.

- Education, info-culture, awareness: The intangible facet

National intangible assets play a major role in fostering ICT potential. Some are demand-side oriented, such as the general educational level of the population and explicit support to creativity and self-learning — in both technical aspects of ICT and also general literacy and infoculture. Others assets lie in facets of the supply chain: R&D capacities, fundamental research and curiosity-oriented research, technology transfer mechanisms, patent regulation and innovation policies.

- Creative use of specific contexts: Alliances by position, language, identity

Geographical position or size may confer on a country a specific role in geopolitics or international trade. Traditional migration flows may reveal unexplored networking capacities as well as access to foreign resources. Language specificity may translate into market access or the affirmation of national identity. Traditional skills may be a hidden attraction. Such features can be embedded in international alliances or in ICT products and services, in marketing behaviour and mobilising visions or in the distribution of managerial responsibilities. Strategic creativity matters more than the hurdles. Addressing these apparent hurdles to ICT-development at national or regional level may reveal opportunities for creating competitive advantages. Not addressing them often turns them into real weaknesses.

- EU policies

EU policies have an important impact on ICT-related development. In most cases, they have supported development both by mandatory regulation frameworks and by awareness raising, direct subsidies or benchmarking initiatives. Reciprocally, EU policies may also generate reverse effects. The focus on the EMU and the stability pact, and on the Enlargement process and its conditions, may have distracted some governments from other priorities.

Bogdanowicz, M., Burgelman, J. Centeno, C., Gourova, E., Carat, G. (2003). Factors of regional/national success in Information Society developments: Information Society strategies for candidate countries. First Monday, 8(10), Retrieved March 1, 2012, from <http://www.frodo.lib.uic.edu>

Importance (or examples) of Analysis of infrastructural enabling services needed for development of advanced services ICT-based

The ICT – enabling services are of highly importance, as ICT itself plays a crucial role in:

- improving competitiveness throughout the economy in the face of globalisation, boosting innovation, creativity and efficiency,
- scientific and technological development in areas as diverse as medicine and physics,

- modernising sectors as diverse as education, security, energy and transport, and making Europe's large public sector more efficient,
- tackling social challenges and improving quality of life while meeting the challenge of an ageing society.

ICT Research & Innovation: a driver for growth, Europe's Information Society, Thematic Portal, Retrieved March 1, 2012, from <http://ec.europa.eu/>

9. ICT skills of PAs

General Description

ICT has played an important role in public administration reforms in many countries. It changes the way the government and the public administration performs its functions and helps reduce operational costs. At the same time, ICT can increase the efficiency of government services. ICT is one of the key instruments that support good governance by increasing government transparency and accountability: this will eventually help reduce corruption opportunities. ICT empowers the general public to actively participate in policy formulation and help ensure transparent use of public funds².

There are several constraints that limit the use of ICT in public sector and one of these is definitely the lack of ICT skills of the personnel. It is essential for every Public Authority to have ICT – skilled personnel in order to update and handle all the information of the ICT – based applications and services available to the citizens. For this reason, there are several seminars and training courses organized by the European Commission (e-skills week) and the United Nations Public Administrations Network.

Requirements:

1. In terms of infrastructure development

In order to improve the ICT skills of PAs, each Public Authority should develop a training program for its employees, which means that appropriate training software or appropriate training classes should be developed.

2. In terms of cooperation among the regional actors

In order to improve the ICT skills of PAs, actors like **regional authorities, institutes for regional development, municipalities and chambers (of**

² ADBInstitute - <http://www.adbi.org/event/286.ict.public.administration/>

commerce, technical chambers, economic chambers, e.t.c.) should work together and conclude to a number of appropriate training software or to a number of training classes that their employees should attend, in order to get better in using ICT and thus to cooperate more efficiently.

3. In terms of funding

Some funding sources for ICT training programs are shown in the list below:

- FP7
- ERDF
- Donations
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

One key enabler for the improvement of ICT skills in PAs is the willingness of the employees to be part of training programs, which will be increased if each Public Authority gives them a motivation. More specific, each PA should inform its employees about the necessity of ICT in modern societies and the benefits of its implementation, which are also strong key enablers.

Importance (or examples) of ICT skills of PAs

The European Union needs to ensure that the knowledge, skills, competence and creativity of the European workforce – including its ICT practitioners – meet the highest global standard and are constantly updated in a process of effective lifelong learning.

- The European Union must remain an attractive place to live and do business.
- It is necessary to continue to work at providing a rich science and technology environment and the availability of a breadth and depth of skilled labour force performing well in the latest technologies³.

Main steps for priority's implementation

As mentioned above, Public Authorities should search about effective training software, which each employee should use in order to personally improve his/her skills. Additionally, Public Authorities should also organize training classes for their employees, in which they could learn the basics about ICT and all the information needed in order to work more effective.

³ Monitoring e-skills Demand and Supply in Europe, Current Situations, Scenarios, and Future Development Forecast until 2015, Costas Andropoulos, Weerner B. Corter,

A1-2 Front office priorities

10. Stand alone services on website

General Description

Stand alone services on web site, is a list of applications and services available to the citizens by entering the Public Authority's website. These particular services promote the e-government, e-participation, e-inclusion and e-democracy initiatives. Citizens can thus participate in public administration's decisions making, exchange opinions, consult the public authority, find information of their interests, use services.

Requirements:

1. In terms of infrastructure development

The requirements in term of infrastructure, in order to develop stand alone services on the website are listed below:

- Use of appropriate hardware and (opensource) software for the development of the services provided to citizens and enterprises,
- Access to the Internet and Use of broadband infrastructure/technology, in order to provide functional and efficient services to the users.

2. In terms of cooperation among the regional actors

In case there is collaboration between local actors in providing services, it is clear that cooperation is required. More specifically, local actors should collaborate and come together, in order to conclude to the number and then to the way of implementation / digitization of the services provided to the citizens. Topics under discussion may be the software that will be used to develop applications, who will implement the applications and clearly who will be responsible for the maintenance and the monitor of the web portal, hosting the services.

3. In terms of funding

Some funding sources are shown in the list below:

- FP7
- ERDF
- Donations
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

The main key factor is to meet the needs of citizens. For this reason, first of all, there should be a phase of public consultation, which will aim to record citizens' views and suggestions. Moreover, the "digitization" of services, along with the functionality and all the benefits (less cost, less bureaucracy, without requiring the physical presence of citizens) should be publicized to the citizens. However, it is clear that the ages and the ICT skills of the users differ, so, for this reason there should be material (video and tutorials) uploaded to the portal, in order to explain, in detail, the procedures for using the services.

