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INFORMATION AND COMMUNICATION TECHNOLOGY IN HEALTH SERVICES IN ROMANIA

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The concept of Information Society is very large, covering virtually all sectors of the government program. The basic aim is to create a society that includes access to all citizens, increasing the usability of information society services, reforming the government operational models and operational efficiency through appropriate use of information and communication technologies, increasing the competitiveness of the environment that business through advanced use of ITC. The set of national objectives and priorities are based on current needs and realities of Romanian society, while being consistent with the requirements of European, accompanied by funding mechanisms and cooperation mechanisms.

Keywords: Information Society, Health Services, ITC, Information and Communication Technology, e-Government

1. Introduction

Ministry of Communications and Information Society (MCIS) proposes a national strategy, accompanied by an action plan that will lead to no time for the entire public sector orientation toward the information society to the knowledge society, the main instrument of the system e-Government Action .MCIS, single authority as published in organizing and coordinating the implementation of national programs and projects of electronic government and electronic administration (under HG 12/2009), proposes a unified vision to create a coherent and integrated national system for online public services dedicated citizens and businesses.

By transforming the organization and approach of the Ministry of Communications and Information Technology, Government impart a decisive role in guiding Romania towards the knowledge society, the enhancement of the main objective of achieving service e-Romania with e-Government strategic component. Achieving this goal reposition Romania and gives an advantage for sustainable growth, positive international image, rapid convergence in the European space, inclusion, strengthening areas of high competence.

2. Theoretical foundations on I.T.C. fields

To achieve a national system is particularly important to involve all decision makers from central and local public administration and business organization owned and scientific and professional bodies, such as electronic services projects and national applications which propose to MCIS performed in a well-defined, with specific roles and responsibilities.

Achieving goals requires setting strategic directions consistent with the firm taking an adequate legal framework, identifying the components of technical and operational support in accordance with trends and current conditions.

Priority is maximum impact e-Government services, with constant monitoring of how the menus programs implementation services.

Provide administrative and quality government services to citizens, companies and users of central or local government, improve public sector efficiency, reduce costs, simplify operations, increase the number of users is consistent main aims of the strategy and action program, the e-government is the main pillar of the information society and one of the main pillars of the knowledge society.

e-Government

e-Government word literally translates as "electron governance". However, the term e-government has become global in the sense of "State administration through electronic technology".

Signifiance

Overall, e-government is to simplify working modes by applying information and communications technologies in the areas of information management, communication and transactions within and between government and between state and citizens or companies.

Domains

e-Government is classified in the following areas:

- information: The information will be available online such as for example published on the website of the public authority.

- communication: The ability to interactively access and exchange information***.***

- transaction: The actual implementation of services, including signing the application form and electronic delivery of documents and notifications.

Availability

e-Government is a set of electronic services available to all persons in the country. It is also a synonym for a modern and innovative land which, through quality, reliability and speed plays a central role.

Technology

Information and communication technologies (ITC) enable modern public authorities to provide "old" and introduce new ones online. Many of these services effort elude citizens' travel to government offices because the forms can be submitted via the Internet.

Public Service

World Wide Web is practically open round the clock, which means that applications and forms can be sent electronically to public authorities at any time of day or night. e-Government also helps authorities to reach new levels: old procedures and forms are reviewed, updated if necessary, or even eliminated entirely.

Trust and security

Citizens must have confidence in electronic public authority as much as in the traditional. Citizens must be able to verify that the electronic versions of official documents they receive have not been altered and were sent by the authorities.

Transparency

Technical changes will be accepted only if they will be accepted by all concerned, from officials of public authorities and ending with those in business, and whether these changes will be made in a transparent manner.

Accessibility

Services of public authorities should be accessible to everyone without discrimination. E-Government should be available to all segments of the population. Separation between those who are familiar with the use of new technologies and those difficulties should not exist. The solutions offered and yelling Web site must be barrier-free and accessible. Other solutions, such as public Web terminals should give everyone the opportunity to use e-Government.

How to use

Range of electronic services provided should be structured in a way understandable, simple and clear. Navigation and menus should be intuitive and logical, with a familiar structure so that users can quickly find what you are looking for.

