



THE MECHANISMS OF E-MANAGEMENT IN DEVELOPING PUBLIC HEALTH SERVICES

BENMALEK Ismahane *

Faculty of law and political science

University Mohamed el bachir el ibrahimi of bordj bou arreridj Algeria

ismahane.benmalek@univ-bba.dz

Cyber justice Laboratory

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Abstract:

The entire world has entered an advanced stage within the horizons of the information age, leading to the emergence of new concepts in the field of management, including e-management. This concept aims to develop traditional business models to achieve optimal investment and create new opportunities by taking advantage of information and communication technologies (ICT) as a strategic tool to improve the quality of health services.

The objective of this study is to explore the contribution of e-management in enhancing health services in public hospitals. It also seeks to identify the characteristics and goals of e-management, its significance in improving services in hospitals, as well as the main challenges and obstacles that hinder the advancement of public health services.

key words: E-management, information technologies, health services, public health.

Introduction:

The transition to e-government is an imperative necessity driven by global changes, so the rapid development of information and communication technologies has become a double-edged sword, reflecting on public administration and the development of services provided. In public organisations in general, and in health organisations in particular, a number of

* BENMALEK Ismahane

additions have been made that have radically changed all administrative and organisational tasks. In spite of all the organisational and legislative methods proposed by the digital revolution, especially in developed countries, e-government has faced many difficulties and challenges that differ in appearance and essence due to the nature of the information technology challenges that have changed the pattern of relationships between people at local and international levels.

Therefore, in this study we will try to shed light on the role of e-government in improving the performance of health services in public hospitals by addressing a series of elements that allow us to become familiar with the concepts and applications of e-government and its contribution to the advancement of health service performance.

Importance of the study:

The importance of the research lies in knowing the positive effects of e-government, which have allowed the improvement of the efficiency and effectiveness of performance, which traditional (paper) management has not distinguished, especially in the health sector.

Objectives of the study:

This study aims to achieve a number of objectives, the most important of which are:

- To clarify the theoretical concepts of electronic management.
- To identify the principles of implementation of electronic management.
- To recognise the contributions of electronic management to improving the performance of health services.

Research problem:

Based on the above, the research problem focuses on:



To what extent has electronic management contributed to improving the performance of public health services?

Methodology:

In order to achieve the objective and address it from various dimensions and aspects, and to clarify its purpose, the descriptive and analytical approach was adopted to process various information in an objective scientific manner to achieve scientific results.

Outline of the study:

First Axis: The Nature of Electronic Management.

Second Axis: The role of electronic management in improving health service performance.

Third Axis: The Impact of Implementing Electronic Management in Healthcare Institutions.

1- The concept of electronic management:

It is a management strategy for the Information Age, aimed at achieving better services for citizens, institutions and their clients, with the optimal use of available information resources, through the use of available human and moral resources within a modern electronic framework, in order to make the best use of time, money and effort, and to achieve the targeted requirements with the required quality (Mostafa, 2011).

“Peter Drucker” believes that the work of management requires reminding and preparing to define goals and values, and it also requires the development and evolution of the institution and its members to bring about changes in needs and opportunities (issat, 2013).

It is a system of business and activities carried out electronically and through networks, that is, through the use of organisation and

electronic means, such as integrated long-distance networks, the Internet and computers by government agencies (Mostafa, 2011).

According to this broad definition, e-government is not limited to the mere provision of services to citizens via the Internet. Rather, it encompasses the continuous effort to achieve the highest quality of government services through unconventional electronic means, both internally and externally, at any time and place, without discrimination and ensuring equal opportunities.

Some define it as a set of government activities that rely on the Internet and electronic communications across all tiers and levels of government to deliver all services and transactions to individuals and to provide information in various areas in an easy and convenient manner (Al-Metawalli, 2003).

The World Bank defines e-governance as “a modern term that refers to the use of information and communication technologies to increase the efficiency, effectiveness, transparency and accountability of government in providing services to citizens and businesses, empowering them with information, supporting all government business systems, eliminating corruption, and enabling citizens to participate in all stages of the policy process and related decisions that affect various aspects of their lives (Al-Aloush, 2004).