Importance (or examples) of the priority

When stand alone services on the website are available:

- citizens participate more actively in local affairs and thus democracy is strengthened,
- the public administration shows interest and faith to the citizens and as a result, their bidirectional relation becomes stronger,
- these online services facilitate the citizens, bypassing those bureaucratic procedures that hamper the service of citizens. As a result, citizens can use the services provided, by entering the web site or by just filling in some applications and forms.

11. Consultation via web to citizens, local enterprises and community organisations on specific issues

General Description

The concept of e-consultation⁴ (on-line public consultation) is a relatively new one and concerns the use of information and communication technologies (ICTs) to enable participation in public consultation. According to ofmdfmi.gov.uk, e-consultation is an online consultation process using the Internet to ask the public their opinion on one or more specific topics and allows for discussion between participants.

E-consultation is the use of electronic computing and communication technologies in consultation processes and is complimentary to existing practices. E-consultation can be an effective tool in encouraging participation and gathering

⁴ www.e-consultation.org

responses to consultation documents and social policy issues as part of a broader range of methodologies.

In the field of Public Authorities (Regional/Local Authorities) the use of on-line consultation of the Public Authorities' Databases (e-consultation) plays a key role in improving the quality, effectiveness and use of the services and applications provided.

According to ofmdfmini.gov.uk, a well run E-consultation has the following advantages:

- It enables people to immediately highlight their views
- It enables people to engage in a discussion which may in turn stimulate further ideas
- It reduces the chill factor of responding to consultations in a traditional written format.

According to UK Department of Business Enterprise and Regulatory Reform, e-consultation can bring a number of benefits, for example:

- the potential to reach, quickly and easily, a wide and diverse audience
- the opportunity for respondents who have little time, to respond interactively to consultations and send their comments on-line, rather than by post
- the opportunity for more informed consultation, by providing access to further information through links to online resources
- the opportunity to filter and analyse responses automatically as they are received electronically
- the opportunity to generate feedback to respondents automatically and to provide them with email alerts when future, similar consultations are launched.

For public bodies, e-consultation offers the benefits below:

- Improvements in the way services are planned, to give users what they want, and expect.
- Help in the prioritisation of services and so make better use of limited resources.
- Help to establish performance standards that are relevant to users' needs.
- Fostering a working partnership between users and staff, so both have an opportunity to understand both the problems and opportunities that exist in the way the service is delivered.
- To ensure that managers are alerted to problems quickly and have a chance to put things right before they escalate.
- To symbolise commitment to be open and accountable: to put the needs of the service user first.

For a successful consultation, the following phases need to be carried out:

1. Pre-consultation planning

- define the objectives of the consultation exercise;
- identify your target audience(s);
- identify how best to reach them;
- prepare the materials – feedback forms, event planning, scripting adverts, designing posters etc.

2. The consultation process

- consultation events – meetings, online forums, workshops, submission forms etc;
- publicity campaign to ensure the public knows how they can take part;
- on-going monitoring of the various aspects of the consultation – ensure that the website is working, the advert appears in the paper etc.

3. Consultation feedback

- provide feedback to the people who participated in the consultation;
- carry out an evaluation of your consultation to identify the areas which worked best, what didn't work so well and why.

Requirements:

1. In terms of infrastructure development

The infrastructure requirements that play a key role for developing on-line consultation of PA databases are:

- Hardware and software development
- Internet Access/Broadband Infrastructure for Advanced Digital Services
- Recruit / Support staff

2. In terms of cooperation among the regional actors

There are three key enablers that determine a successful public consultation, and they are:

- Integrity. Everyone involved should have confidence in the consultor's motivation and the process, even if they do not necessarily achieve the result they desire.
- Visibility is essential to ensure that the process is as accessible to as many stakeholders as possible. You need to tell people what the consultation is about, what the possible implications/outcomes are and why it is important for them to participate.
- Transparency and disclosure obligations are vital (with confidentiality only applying on matters of a personal nature). Consultors must report on all views and responses received and consultees must openly declare differences of opinion. It is important that everybody feels that there is a level playing field and that their opinions will be listened to,

fairly interpreted and then accurately reflected in the final published document which should be made available to participants in an accessible format.

The public e-consultation could be established with the use of⁵:

- online survey or questionnaire
- survey or questionnaire in word or adobe format that must be downloaded, printed out, then mailed to local government
- email address for general, non-structured submissions
- online feedback or comments forms.
- real-time forums or chat rooms.
- public message boards.
- web-casting of meetings.

3. In terms of funding

Some funding sources for developing on-line consultation applications are shown in the list below:

- FP7
- ERDF
- Donations
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

There are three key enablers that determine a successful public consultation, and they are:

- Integrity. Everyone involved should have confidence in the consultor's motivation and the process, even if they do not necessarily achieve the result they desire.
- Visibility is essential to ensure that the process is as accessible to as many stakeholders as possible. You need to tell people what the consultation is about, what the possible implications/outcomes are and why it is important for them to participate.
- Transparency and disclosure obligations are vital (with confidentiality only applying on matters of a personal nature). Consultors must report on all views and responses received and consultees must openly declare differences of opinion. It is important that everybody feels that there is a level playing field and that their opinions will be listened to, fairly interpreted and then accurately reflected in the final published

⁵ <http://www.soaregen.org.uk/>

document which should be made available to participants in an accessible format.

The public e-consultation could be established with the use of⁶:

- online survey or questionnaire
- survey or questionnaire in word or adobe format that must be downloaded, printed out, then mailed to local government
- email address for general, non-structured submissions
- online feedback or comments forms.
- real-time forums or chat rooms.
- public message boards.
- web-casting of meetings.

Importance (or examples) of consultation via web to citizens, local enterprises and community organisations on specific issues

The importance of the online consultation⁷ lies in the fact that it strengthens democracy, as citizens are able to express their opinion and suggest improvements and changes. It also increases accountability, because by linking the public with decision-makers, citizen confidence in and support of the administration is strengthened and so local or regional authorities are held more responsible for their actions. Another reason of the e-consultation importance is that improves policy quality, as active public engagement results in better decisions and better policies and last but not least, the online consultation of PA databases enhances policy legitimacy, as if people are involved in policy deliberation, they will have more faith in the legitimacy of the policy.

Main steps for priority's implementation

The need to provide online consultation in PA databases lies to the fact that it strengthens the relationship between the regional authorities and the citizens, it leads to better quality of services and it broadens the confidence between the public authorities and the citizens.