Data security

Citizenships granted a high degree of trust administration regarding data protection. Citizens place a high value on protecting their privacy. Personally identifying specific sectors are specially designed to be in compliance with data protection. They make sure that only authorized persons within the administration have access to personal data.

Cooperation

e-Government works best when all levels of government work together, from the smallest local authorities to ministries. Applications and infrastructures will have to work together in order to reach the

desired level of efficiency. Only through cooperation e-Government will work effectively across organizational, financial and administrative.

On the basis of this cooperation are government agencies working together to better present the public.

Durability

e-Government has a modular structure that allows immediate integration of new components in the system to keep pace with the latest technology. The modular structure offers more than durability - it increases the country's ability to compete in the market and strengthens its position as a location for business.

Interoperability

Different types of systems will be able to communicate with each other. Therefore e-Government solutions will be designed in accordance with standards and open interfaces internationally recognized.

MCIS is considering creation of a national electronic system dynamically and continuously updated to streamline the relationship between government and citizen, including information on all areas of economic and social life and include at least one level of information, all existing institutions in Romania at central, regional and local level.

Interoperability is one of the main objectives of MCIS, thus allowing local authorities to develop different levels of digital city or region to implement their own service-level development region, county or city.

By the end of 2013, the citizens, businesses and central and local government will benefit permanently from a defined set of e-Government services, implemented in accordance with clear standards to the highest level of quality and safety is ensured an appropriate pace of growth in the number of users, sustainability services, updating them.

Service quality refers primarily to the user: the time necessary to provide the service, the diversity of means by which the service is provided, the ease with which the service is identified, confidence in using e-service are key indicators of evaluation.

By the end of 2010 the group completed the implementation of basic services that are part of e-Romania simultaneously being built within a sustainable development program.

MCIS proposes a new concept of e-Government – e-Romania based on a common vision of creating a coherent and integrated national system for online public services dedicated citizens, businesses and local and central administration.

Every citizen, whether living in Romania or abroad, every company or government user will be able to inform, to access public services online to solve any administrative problem in the fastest and friendly way.

Electronic services to citizens and businesses will be organized in view, first, the user. In all cases, redesigning processes underlying e-government services will be required before automating them.

Simultaneously, legislation covering e-government will be harmonized to allow quality services, being pursued national policy to increase the quality of the communication infrastructure.

Vision about the e-Government development strategy is aligned with Romania, taking into account the analysis made in the National Strategic Reference Framework and the Operational Programmes.

3. Practical foundations on I.T.C. fields

Providing service e-Romania with e-Government fundamental component is based on four principles that have demonstrated validity:

- **Integration services.** This requires rethinking how various government agents cooperate in providing a service;
- **Unitary approach.** It involves formulating a vision and explicit description of the components: e-service, application, infrastructure, organizational component;
- **Organization.** The program will be coordinated by the Prime Minister, MCIS acting as facilitator, mediator, expert provider, financer;
- **Financing.** We will use various forms of financing: direct financing, co-financing as a legal entity between ministries and between ministries and local administration bodies, public-private partnerships (to the extent possible by law), European Bank or World Bank funding, addressing sources open and/or free private funding.

Objectives are formulated three groups, each group being characteristic of one of the fundamental aspects of e-Government.

The first group concerns the ability of public institutions to harness the potential of electronic services. Fixing these objectives is based on SWOT analysis and data on the preparation for the implementation of electronic services.

The second group of objectives derived from European recommendations or provisions of its own legislation, the priority associated with the provision of services or quality.

The third group of objectives is related to characteristics e-Romania service.