This definition is situated within the World Bank’s guiding framework for the principles of good governance, considering e-government as one of the applicable means.

The definition adopted by the European Union is that e-government is “a government that uses information and communication technologies to enable citizens and businesses to interact and communicate with the government using various communication methods such as telephones, faxes, smart cards, kiosks, e-mail and the Internet. It relates to how government organises itself in terms of administration, laws and regulations,



and provides a framework for improving and coordinating service delivery and achieving integration between processes.

According to some researchers, e-government can be defined as “the ability of government agencies to exchange information with each other and to provide services to citizens and the public sector quickly and at low cost over Internet networks, while ensuring the confidentiality and security of the information transmitted at any time and in any place” (Jaber, 2002).

Some see eGovernment from a technical and social perspective, as a technical system used to serve the community effectively. Accordingly, e-government means reinventing government business and procedures through new methods of integrating and accessing information through the Web site and participating in the process of purchasing and delivering the service.

2_definition of health institutions

Before looking at the definition of health institutions, it is necessary to discuss organisation, of which health institutions are one of many types. Organisation is an administrative process of grouping tasks, systems and functions into departments or divisions, defining authorities and responsibilities, and coordinating between departments to achieve the organisation’s objectives as efficiently as possible (Rabia, 2017).

Health care institutions, as one of the service organisations, are those institutions that provide health care directly, such as hospitals, health centres, clinics and specialised centres, or indirectly, such as laboratories and health administrations with supporting services and medical maintenance (Nayaz, 2005).

The World Health Organization defines it from a functional point of view as an integral part of the social and health organisation that works to provide both curative and preventive health care to individuals (Jalda, 2007).

A health institution is a unit or organisation that provides both curative and preventive services, and is divided into curative health institutions, such as hospitals, clinics and health centres, and preventive health institutions, such as maternal and child health centres and school health centres.

3- The concept of public service:

It is a set of activities provided by the state or the official entity in a country for the general public or citizens without discrimination, based on achieving the public good for all. It refers to the general population and does not concern one group more than another. The state, with its various institutions such as ministries, authorities, local councils, police stations and courts, is responsible for any shortcomings in its provision. It is an official task and a service for which the State does not always receive payment (Mishaala).

4- Principles and Objectives of E-Government:

4.1- Principles of E-Government:

The most important principles of e-government can be summarized as follows:

1: Providing the best services to citizens. Caring for the citizen's service requires creating a work environment with diverse skills and competencies that are professionally prepared to use modern technology, because administration always focuses on employing information, extracting results, proposing appropriate solutions for each problem, and properly exploiting them in the e-government environment.

2: Focusing on results, i.e., the concern of e-government should be centered on converting ideas into tangible results on the ground, because citizens are not much interested in the work philosophy or flashy slogans, but what matters most to them is



providing proof and actual evidence of the validity of the electronic process and the emergence of its results in the field. For example, if we say that technology was utilized in Germany and Japan before World War II, the collapse and defeat of the two countries in the war came to show that technology was indeed complicit in the countries, and that Germany and Japan regained their strength in less than half a century (Al-Aloush, 2004).

3: Continuous change, which is a fundamental principle in e-government, as it regularly seeks to improve and enrich what exists and raise the level of performance, either with the aim of satisfying customers or with the aim of excelling in the field of competition. In all cases, the customer is the primary beneficiary of this continuous and ongoing improvement (Al-Aloush, 2004).

4.2 Objectives of e-government:

Based on the above, we can state that the general objectives of e-government can be summarised as follows:

1. To bring about a change in government procedures by providing government services faster and at lower cost (Al-Aloush, 2004).

2. To develop the system of government and public affairs and to create a new relationship between citizens and the state in the management of state affairs through the following three components

- The process of gathering information as a basis for policy development and disseminating the results of policy consultations to citizens.

- The use of electronic information systems to facilitate the process of participation and dialogue in policy development, priority setting and strategic guidance for the state.

- At an advanced stage, the use of electronic information systems in the electoral process and political representation.

3. Creating efficiency in administration and improving the level of administrative processes through the use of modern technologies.