⁶ <http://www.soaregen.org.uk/>

⁷ BEYOND CIVIL SOCIETY, Public Engagement Alternatives for Canadian Trade Policy, Josh Lerner, University of Toronto, May 2003

12. Extranet with other institutions and development of integrated services (e.g. call center, common databases), workflow management of internal procedures

General Description

Today's business realities are changing the communications landscape, accelerating convergence and integration. For example, the ubiquitous cell phone is no longer just a phone. It has now morphed into an integrated MP3 player, a camera, a camcorder, web browser, text messaging, email, walkie-talkie, a storage media, an authentication device-the capabilities are endless. Likewise, a computer is no longer just a fast computing machine, but a true multimedia endpoint capable of serving as a DVD player/recorder, a VoIP phone, an audio player, a game machine, and even a TV, as well as a work system. Wherever one looks, the trend is obvious-integrated services and applications are being delivered in a smaller form factor, resulting in enhanced productivity and efficiency to the end user.

Requirements:

1. In terms of infrastructure development

The main technical requirements in order to offered as an integrated service or as discrete capabilities are:

- Routing
- Switching
- Secure connectivity: Flexible VPNs
- High-touch security services: Stateful Firewalls, Intrusion Detection/Prevention Services (IDS/IPS), anti-spoofing, Distributed Denial of Service (DDoS) attack mitigation, virus protection, Network Address Translation (NAT), Network Admission Control (NAC), URL filtering, etc
- Collaborative applications: IP telephony, voice-video integration, video conferencing
- Bandwidth and application optimization: Quality of Service (QoS), Bandwidth, and WAN optimization
- Mobility: Wireless applications

2. In terms of cooperation among the regional actors

In terms of cooperation it's important to use a commons application to manage a VOIP services and a videoconference services (i.e. open sources solutions), it's important to use a commons solutions to the authentication and authorization services (i.e. ARPA for the Tuscany region). You must use only HW IEEE compliant for the network implementation

3. In terms of funding

Some funding sources for developing transnational e-government services are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

Public agencies need to coordinate their development of sharing services, in particular it's important to define centralized applications to manage security and streaming traffic (open source solutions). It's also must important define how many services you want sharing with others PA, in order to be able to dimension their networks properly (**In terms of bandwidth**).

Importance (or examples) of Extranet with other institutions and development of integrated services (e.g. call center, common databases), workflow management of internal procedures

- **Improving the Public Administration efficiency** both at internal level (better integration among internal offices) and to citizens, because it make them able to find the same service with the same procedure in different but neighboring territories
- **Maintaining contact and knowledge exchange with other administrative bodies** related to the operation and management of local governments (declaration of taxes, requests for official permits, official announcements, procedure for enterprises etc.)
- **Cost saving and optimization:** facilities, network connections and (sometimes) personnel are shered among more public administration. Redundancies are avoided
- **Wider and better services** for citizens, entrepreneurship, social associations etc.

Main steps for priority's implementation

- Establish which and how many data will be shared
- Establish how many voip and video streaming traffic will be use (it's important for the bandwidth)
- Establish *common rules for the sharing data format*

13. Participation to civic networks / Pilot projects for services with other entities

General Description

Information Society and e.government involve a wide area of topics and services where the creation, distribution, diffusion, use, integration and manipulation of information is a significant economic, political, and cultural activity. The Information and Communication Technologies give the opportunity to connect people and stakeholders in work and information flows so that the same instruments or services can serve and bring together people and entities really different for interests, job, scope. Furthermore the same 'service', by its very nature, may require the contribution of different bodies: in this case ICTs offer a new world of service's opportunity and new concepts for workflow procedures.

In this context local municipalities can take the bridles of this services and coordinate network of entities for launching pilot initiatives and projects focused on creating new services for citizens, entrepreneurship, aged people, etc..

Requirements:

1. In terms of infrastructure development

In terms of infrastructure requirements plays a key role a good level of connectivity among involved stakeholders. According to the different services – which could foresee, for example, a cabled or wireless connection or a lesser/higher security data level - the main technical requirements can be:

- Routing and switching
- Secure connectivity: Flexible VPNs
- High-touch security services: Stateful Firewalls, Intrusion Detection/Prevention Services (IDS/IPS), anti-spoofing, Distributed Denial of Service (DDoS) attack mitigation, virus protection, Network Address Translation (NAT), Network Admission Control (NAC), URL filtering, etc
- Collaborative applications: IP telephony, voice-video integration, video conferencing
- Bandwidth and application optimization: Quality of Service (QoS), Bandwidth, and WAN optimization
- Mobility: Wireless applications
- Databases development

2. In terms of cooperation among the regional actors

Projects and pilot initiatives born among local entities, so cooperation is the crucial node for the final success. Nevertheless lots of possible initiatives can be borrowed by previous experiences and practice already developed and running in other regional contexts. A good service cannot be necessarily a fully innovative one and in many situations recovering and cloning tools and procedure already

successfully working can be the better and lesser expansive solution. Cooperation at regional and local level can be considered also for specific aspect of the initiatives, as, for example, sharing hardware among entities for providing more services or knowledge databases for different information tools etc..

3. In terms of funding

Some funding sources (in addition to the internal resources) for developing transnational e-government services are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

Key factor is the mutual interest and commitment of involved entities in service development: tasks and roles have to be clearly identified before to start and an agreement (concerning also infrastructure development and management) have to be subscribed.

Public agencies need to coordinate their development of sharing services, in particular it's important to define centralized applications to manage security and streaming traffic (open source solutions).

It's finally important define how many services you want sharing with others entities, in order to be able to dimension their networks properly (e.g. in terms of bandwidth).

Importance (or examples) of participation to civic networks / Pilot projects for services with other entities

There is a really wide number of possible running initiatives worthy to be indicated as good practices in this field. According to the theme or the specific need to solve many project are been developed among public institutions, private entity, civic networks etc. aiming to provide services and solution to citizens, workers, enterprises etc..

Followings are only two very different examples.

Theme	E.government for the enterprises
Stakeholders	Local Public Institutions, Agencies for Environment and Public Health, Chambers of Commerce

Final users	SMEs, Industries
Abstract	<p>Providing on line services to enterprises concerning standard administrative procedures and ensuring uniformity in all the regional territory (same procedures, same documentation, same timing, same rules, same instruments etc.). Example of this services:</p> <ul style="list-style-type: none"> - opening, modifying, developing or terminate a commercial activity, - opening and tracking a whatever procedure for obtaining permissions (including environmental certifications) - paying taxes - obtaining general information and documentation (including funding opportunities)

Theme	Services for overtaking the digital gap
Stakeholders	Local Public Institutions, Social and civic networks and associations
Final users	Citizens (e.g. aged people)
Abstract	<p>Creation of Assisted Access Points to Internet and related services for citizens of every age and capability with new technologies where citizens get free connection to Internet and assistance to learn the base instruments of the web thanks to the availability of young dedicated operators.</p> <p>Similar access points could be also exploited for e.participation and e.democracy initiatives related to the local policies cycle of life.</p>

Main steps for priority's implementation

1. **Context analysis** – Before starting, PA needs to duly analyze:
 - a. Survey on digital level of other institutions and possible collaboration
 - b. Status of the ICT distribution and use on the involving territory: who and how can I reach with my initiatives?
 - c. The status of other similar and previously developed initiatives: what has been already done?
 - d. Identification of the needs: what does people want?