The following objectives are relevant to the creation and provision of electronic governance:

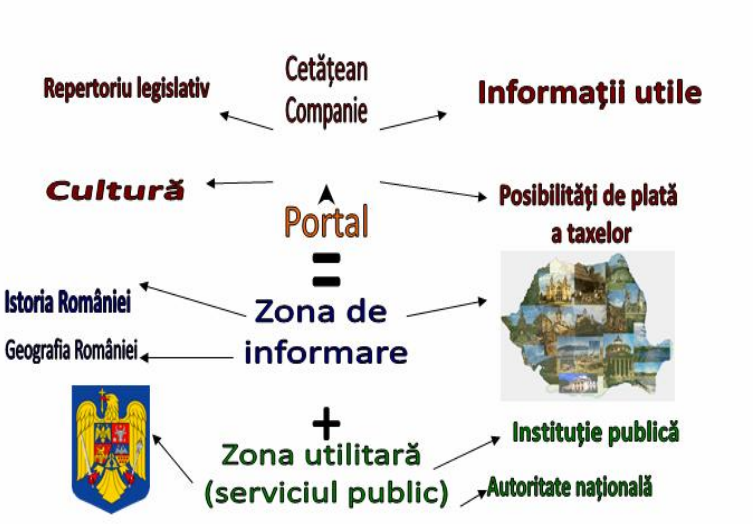
- develop information infrastructure and digital content;
- improve the quality and efficiency of electronic public services;
- increased trust beneficiaries electronic public services;
- collaboration within government;
- development of national e-Government interoperability;
- development of national registers;
- increasing the role of information society means;
- increase performance of public administration employees;
- auditing and certification of quality and performance.

e-Romania portal is expected to be done on two levels:

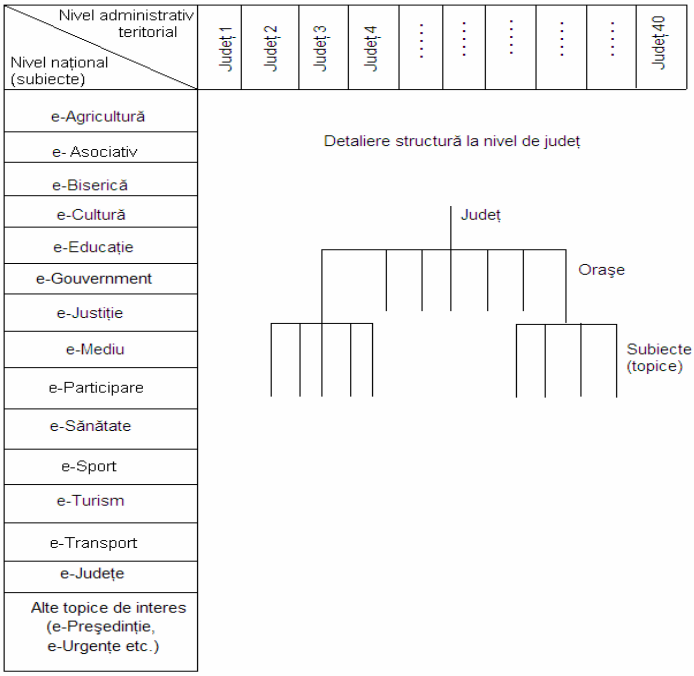
1. **national level** - which includes general information, comprehensive enough to allow transition to another level of detail;
2. **territorial level** - related portals which contain detailed information of interest to the territorial level (county, city).

The main objectives of e-Romania portal are:

- establishing an accurate image of Romania's international;
- increased confidence Romanian citizen to the state and e-government services;
- easy and efficient access to information and public services for citizens;
- increased domestic and international partners trust, while enhancing the attractiveness and competitiveness of Romanian companies;
- create an integrated and interoperable, while decentralizing services;
- reduce administrative costs and efficiency of governance;
- saving time citizen and providing quality services at minimum cost;
- simplification of administrative procedures and decrease bureaucracy.



Structura de principiu a portalului e-România



In order to monitor the implementation of the strategy will be taken into account several indicators of evaluation of actions and results, in order to achieve objectives. These indicators can be found in official EU documents on integration into the single European information. List of indicators and their estimates of the period covered by the strategy are outlined below.