4. Reorganisation of administrative work and qualification of human resources and training in the use of modern technologies.

5. Rationalising decisions related to government work and reducing duplication in complex procedures.

6. Filtering information and selecting what is useful for implementing promising initiatives.

7. Reduce the burden on citizens and the effort required to complete transactions.

8. Reduce bureaucratic constraints and the amount of paperwork required to complete transactions.

9. Simplify and streamline administrative procedures, increasing transparency and clarity.

5- Characteristics of e-management:

E-management has several important characteristics:

5.1 Paperless management:

By relying primarily on computers and minimising the use of paper (Deggi, 2016), e-management consists of an electronic archive, e-mail, electronic schedulers, voice messaging and automated follow-up application systems.

5.2 Remote management:

In addition to remote working, e-government makes use of technological means or modern communication tools such as mobile phones, new international phones and electronic conferencing. The manager can take decisions from anywhere in the world without being physically present on the premises of the public institution. This requires a high degree of flexibility, allowing the manager to monitor the activities of his or her department, intervene remotely to resolve emergencies, and make



appropriate decisions even from home. This is a crucial mechanism to bring the administration closer to the citizen and to improve public services without the citizen having to visit the service premises to request a service.

5.3 Time-independent administration:

This service is available around the clock, throughout the week, month and year, without being constrained by specific time limits (i.e. 24 hours/7 days/12 months/365 days).

5.4 Evolving management:

E-management operates on advanced programs and systems, moving away from rigid organisational structures through network institutions and intelligent institutions based on knowledge creation (El-Walid, 2014).

5.5 Mobile management:

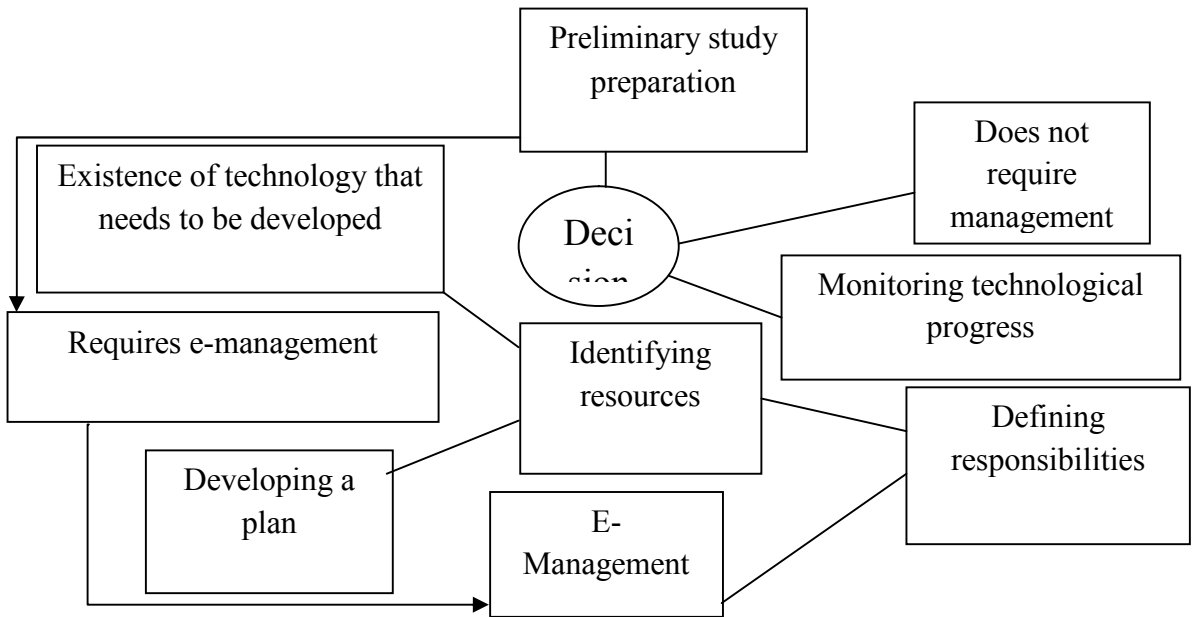
This e-management represents a modern mechanism in administrative development and organisational change processes, marking an important turning point in the shape of traditional administrative tasks and activities. It involves the immediate processing of requests, complete accuracy and full clarity in the completion of transactions.