2. **Planning** – Finalization of the project architecture with all partner institutions
 - a. Technical and management requirements
 - b. Use cases
3. **Implementation** – Project development
4. **Project assessment and tests** – Monitoring period of the project results and running services with a small number of selected people and stakeholder

14. Interactive services with citizens and SMEs (on-line front offices)

General Description

Interactivity is a functionality rather than a specific type of service, and it can be applied in a wide variety of contexts. Its distinguishing characteristic is the ability of citizen to interact with a digital TV programmes or a web site by one of these methods:

- By changing the content which appears on the screen: for example to access background information, to change camera angles, to view more than one picture at a time, or to view associated text at the same time as a main picture;
- By providing information to the broadcaster through a return path, usually a telephone line: for example to order a product, to exercise "votes" on options provided by a programme or to participate in an on-screen quiz show.
- By change the web site information (i.e. Igoogle)
- By ask a questions to an interactive BOT (artificial intelligence)

Requirements:

1. In terms of infrastructure development

In terms of infrastructures we must integrate a classic tcp/ip network with a digital television and satellite communication. For the integration between network and television we must have:

1. An IP Television (IPTV)
2. A Set top Box to integrate interactive services for the older television
3. Implementation to a MHP protocol to permit the dialogue between web applications and digital/satellite TV

Instead, to implements integrated services inside a tcp/ip network, we must only install an interactive technologies for the web:

1. Web sites with AJAX and FLASH technologies
2. PORTLET Technologies to have a personalized web page for each citizen.
3. Implements a chatbot to simulate an intelligent conversation

2. In terms of cooperation among the regional actors

In terms of cooperation it's important to follow the existent standards to web applications and interactive television

For the web:

1. Respect W3C rules
2. Use only open source applications

For the television:

1. PAL Standard
2. ATSC A/153 Mobile DTV standard

3. In terms of funding

Some funding sources (in addition to the internal resources) for developing transnational e-government services are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Importance (or examples) of Interactive services with citizens and SMEs (on-line front offices)

Interactive Services offers a wide range of multimedia advertising solutions, including print, TV, Internet, mobile and eye Multimedia Service, for both SME clients. Its business activities include:

1. Broadcast and sponsorship advertising;
2. Sponsored segment programming;
3. Interactive advertising and sales transaction facilities, e.g. securities trading;
4. Various directory platforms, such as print yellow pages (yp), Internet yellow pages, Mobile yellow pages, yp Channel 502 on now TV, White Pages, Fax Directory, etc.;
5. TV purchasing facility for product ordering and delivery, e.g. gourmet delivery;
6. Resale of keywords and banners on major websites.

Main steps for priority's implementation

- Establish how many SME are involved in the project
- Establish witch kind of services you want to provide to citizen

- Web Interactive Services
- Digital Television Interactive services

15. Local web portal and multi-channel services

General Description

A web portal or links page is a web site that functions as a point of access to information on the World Wide Web. A portal presents information from diverse sources in a unified way. Apart from the standard search engine feature, web portals offer other services such as e-mail, news, stock prices, information, databases and entertainment. Portals provide a way for enterprises to provide a consistent look and feel with access control and procedures for multiple applications and databases, which otherwise would have been different entities altogether.

Today to create a web portal or to manage his content, we can use applications called CMS (Content Management System). A content management system (CMS) is the collection of procedures used to manage work flow in a collaborative environment. These procedures can be manual or computer-based. The procedures are designed to do the following:

- Allow for a large number of people to contribute to and share stored data
- Control access to data, based on user roles (defining which information users or user groups can view, edit, publish, etc.)
- Aid in easy storage and retrieval of data
- Reduce repetitive duplicate input
- Improve the ease of report writing
- Improve communication between users

On the other hand, during the last decade, users have become accustomed to new means of service delivery in the private sector. Nowadays, users expect the same level of variety from the public sector: they want their interactions to be convenient, and they prefer to be online rather than in line. To meet this expectation, administrations need to deploy a variety of channels for their service delivery – channels that allow users to consume their services anytime, anywhere and anyhow.

New developments in ICT allow the public sector to meet these challenges by adapting their front and back office: new ways of interaction through a variety of channels, restructured services that accommodate their users' needs, and re-organised business processes within and between separate administrative bodies.

The eEurope Action Plan 2005 refers to these developments as follows: "Multi-platforms must enable users to benefit from new technologies and infrastructure improvements such as broadband. Moreover, alternative access platforms will facilitate e-inclusion, also for people with special needs⁸."

Requirements:

1. In terms of infrastructure development

About the development of local web portal the requirements are a server to allow a web portal and a large bandwidth in upload/download.

About the development of multichannel services the requirements are a robust and scalable infrastructure that is capable of sustaining a specific number of e-services. These include the hosting of the government portal as well as all the various interlinked websites, the government intranet, and the availability of a core software library that could facilitate the interfacing of various back-end systems with web-based applications to create veritable dynamic transaction-based public services on-line. Another requirement is a SMS Gateway on the Framework together with other core e-government services such as the payment gateway, which links to corporate databases and imminently the registration and authentication system. The technology used is XML for the transmission of Business-to-Business and Government-to-Business communications. Channels which are now available are the web portal including e-mail, SMS, telephone, and physical (post and in-person).

2. In terms of cooperation among the regional actors

- Define commons procedure at administration level, so as we can use the same applications (web based) for the same procedures.
- Define univocal data sources
- Sharing Data with a standard format (i.e. web services, xml etc.)

3. In terms of funding

Some funding sources (in addition to the internal resources) for developing multichannel services and web portal are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

⁸ Interchange of Data between Administrations. (2004). *Multi-channel delivery of eGovernment services*. Retrieved March 3, 2012 from European Commission: ec.europa.eu

Key enablers

- Define a technology for a web portal (possibly an open source and server independent technology, like JAVA or PHP)
- Define a structure for the web portal

Importance (or examples) of local web portal and multi-channel services

Web portal design is basically the most beneficial access point for the user of the web as they can easily go from one page to another navigating the information of their choices. All the portals have the information stored into links to various topics such as news, business, sports, entertainment, finance, travel and much more.