Indicators	The EU average in 2007 (%)	2007 (%)	2010 (%)	2013 (%)
The overall level of sophistication of on-line public services	76	57	85	100
The level of sophistication of on-line public services provided to citizens	70	40	60	90
The level of sophistication of on-line public services provided to business	84	84	90	95
Percentage of total public services available on-line	58	35	60	80
Percentage of total public services available on-line to citizens	51	8	30	50
Percentage of total public services available on-line for business	72	75	85	95
Percentage of on-line "pro-active" (custom)			12	20
Percentage of on-line "pro-active" citizens provided			15	30
Percentage of on-line "pro-active" business provided			10	25
Percentage of on-line income generating			10	25
Percentage of on-line registration			20	50
Percentage of on-line services with general impact			40	80
Coverage of on-line services in urban			60	90
Coverage of on-line services in rural areas			30	60
Percentage of on-line services related to licenses, permits and licenses			10	40
The degree of user guidance services on-line transaction	19	4	10	40
Degree of consistency and integration of national e-government portal		20	30	70

4. I.T.C. systems implemented by Municipal Hospital „Anton Cincu" Tecuci

Currently in the Municipal Hospital „Anton Cincu" Tecuci are functioning more software in order to raise the quality and accuracy of data, namely: **Hospital Manager, Budget Manager, Farmacie Manager, Laborator Manager, Laborator Manager Imagistică, Salary Manager.**

For the purposes of efficient management of data on patients and hospital services provided to them and ensuring strict control over resources was necessary to introduce a unit modern methods through an efficient acquisition.

The implementation of this medical system contributes to the integration and interconnection of all activities in terms of medical and related activities of management and management of the hospital, causing a number of major benefits:

• One of the most important module is the **Hospital Manager**, accessible to all sections of the hospital, which records details of patient presentation and all information about admissions, transfers and discharges. The system generates a unique admission, usable format that attaches barcode patient safety.

• Requests for medical tests and costs are managed by **Laborator Manager** module, it enables sample identification using barcode labels, summarizes the results from all laboratory apparatus allows creating a unique ID analysis provides support for certification in accordance with standard SR ISO 17025.

• Information imaging and associated costs are managed with the module **Laborator Manager Imagistică**, is an effective tool for storing and processing images, records management and radiological imaging examinations performed for each patient.

• Applications are handled by the module medicine **Farmacie Manager** directly from the station for each patient throughout the medication; module manages quantitative value stocks of medicines, list of which is in line with the Ministry of Health and CNAs.

• Information on suppliers, customers, inventory, fixed assets, cash and bank operations, accounting, budgets, contracts are managed through module **Budget Manager**.

• The module **Salary Manager** record and manage the institution's employees, enables the various components entitlements and wages of employees, all specific reports are printed.

Editing system allows a rich set of medical reports, financial and statistical information, each user being able to define and configure functionality and how to view the reports. The system offers the possibility of monthly reports to the preclearance inspection DRG validity data reported by INCDS.

The results of system implementation:

- patient management statement;
- transfer of information and obtaining synthetic data due to the modular structure of the system;
- racking the path of a patient from admission to discharge and implement a complete history by creating a Unique Patient Data Sheets;
- automating the processing and transfer of data and images;
- streamlining the flow of information between departments;
- reducing bureaucratic work submitted by physicians in favor of strictly professional by solving operative issues such as discharges;
- eliminate redundancy information and additional costs in that information is recorded only once and can be accessed from any location;
- get real-time reporting of all necessary internal conduct of business organization and reporting to higher health institutions (eg CNAS);
- DRG can export data directly from the National DRG system application;
- the possibility of implementing customer specific document flow;
- manage, control and efficient allocation of budgets;
- the main purpose of their implementation is to reduce the workload on the preparation of reports and to avoid redundancy in terms of the operation of the primary data, as well as various reporting opportunity on which to take decisions at the institution.

The main benefits for citizens and administration are:

- increase the quality and quantity of medical information by creating an environment of trust information , the information provided and credited by authorized persons ;
- raising the level of medical knowledge , strengthening the link between the patient and the specialist empower the patient to make decisions regarding their health status with your doctor ;
- permissiveness towards information sharing and communication in a standardized way between medical centers ;
- expanding the scope of medical services beyond conventional limits ;
- increased efficiency in the health sector by lowering costs and response time to requests from patients;
- educate physicians using online sources (continuing medical education) and citizens (health education) ;

- improving / maintaining the health of the population through the knowledge and implementation of strategies and methods of prevention ;
- increased transparency in the health system and quality control of medical services.