6. Embodiment of transparency:

This feature is considered the most important characteristic of e-government, resulting from the existence of electronic control that ensures periodic accountability of all services provided, and transparency in the bridge between citizens and civil society institutions on the one hand, and the authorities responsible for administrative tasks on the other, especially in the health sector, which is an important sector where all citizens must be treated equally regardless of their level, gender or experience. This creates trust in the minds of citizens and leads to complete

clarity, away from suspicion. E-government supports transparency and achieves this premise, which directly reduces administrative corruption.

Steps to implement e-government (Alaa Al-Salmi, 2008)



The Second Axis: The Role of Electronic Management in Improving Health Service Performance:

The health institution is considered one of the most important institutions that cannot do without modern technology, which provides it with many advantages and benefits, especially in improving health management by saving effort, time and costs, in addition to improving the provided health service.

1- Elements of the electronic health information system:

The information system is based on systems that extract information from data effectively and efficiently, and it consists of two main elements:



1.1- The people who collect and analyse data and information:

These people must have a number of conditions, the most important of which are:

- The ability to analyse electronic information.
- A deep understanding of the components of the information system.
- Understanding and interpreting the different models that represent the information specific to the health institution.
- Responsibility for the maintenance of the equipment used.

1.2- Data:

- Statistical tools for data analysis.
- Appropriate data for the specific work environment.
- Different forecasting models.

Information is an important tool in health institutions, without which appropriate decisions cannot be made. Given the importance of information systems in improving health and organisational performance in health care institutions, health information must meet many specifications, such as being documented, unbiased, quantifiable, available in a timely manner, and having a high level of accuracy, comprehensiveness, and clarity. These are standards by which the value of health information is determined, as they are directly related to the extent to which it meets the needs of its users. The higher the value, the better the information meets those needs (Othman Al-Kilani, 2022).

2- The importance of the electronic information system in health care institutions:

Electronic information plays an important role in health care institutions, as evidenced by the following:

- Health data, information and statistics enable performance evaluation through a detailed examination of the available data, which can shed light on the efficiency of health, therapeutic and administrative activities in health institutions (Othman Al-Kilani, 2022).

- Health statistical data and information are used to evaluate performance through a detailed examination of the available data, which can shed light on the efficiency of health care, therapeutic and administrative activities in health care institutions (Othman Al-Kilani, 2022).

- The electronic health statistical information in the health institution enables proper budgeting, as this sound data can lead us to the most appropriate performance rates, resulting in the accurate determination of material and human capabilities.

- The provision of information to the different levels of administration, as required, in order to carry out their functions of planning, organisation and control.

- The use of medical and therapeutic statistical data in health care institutions for the proper preparation of budgets, showing the most appropriate performance rates and leading to the accurate determination of the material and human capabilities on which the budget is based.

- The ability of electronic information to connect the subsystems of the health institution in an integrated system, which allows the verification of data and information between these systems and the achievement of coordination between their various activities, such as the Internet and e-mail (Al-Shawabkeh, 2011).

- Carrying out the process of controlling the circulation of various data containers in the healthcare institution, such as forms, documents and records.

The process of service improvement in health care institutions is largely dependent on electronic and statistical data, whether within the health care institution or externally. These data allow



the evaluation of the efficiency of services through the following comparisons:

1. Comparing the performance of the healthcare institution over successive periods of time, taking into account factors of change and development.

2. Comparing the institution's performance with that of a similar institution, whether within the same governorate, nationally or internationally, taking into account the similarity of certain conditions.

3. The use of electronic and statistical health data in the field of calculating the economics of health services, including the cost of health services, cost centres, as well as the economic savings resulting from the elimination of chronic and infectious diseases, which leads to increased productivity and consequently increased national income.

4. The availability of medical record data in the healthcare institution can lead to the achievement of the highest level of required patient care. The primary objective of this data is to contribute to better patient care (Al-Souaisi, 2012).