Some of the user benefits according to the use of multichannel services are the availability on a 24*7 basis, the use of different kinds of contact and services and the most important benefit is that services can be accessed from home or on the move. On the other hand, some of the provider benefits include that this kind of technology is less expensive to operate than the traditional channels, services can be offered to many users at the same time and there is no need of personal contact.

Main steps for priority's implementation

The steps for web's portal implementation are:

- Define a structure to the web portal
- Define a content to the web portal
- Define a medium number of visitors, to size a network
- Define authentication and authorization methods

The main steps for the development of multichannel services are:

Pre-implementation phase

1. Define general objectives, taking into account the priority between user and provider requirements.
2. Decide which services are candidate for multi-channel service provision. Investigate whether the services can be divided into distinct steps, e.g. providing information and responding to inquiries, receiving an application, processing the application, delivering the result.
3. Carry out regional research and segmentation of the customer base to determine the needs and preferences of the various segments of the target group of the service(s).
4. Use the channel selection framework (presented in chapter 5 of this study) to determine the channels to be implemented.

5. Develop a business case and make final decisions on which channels to implement. The business case should at least cover the following issues:
 - objectives;
 - expected results in terms of targets for a certain period (e.g. 1 and/or 2 years) following implementation;
 - investigation and analysis of technical solutions;
 - investigation and analysis of organisation changes (business processes and back and front applications, staffing);
 - implementation path;
 - pricing policies that can influence or change channel usage;
 - quantification of all aspects in terms of costs and time (to obtain costs, possibly consult with potential contractors);
 - evaluation in the light of budget and investment policy (Return on Investment, Net Present Value, etc)

Implementation phase

1. Draw up detailed specifications and possibly develop a prototype. In defining the specifications take into account the possibilities of generic service steps and possible re-use of application components. Use the specifications and the prototype in tender specifications and/or briefing and negotiation with contractors.
2. Obtain the required solution by publishing and awarding a tender or otherwise. Include extensive testing (from the user's perspective) and a pilot phase in the solution development cycle.
3. Carry out awareness creation and promotion to announce the new channel's launch, pointing out benefits to users, etc. Pay attention to web presence (create access from a portal, and include banners and links from other sites). Pay attention to access from search engines. If particular usage patterns need to be changed, do so by means of pricing policies and special promotion activities.
4. Launch the new channel.

Post-implementation phase

1. Perform regular usage monitoring and customer satisfaction assessment. Take special notice of potential exclusion groups.
2. Carry out ongoing promotion to keep drawing users' attention to the new channels and, if required, to decrease the usage of old channels that are to be phased out.
3. Carry out a cost/benefit analysis and assess the outcome in the light of the forecasts made in the business plan.

4. Analyse whether any changes are needed in the implemented solutions, the organisation's business processes or structure or the manner in which the user community is informed.
5. If changes are required, set up an implementation path to realise the changes and determine by means of continued monitoring, assessment and cost/benefit analysis whether the solution is satisfactory or can be optimised⁹.

16. E.participation initiatives

General Description

E-participation is understood as the use of modern Information and Communication Technologies (ICT) in order to involve all parts of society in political decision-making. People have higher expectations as regards the quality and efficiency of public services as well as access to public institutions and elected politicians, but they think that their vote will not "make a difference" or that their concerns and opinions are not being listened to or acted upon. There is great demand for public services and information to be customized to their needs and available at a touch of button, or click of a mouse. Governments and local institutions have to work with citizens to identify and test ways of giving them more of a stake in the policy-shaping process, such as through public consultations on new legislation. ICTs provide a range of tools which can give citizens easier access to information about what decisions are being taken which affect their lives and how the decision-making process works. They can also help foster communication and interaction between politicians and government bodies on the one side, and citizens on the other. Internet, mobile phones and interactive television can be used to channel information to citizens and canvass their views. Increasing transparency and public participation benefits democracy and should improve the quality of legislation being adopted. It is also good for the cohesion of European society because participation promotes a sense of ownership of the political process.

⁹ Interchange of Data between Administrations. (2004). Multi-channel delivery of eGovernment services. Retrieved March 3, 2012 from European Commission: ec.europa.eu

Requirements:

1. In terms of infrastructure development

Although infrastructure requirements play a key role for developing on line consultations, they are very ordinary both in providing than in benefiting of the services:

- Hardware and software development:
 - base level of HW infrastructure (example: the same for the institutional web site)
 - e.services settings for on-line consultations (forum, chat,), opening of dedicated web space on standard social networks
- Internet Access/Broadband Infrastructure for web publishing and Digital Services providing
- Compatibility/Application issues

2. In terms of cooperation among the regional actors

Cooperation with local stakeholders and civic networks is a fundamental key for the success of the consultation. Citizen have to be well informed about what has happening and trustful on a good outcome of own participation. At this purpose, local government have to involve all local representative interested to the selected policy using them – at same time – as controller and partner of the public consultation. Stakeholders could:

- Affect and settle the participation rules (theme, timing, coverage, instruments, etc..)
- Foster the citizen participation
- Monitoring on consultation results and their effects on related policies.

Cooperation at regional level can be important to borrow and share instruments and methodologies for participation, use common standards and extend the consultations in other territory too, so to enhance the importance and the credibility of the local one.

3. In terms of funding

Some funding sources for developing transnational e-government services are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

As for all e.government service/initiatives Public agencies need to coordinate their development of eGovernment services, and agree on basic principles. Interoperability of systems is fundamental together with the use of open source software (greater flexibility and lower costs).

In terms of participation rules it's fundamental to provide clear rule and transparency to citizens. This includes:

1. Mutual authentication of all parties
2. Data authenticity and confidentiality
3. Authorization assuring only eligible citizens participate
4. Participant anonymity
5. Multiple participation prevention
6. Traffic analysis protection to avoid linkages
7. Public verifiability - evidence of fair counting of signatures

Importance (or examples) of E.participation initiatives

A number of tools and models have emerged as part of the Web 2.0 that can be used or inspire the design of architecture for e-participation. In particular, "the emergence of online communities oriented toward the creation of useful products suggests that it may be possible to design socially mediating technology that supports public-government collaborations". Some examples:

Participation tools

- Online social networking: online service, platform, or site that focuses on building and reflecting of social networks or social relations among people, e.g., who share interests and/or activities. Example: Facebook, Twitter.
- Blogs: A **blog** is a type of website or part of a website usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video. Most blogs are interactive, allowing visitors to leave comments and even message each other via widgets on the blogs and it is this interactivity that distinguishes them from other static websites.
- Chats: communication over the Internet, that offers an instantaneous transmission of text-based messages from sender to receiver, hence the delay for visual access to the sent message shall not hamper the flow of communications in any of the directions. Online chat may address as well point-to-point communications as well as multicast communications from one sender to many receivers.