After project implementation at the national level is estimated following results:

- Increasing the attractiveness of Romania as multinational companies ;
- Encourage investments in effective protection of intellectual property;
- Launch programs to support / encourage purchases of computers;
- Focus on economic activities to increase and decrease in the share of value added activities lohn ;
- Diversification of channels used , including port mobile devices ;
- Facilitating cultural change in the sense of using electronic alternative priority ;
- Insurance costs low Internet services ;
- Providing access to information quickly and discrimination ;
- Increasing economic competitiveness ;
- Provide efficient and quality public services ;
- Development of e-commerce ;
- The creation of new jobs;
- Improved quality of life ;
- Integration in terms of electronic single European information space ;
- Reduce administration costs by 70-90 % ;
- Reduce the efforts of the government in relation to approx. 25-50 % ;
- Eliminate corruption;
- Promoting Romania .

5. Conclusions

Further development of the DRG the system is not a fashion but a necessity of the health system. Demographic changes, technological changes, introducing new procedures, changes in general economic, functional modifications and management of hospitals etc. are cases that require constant adaptation to the DRG system. For this is mandatory however the existence of effective mechanisms for continuous communication with hospitals to understand the reality of their activities, capacity building and creative response of the central institutions involved in the functioning of the DRG system (SNSPMPDSB, CNAS, Ministry of Health etc.), Ensuring continuation among human resources involved in the system development, development of new structures with a role in highlighting and updating of clinical changes, etc. costing and DRG the system integration with other activities and direction of change induced by permanent reform of the system health.

Results of the research reveal the deficiencies of actual financing system and show how this can be improved using real cost data from Romanian hospital setting. The suggested model of financing based on standard costs per type of patients (DRGs) presents a number of important advantages and benefits on more dimensions such as:

1. Identifies the package of services for a given diagnosis or type of patient. At present, hospitals treating same type of patients are, methodologically speaking, equally reimbursed (by means of the same tariff per weighted case) by the insurance house, although services actually delivered to patients may be different in volume and/or quality.

2. Identifies costs of services per type of patient, which can be used for modeling reimbursement tariffs by the insurance house. Knowing the cost of services also helps in building prices for services contracted with private insurers or other external buyers.

3. Shows the efficiency of hospital activity in the contractual relationship with the insurance house, by comparing revenue per case with the cost per case treated; it helps to identify which services can be subcontracted with other providers (outsourcing) for efficiency gains and identifies new opportunities for public-private partnerships.

4. Allows for cost control and control of organization's performance. Based on information obtained from managerial accounting and costs, the hospital may identify and develop those services which are profitable, and resize the non-value-added activities.

5. Reengineering of process flows and clinical management. The ongoing benchmarking with own standard of care allows for improving care processes, reorganize activities and perform a better clinical management; allows for identification of medical errors and provides a basis for proactively preventing them.

6. Improvement of quality of services and patient satisfaction. The use of care pathways enhances improvement in quality of care and increases communication among professionals and with patients.

7. Promotes an "open" organizational culture. Care pathways utilization creates good premises for improvement of multidisciplinary team work and helps in understanding responsibilities, and in providing integrated care by all personnel involved.

8. Instrument of internal control. Since care pathways reflect actual hospital standards in providing care, all variances from agreed standards are documented and discussed among professionals and with the management. Care pathways may be audited by the insurance house once integrated in clinical practice and in the contracts for services delivery.

9. Protection against malpraxis. The degree of conformity of clinical practice to the agreed protocol or care pathway may offer protection to clinicians against complaints, and helps them in preserving the standards of care.

10. Reform of healthcare system from "inside". The model offers a basis for multiple actions in the areas of financing, cost control, quality of services, European standards of care, organizational culture, patient safety and patient satisfaction. In Romania we have a system problem, which, according to systems theory ("system problems require system solutions"), should be addressed by concomitant actions in all of the areas mentioned above. There is no single instrument able to provide the right solution to all problems. However, for all reasons here discussed we can start using care pathways.

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