3- Electronic management requirements for improving the performance of health services:

To achieve the required objectives of electronic management, it is first necessary to prepare the appropriate environment for the nature of its work, since electronic management is affected by all elements of the surrounding environment and interacts with all political, economic, social, cultural and technological elements. The most important of these are:

- The need to provide means of communication and electronic software.
- Providing an infrastructure that includes a modern communication network capable of ensuring communication and

information transfer between the hospital administration and the authorities and the public (Bayoumi, 2008).

- Work to train and educate staff and the medical team to manage and direct electronic management correctly.
- Work to provide sufficient funding for the electronic management project.
- Provide political will through the development of general government policies for the proper application of sound electronic management.
- Work to find and enact the necessary legislation to facilitate the work of electronic management and give it credibility.
- Work to ensure electronic security and electronic confidentiality to protect information.

In order to ensure the proper implementation of electronic management, the following must be provided:

- The electronic structure: This is the structure of the electronic management network, based on an advanced technical and information base.

Digital technology: This refers to the basic technological mechanisms such as computers, the Internet and information and communication technologies, which are based on a set of management mechanisms, the most important of which are reengineering, benchmarking, strategic planning and quality (Al-Salmi, 2001).

Electronic strategy: This involves electronic thinking, determining the priorities of health institutions and identifying the core capabilities to implement these conclusions, as well as promoting a culture of participative work, sharing information and knowledge, and coordination among staff to improve service performance.

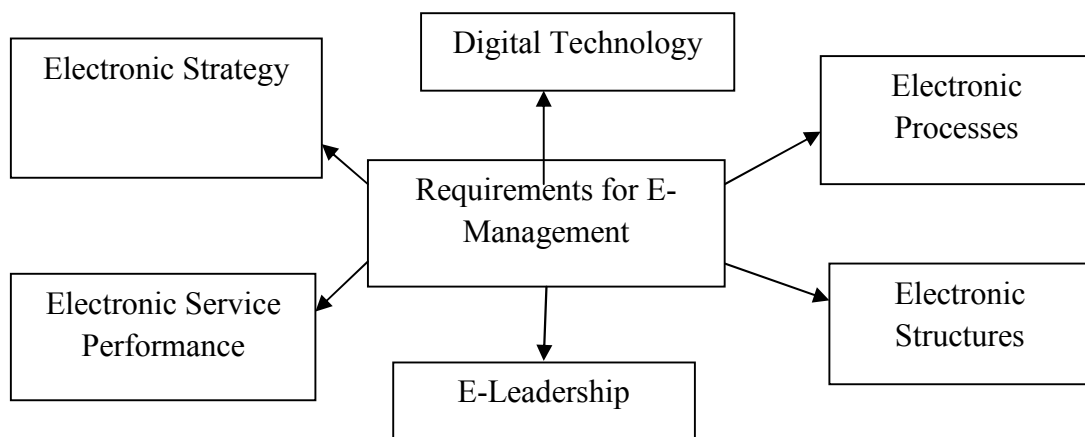
Electronic processes: These are a set of efforts to redesign administrative work through the use of information technology tools and organisation.



Improving the performance of administrative services: To ensure the satisfaction of beneficiaries' needs through a thorough and effective analysis of their needs, identified through various electronic relationships of health institutions.

Electronic management: This refers to the skills and ability to innovate and apply knowledge (Aboud, 2004).

The six requirements of electronic management:



The process of improving public health services is not a new concept, as large companies and institutions around the world have been using it for years to improve their work performance. Improving service performance, especially in the health sector, is a fundamental factor of modern management, which aims to improve work processes by defining goals and objectives, defining conclusions and removing all existing obstacles that affect the workflow. This is done by using technological means to develop management in a way that responds to the needs of the beneficiaries of its services. Improving the performance of health services has become an essential necessity in modern management, leading to positive results in the improvement of service performance, including

- Finding definitive solutions to existing work problems, whether for the employee or the service user.