Mechanisms

- eVoting (electronic voting): it can include different level of technology as punched cards, optical scan voting systems and specialized voting kiosks
- Reputation systems, where reputation scores for a set of objects (e.g. services, goods or entities) are computed and published based on opinions collected by participation tools.
- Internet petitions. Petition posted on a website. Visitors to the website in question can add their email addresses or names, and after enough "signatures" have been collected, the resulting letter may be delivered to the subject of the petition, usually via e-mail.
- Transparency tools, *to stimulate e-participation building a relationship trust with the citizens*

Tracking and analysis

- Digital traces
- Data mining
- Data visualization
- Simulations *such as agent-based social simulation*

Main steps for priority's implementation

1. Context analysis – Before starting, PA needs to duly analyze:

- a. The status of the ICT distribution and use on the involving territory: who and how can I reach with my participation initiative?
- b. The status of other similar and previously developed initiatives: what has been already done?
- c. Identification of the participation themes: what does people want?
- d. Identification of social and institutional stakeholders: who does theme involve?

2. Integration of the participation technologies – Strengthening PA hardware and software equipment with existing participation tools, fostering opensource and multichannel tools and aiming to reach the wider number of citizens.

3. Building of the participation process – PA provides the participation rules aiming to clearly indicate the effect of the participation process on the selected policy and giving the full transparency. An example of the participation process:

- a. Identification of the policy subject to the participation process
- b. Identification of the 'actors arena'

- c. Identification of the problems related to the policy and of the possible solution to propose
- d. Indication of the participation channels and tools: institution submits own policy proposal to the citizenship defines the rules of expression: for example setting a time slot for the expressions and providing more channels to collect opinions and feedbacks (email, web, SMS, forum, chat, other), etc..
- e. Creating a trust relationship with citizens and provision of transparency elements: for example at the end of the scheduled time slot, the institution provides a summary of the received feedbacks, shows how the initial proposal is “eventually” changed, outlines the next phases and the full cycle of the policy, etc...
- f. Final choice of the policy solution
- g. Monitoring and sharing of the follow-ups with citizenship

17. Transnational e.government services

General Description

eGovernment is about using the tools and systems made possible by Information and Communication Technologies (ICTs) to provide better public services to citizens and businesses. ICTs are already widely used by government bodies, just as in enterprises, but eGovernment involves much more than just the tools. Effective eGovernment also involves rethinking organisations and processes, and changing behaviour so that public services are delivered more efficiently to the people who need to use them. Implemented well, eGovernment enables all citizens, enterprises and organisations to carry out their business with government more easily, more quickly and at lower cost. In the European Union’s internal market, people are able to move freely – either for work or for private reasons – and consequently they have to be able to deal easily with public services outside their home country more and more, by using transnational e-government services. If eGovernment services are to provide significant added value to citizens and business, then it is crucial that different government bodies, both within a country and in different EU Member States, are able to share information efficiently and co-operate in serving citizens, by developing transnational e-government services.

The reason why the transnational e-government services should be implemented and the benefits that these services offer to the citizens are the follow:

- Transforming public administrations: improving the efficiency of public administrations, reducing their size and cutting costs.
- Putting services online: delivering government services over the Internet and other electronic channels.
- Improving the image of government: increasing the transparency of the public sector and creating a more open, participative decision-making process.
- Increasing government control over society: re-enforcing control over citizens, businesses and taking action against perceived security threats.
- Providing a symbolic direction for society: appear to be modern, working towards progress by following existing technological trends

Requirements:

1. In terms of infrastructure development

The infrastructure requirements that play a key role for developing transnational e-government services are:

- Hardware and software development
- Internet Access/Broadband Infrastructure for Advanced Digital Services
- Compatibility/Application issues

2. In terms of cooperation among the regional actors

A fundamental key for the development and the success of transnational e-government services is the cooperation among the regional actors. Local and regional actors have to work together – to design or procure, and to implement and develop transnational e-government services. The biggest problem with this implementation is not the technology – but getting administrations like regional authorities, institutes for regional development, municipalities and chambers (of commerce, technical chambers, economic chambers, etc.) together and to agree common data systems and standards. Cooperation between different levels and actors of government is important in developing innovative transnational e-governance solutions.

3. In terms of funding

Some funding sources for developing transnational e-government services are shown in the list below:

- ERDF

- Donations
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

Public agencies need to coordinate their development of eGovernment services, and agree on basic principles. Interoperability of systems is fundamental and electronic identities (eID) needs to be recognised by all if they are to replace traditional paper ID cards. Open source software offers governments greater flexibility and lower costs. Without these key enablers in place, the rewards promised by eGovernment will be delayed and may never be fully achieved.

Importance (or examples) of transnational e.government services

A list of services that can be provided with e-government and indicates the importance of the transnational e-government services are :

- Portals and forums (for providing the citizens who live abroad with information about many current issues and news)
- E-government service for birthday certifications (thus facilitating people who live permanently abroad)
- Passport insurance service
- "Announcement of moving" service (for citizens who decide to live permanently abroad)
- Transnational E- health services (for citizens who travel abroad and need to be provided with healthcare services)
- E-Tax payment system (for citizens who live abroad and need to pay their taxes)

Main steps for priority's implementation

The transnational eGovernment services enable all citizens, enterprises and organisations to carry out their business with government more easily, more quickly and at lower cost. In the European Union's internal market, people are able to move freely – either for work or for private reasons – and use all the services offered, even when they travel or live abroad.

Some plan specific actions are listed below:

- Services designed around users' needs and Inclusive services
- Services are designed around users' needs and provide flexible and personalized ways of interacting and performing transactions with public

administrations. (request and receive online civil certificates, submit online tax declarations)

- Use of multiple channels
- Internet, TV, telephone, mobile devices, or where appropriate through intermediaries.

- Collaborative Production of Services
- Social Networking and collaborative tools

- Re-use of public sector Information
- Geographical, Demographic, Statistical, Environmental data which would be available for the citizens in a wide variety of formats and languages in portals.

- Involvement of citizens and businesses in policy-making processes

- Seamless Services for Businesses
- Businesses should be able to sell and provide services and products all across the EU, through easy electronic public procurement and the effective implementation of the Services offering single points of contact to businesses for their interactions with government. (SPOCS, PEPPOL)

- Personal mobility
- Interoperable services enabling citizens to communicate, perform transactions, and send and receive electronic documents and information to and from public administrations across the EU.

- New large scale services based on well-defined needs
- eJustice, eEnvironment

A1-3 Back office priorities

18. Workflow management of internal procedures

General Description

Originally, the concept of workflow has evolved from the notion of process in manufacturing and the office. A process is often defined as a set of partial ordered steps with the purpose of reaching a specific goal. Processes typically consist of process elements which can be further decomposed into atomic process

elements or process steps. It has to be noted that the terms 'workflow' and 'process' are often used as synonyms. In order to describe the characteristics of various workflow management systems, we do not find it necessary to make a distinction between them. Additionally, we use the term 'activity' for describing process elements and the term 'task' for individual process steps.

Workflow management involves the coordinated execution of an administration process, consisting of several activities and tasks which are performed either automatically by an information system or manually by an appointed administrator. Workflow management systems offer an environment to define and execute such processes. According to the workflow reference model suggested by the Workflow Management Coalition (WMC), a workflow management system is a system that completely defines, manages and executes processes through the execution of a software whose order of execution is guided by a computer representation of the process logic. Based on this definition, the following two main areas of workflow management can be identified:

- Workflow specification: requires workflow models and methodologies for capturing a process as a workflow specification.
- Workflow implementation and execution: requires methodologies/technology for using information systems, and human performers to implement, schedule, execute, and control the workflow tasks as described by the workflow specification.

Requirements

1. In terms of infrastructure development

The infrastructure requirements playing a key role in introducing workflow management systems at local governments and municipalities are the following:

- Hardware and software development
- Human resources
- Organizational changes (Although it must be centered around the office workforce, slight modifications in the organizational structure may be necessary to reach the full potential offered by the installed workflow management system. Varied and sometimes competing stakeholder opinions within the organization must also be taken into consideration.)

2. In terms of funding

Some possible funding sources for introducing integrated workflow management systems are shown in the list below:

- European Regional Development Fund
- Donations
- Regional Development Fund
- National Funding
- Other EU funding opportunities to support Information Society

3. In terms of cooperation among the regional actors

The introduction of workflow management systems at local governments and municipalities does not necessarily require the heavy involvement of regional actors. However, when introducing such systems, local governments may consult with IT professionals, businesses specialized in offering IT solutions or exchange their experiences with other local governments on how to introduce and operate it. Interoperability is only required on the level of software applications as there can be numerous ways of implementing efficient Intranet by using various ICT devices. Cooperation between different municipalities is advisable when they plan to connect their Intranet systems; in that case they need to agree on common standards, for example, on data exchange. In terms of the assessment of the ICT-capabilities of local governments and municipalities, **applying workflow management systems belongs to the group of the most important priorities. Since all local governments already use such systems, special attention should be paid to questions relating to the efficiency, usability and flexibility of the systems already in use.**

Importance of workflow management systems

The importance of workflow management systems applied by local governments is unquestionable nowadays. The following advantages of applying such systems can be highlighted:

- Specification: The application of workflow systems has the potential to lead to a better specification of administration processes, of regular (standard) processes and even more of special ad-hoc administrative processes. Even if this is not a technical matter, experience shows that the organizational analysis and design needed to employ workflow systems increases the quality of administrative processes.
- Documentation: the application of workflow systems leads directly to an exact documentation of administrative processes. This integrated

documentation also yields better traceability of processes, built-in status accounting, and improved responsiveness.

- Turn-around: a primary goal for employing workflow systems is to reduce turn-around times and therefore to improve reactivity.
- Flexibility: Comparing to traditional software solutions, workflow systems are much more easier to adapt. They allow a very dynamic and flexible redesign of administration processes to adapt to the needs of public administration. Furthermore, standardized cases or processes as well as non-standard ones can be dealt within the range of one system.
- Integration: workflow systems can act as 'glue' between various ICT devices allowing also the integration of existing systems in newly-formulated administrative processes.

19. Backoffice automation

General Description

BackOffice automation refers to the varied computer machinery and software used to digitally create, collect, store, manipulate, and relay office information needed for accomplishing basic tasks and goals. Raw data storage, electronic transfer, and the management of electronic business information comprise the basic activities of an office automation system.

Generally, there are three basic activities of an office automation system:

- **Storage of raw data:** Data storage usually includes office records and other primary office forms and documents. Data applications involve the capture and editing of a file, image, or spreadsheet.
- **Data exchange:** The exchange of stored and manipulated information is an equally important component of an office automation system. Electronic transfer is a general application area that highlights the exchange of information between more than one user or participant. Electronic sharing software illustrates the collaborative nature of many backoffice automation systems. The distinction between electronic transfer and electronic sharing is subtle but recognizable.
- **Data management:** The last major component of an office automation system offers planning and strategic advantages by simplifying the management of stored information. Task management, tickler systems or reminder systems, and scheduling programs monitor and control various projects and activities within the backoffice.

Within each broad application area, hardware and software combine to fulfill basic functions.

Requirements:

1. In terms of infrastructure development

- In local you must have a server that contains all the functionalities (Applications databases)
- For the network it's necessary to improve the bandwidth

2. In terms of cooperation among the regional actors

- Define commons procedure at administration level, so as we can use the same applications (web based) for the same procedures.
- Define univocal data sources
- Sharing Data with a standard format (i.e. web services, xml etc.)

3. In terms of funding

Some funding sources (in addition to the internal resources) for developing transnational e-government services are shown in the list below:

- ERDF
- Donations or internal resources
- Regional Development Funds (if applicable)
- National Funding
- Other EU funding

Key enablers

- Define commons rules for commons procedures
- Use commons applications for commons procedure
- Use only open source solutions

Importance (or examples) of on line consultations

The backoffice automation permits to reduce inefficiencies to rekeying information, to use manual work arounds, to reduce data loss, and inaccurate reports.

Main steps for priority's implementation

- Migrating your data from different data sources (excel file, text file, access, etc) in to univocal database
- Choice a univocal application for the same procedures
- Choice a *web-based applications for collaborative jobs*
- *Defining a sharing data*

20. Internet usage efficiency

General description

Internet usage efficiency means how efficient do the enterprises or the citizens of a specific territory use the services which are available in public authorities' websites. The 2010 edition of the "EU eGovernment Benchmark Report"¹ shows that availability of online public services is less and less an issue: a wide range of basic services is available in almost all EU27 countries. The use by enterprises has shown an increasing trend. However, the use by citizens remains low and this poses questions and challenges to European policy-makers who want to make the best use of the considerable budget invested until now in digitalizing their public administrations. These questions need answers more than ever in the current time when budgetary pressure due to the ongoing crisis demands best use of available resources¹⁰.