- Satisfying the beneficiaries of the services and improving their performance.
- The ability to rationalise expenditure and improve services through the effective use of information technology and resources.
- Periodically develop new measurement systems.
- Build and train new highly effective skills.
- Training and forming a new behaviour of the working staff, based on the interest in the development and continuous improvement of the work performance.
- Reducing time, effort and money for both employees and beneficiaries of the administration's services.

3- Impact of the implementation of electronic management in healthcare institutions:

3.1- Advantages of Electronic Management in Healthcare Institutions:

3.1.1- Advantages provided to the community:

- Contributes to increasing the transparency of governments in improving services, simplifying procedures and facilitating transactions between them and all segments of society.
- Contributes to providing accurate data and information and making it available to all segments of society.
- Helps to present the procedures for obtaining government services and their forms in a way that makes it easier to deal with organisations.
- Leads to the opening of a new channel of communication between different segments of society (Jalda S. B., 2007).

3.1.2- Benefits for citizens:

- Allows citizens to find information and obtain services in their place of residence without the need for personal presence.



- Helps to increase customer loyalty and quick response to needs and easy delivery of services provided to them.
- Ensuring the quality and accuracy of the services provided by subjecting the electronic performance to a more precise control than that imposed on the employee in traditional administration, thus contributing to a better service performance and less use of administrative capacity (Jalda S. B., 2007).
- Elimination of bureaucracy and administrative corruption, as service delivery in e-government is based on the principle of justice and equality in the provision of services to citizens.

3.1.3 - Benefits for the management of healthcare organisations:

- Providing the best possible service thanks to the speed of the electronic flow of information.
- Reducing the costs and burdens on the organisation, since electronic management, unlike traditional management, does not consume a large amount of paper and writing instruments, nor does it require a large number of staff, thus helping to solve the problem of data storage and documentation (Hidjazi, 2008).
- Simplification and shortening of procedures for the patient, in particular by providing the possibility for the citizen to go to the administration, as well as reduction of administrative complexity thanks to increased work capacity, reduced need for travel and interviews, and simplification of procedures leading to improved services through information flow programmes and electronic service delivery (Al-Shaer, 2000).
- Facilitate communication between departments and divisions within the same healthcare organisation, as well as with other organisations, and provide automatic archiving of patient record information, ensuring accurate and documented information.
- Controlling, securing, protecting and ensuring information security.

- Enhance the concept of total quality management and performance by improving the quality of services provided.
- Electronic management helps the top management of organisations to make timely decisions by having accurate and necessary data available when needed, as well as providing feedback on all activities and needs.
- It eliminates several levels of management and it can be said that there is only one level of management linked to the network, with the network becoming the management.
- Electronic management contributes to achieving excellence by improving and developing its services in a way that eliminates bureaucracy and reduces its costs, because electronic management is more suited to current and future requirements, because it expands the participation of all stakeholders inside or outside the organisations, making transparency and clarity at their highest levels, and it also motivates everyone to interact clearly and continuously with the organisation without coming to the administration, which adds to the organisation's values and drives it to establish its sustainable advantage (Al-Aloush, 2004).

3.2- Applications of electronic management to information systems:

3.2.1- Financial and administrative system:

This refers to a set of administrative tasks aimed at facilitating and reducing the time required to complete tasks, which include:

1- Invoicing:

These are invoices related to medicines, medical supplies, accommodation, food and various equipment used in the provision of accommodation services.



2- Patient registration:

This is the process of registering each patient admitted to or discharged from the hospital.

3- Employee and payroll services:

This includes all processes related to employees, including recruitment, promotions and salaries.

4- Electronic Materials Management:

Healthcare institutions rely on this system to monitor and manage the inventory of medical supplies, pharmaceuticals and other materials. This is the same system used for Enterprise Resource Planning (ERP) in non-healthcare organisations.

3.2.2 Medical Systems:

1. Patient Information System:

Doctors rely heavily on the results of medical laboratory tests to make critical decisions that help to accurately diagnose the patient and prescribe the appropriate medication. This process begins with the collection of patient test requests, the organisation of these requests into electronic schedules, and the distribution of the tests to the appropriate analysers. The results are then either automatically generated by the instruments or manually entered by the clinician, until the process is completed with the delivery of the test results to the patient (Al-Souaisi, 2012).