Requirements:

1. In terms of infrastructure development

In order to provide services efficiently, each Public Authority should use technologies that determine security and functionality to the users. As for infrastructure development, every local authority should locate a server with appropriate (open source) software, Antivirus software and Firewalls. In order to achieve an efficient Internet Usage, each Public Authority could develop a team of professional administrators of the web portal, in order to monitor and recover the system, when it is necessary.

2. In terms of cooperation among the regional actors

The cooperation among the regional actors is fundamental, when there are services shared between them. In this case, local stakeholders and authorities should get together and find out ways, in which the use of the services provided could be more efficient.

3. In terms of funding

Some possible funding sources for internet usage efficiency are shown in the list below:

- European Regional Development Fund
- Donations

¹⁰ Digital Agenda Scoreboard 2012 - http://ec.europa.eu/information_society/digital-agenda/scoreboard/docs/2012/scoreboard_eGovernment_trends.pdf

- Regional Development Fund
- National Funding
- Other EU funding opportunities to support Information Society

Key enablers

Some important reasons for not using the internet for interacting for public administrations is the lack of need and that is particularly true, for obvious reasons, for young people and, to a lesser extent, for older people. The second most important reason across all age categories relates to concerns about security of personal data while lack of skills for interacting with the public websites ranks third. This is a clear manifestation of the digital divide: younger generations feel less concerned about the protection of their personal data and/or trust the internet more on that issue. Younger people also find interacting less difficult than their older counterparts. This is of great interest to policy makers since it suggests that the main routes and the key enablers to increasing use of these online services lies in implementing more user-friendly services on one hand, and increasing digital skills of the older (and less educated) citizens on the other hand¹¹.

Importance (or examples)

The importance of using internet services, lies on the fact that such usage

- increases the efficiency,
- decreases cost and time and
- bypasses the bureaucracy

Main steps for priority's implementation

As for the implementation of the priority, first of all each public authority should ensure that the available services, run efficiently and all the data involved in the transactions between the citizens and the authority are secure and protected from unauthorized access. Another key-factor for the internet usage is that the interface of the services should be user – friendly. Next step is the availability of tutorials and videos, with detailed explanation of the steps required, in order to use the services.

¹¹ Digital Agenda Scoreboard 2012 - http://ec.europa.eu/information_society/digital-agenda/scoreboard/docs/2012/scoreboard_eGovernment_trends.pdf

21. Overcoming digital divides (gender, age)

[The Role of e-Governance in Bridging the Digital Divide, Andreea Stoiciu
(<http://www.un.org/wcm/content/site/chronicle/home/archive/issues2011/thedigitaldividend/theroleofegovernanceinbridgingthedigitaldivide>)]

General description

The concept of the digital divide has been evolving over the years, being generally defined as a social issue linked to the different amount of information between those individuals who have access to the information society and information and communication technologies (ICTs) and those who do not. It also refers to countries, regions, cities, and businesses that are at a differentiated socio-economic and cultural level with regard to ICT accessibility. This gap includes imbalances in terms of access to Internet infrastructure, information and knowledge, and equality of opportunity depending on income, race, ethnicity, gender or other similar criteria.

Requirements:

1. In terms of infrastructure development

There should be changes in both education and mentality, as well as investments in e-services. E-governance should play the leading role in creating usable e-government tools, regardless of the level of education. Some governmental websites are very complicated and unfriendly both in access and content. Adopting an integrated and citizen-oriented approach may lead Governments to increase equal opportunities in the use of ICTs.

2. In terms of cooperation among the regional actors

Cooperation between relevant stakeholders in the e-government field, such as central governments, local public authorities, the private sector, academia, civil society, and international organizations is a key factor. These stakeholders should act upon the guidelines within the commitments taken at the Tunis Agenda for the Information Society.¹ The ICT applications and the implementation of e-government strategies, promoting transparency in public administrations and democratic processes, are an important part of the common vision and guiding principles. International collaboration, together with provision of means of implementation, would take us one step further in bridging the digital divide.

3. In terms of funding

Some possible funding sources for internet usage efficiency are shown in the list below:

- European Regional Development Fund
- Donations
- Regional Development Fund

- National Funding
- Other EU funding opportunities to support Information Society

Key enablers

- The key elements in developing e-governance as a defining factor in bridging the digital divide are:
- International, national and regional cooperation.
- Harmonization of the legal framework and regulation.
- Ensuring a minimal package of interconnected and interoperable e-services.
- Promoting ICT skills and digital literacy in a non-discriminative manner.
- Educating and preparing the population of less-developed regions for the Information Society and encouraging e-readiness.
- Running pilot e-services in less-developed regions together with the proper technical assistance.
- Developing e-learning and suitable ICT content.
- Developing e-participation and the inclusion of various social categories in policymaking and decision making, even by using new media technologies, such as social networks.
- Usage of mobile communication as infrastructure for the dissemination of e-services.
- Increasing the transparency in decision making and budget spending by implementing e-services.
- Involving the citizens in all aspects of local and national public administration processes.
- Increasing the quality of life in all its aspects through better e-services and access to knowledge.

Importance (or examples)

In order to gain a sustainable society, Governments and other concerned stakeholders should concentrate on ensuring equal opportunities for the young and future generations. ICT is a vital component of that future, and bridging the digital divide should become a world priority. The provision of suitable e-services and the promotion of digital literacy should become a security matter and a top priority for Governments, in order to ensure their country or region a place in the future knowledge based society.

Main steps for priority's implementation

Governments should play the leading role in enabling creation and deployment of accessible e-services and understandable ICT content. Moreover, they should facilitate the development of a proper and non-discriminative environment for e-government through the regulatory frameworks, strategic directions and Government guarantees. E-governance could become a similar powerful instrument in bridging the gap, such as ensuring affordable broadband² access. New technology could provide easier to use devices such as computers and mobile communication. A good example is a device called "Simputer," which is extremely

easy to use and can be used even by the illiterate. Furthermore, scientists predict that by 2018 the number of mobile phones will equal the world population. These are facts that should awaken Governments all over the world.

The involvement of Governments and suitable e-government tools could become leading actors in bridging the gap. Governmental ICT applications could play a crucial part in diminishing the digital divide between the young and elderly, women and men, the illiterate and the educated, or even between less developed regions and countries. The media, along with the local authorities and academia, can and should be a major tool for efficient and effective communication and dissemination. The Governments of developing countries should raise the priority of e-government applications in their request for international assistance and collaboration as well as international financial support. The next step must be the harmonization of e-government regulations, building and reaching a consensus in the implementation of a basic-kit of interconnected and interoperable e-services.