2. Benefits of the Laboratory Information System:

The benefits of this system vary from one system to another, depending on the level of the system and the area of application, whether it is a traditional or electronic system. These benefits are manifested in the following points:

Provision of information: This laboratory system makes it easier to get answers to questions, whether about the cost of carrying out the tests, the sample collection requirements or the ability to carry out a particular test in that laboratory.

Provision of worksheets: Worksheets are prepared with patient names and the tests required for them, with the tests classified according to the specialities available in the laboratory. This task requires considerable effort and time when done manually, due to the large daily volume of requests submitted to the laboratory.

The ability to achieve analytical reliability: This problem arises from the large number of samples circulating in the laboratory, as the worker may misidentify the reference of some samples, resulting in the patient's analysis being performed on blood or a sample from another disease. To avoid this, the sample name, date and patient name should be recorded on the sample before it is taken from the patient to prevent this error. This is achieved by the Laboratory Information System by printing labels containing at least the above information, such as the digital code, which will be used to identify this sample during analysis in the laboratory (Al-Dweik, 2010).

Compilation of analysis results from analysers:

This process is carried out by the analysers themselves, which are connected to a printer. The patient's results are then compiled and delivered to them, without adhering to any particular method of printing the results. The results are often reprinted using a typewriter or computer with an appropriate editing system.

Supervision of analytical results issued by the laboratory: Laboratory analyses are carried out under supervision to ensure the scientific validity of the results, and this is better guaranteed by the electronic system than by the manual one.



The possibility of studying the evolution of the patient's condition: In addition to the analysis results of the samples, the laboratory can provide the attending physician with a table and graphs showing the patient's analysis results, or several results for the same patient over a given period of time, which greatly facilitates the determination of the appropriate treatment for that patient, while saving time.

Provision of medical statistical studies: This electronic system makes it possible to know the prevalence of certain diseases over a period of time in certain regions or their prevalence in certain age groups (Al-Dweik, 2010). This is only possible by accumulating a certain number of the patient's laboratory results, which helps researchers and scientists to use these results for statistical studies.

3- Electronic Radiology Information System:

This is an integrated electronic system used by the medical radiology department. This system is based on digital storage, processing, distribution and display of various medical images for specialised healthcare providers (Al-Souaisi, 2012).

This system helps to significantly improve patient care outcomes. Patients no longer have to bear the cost of transporting films, and this is a system with no room for error.

4- Electronic Pharmaceutical Information System:

This system is based on a set of complex computer systems and aims to improve the efficiency of medical departments, patient safety and reduce treatment costs, as well as being fully integrated with the hospital information system (Al-Dweik, 2010).

5- Electronic Medical Order Entry System:

This is an automated electronic system that allows doctors to send their prescriptions, diagnostic tests and radiology orders to the relevant departments such as pharmacy, laboratory and radiology. It records all of the physician's orders for the patient, such as the type of diet, suggested medications, dosages and scheduling of medical tests and examinations. These orders are then automatically sent to the relevant departments, such as the laboratory or radiology.

6- Electronic health record:

This is the electronic patient and health record that documents the patient's healthcare. The patient record consists of several data elements, the first of which is a structure called (SOAP) for each problem, which has three sections:

- Source data from the medical history.
- Diagnosis.
- Treatment.

Conclusion:

As a result of the achievements of the application of e-government as a modern approach to the delivery of public services, including the health sector, many countries have sought to apply it in the delivery of their services in various sectors. Algeria is among the countries that have adopted the e-government model and applied it to public services, including the health sector, with the aim of meeting the needs of citizens in the shortest time and at the lowest cost.

By studying the performance of e-government in improving public health services, a number of results have been obtained, the most important of which are



1. E-government is a new approach to providing services to citizens with the aim of improving the efficiency of services, especially in the health sector, by examining the routine procedures that hinder citizens in order to provide information and data in an easy way.
2. E-government is the result of the multiple transformations of information and communication technologies, and it performs the same tasks as traditional administration, but through a unified electronic pattern.
3. The difficulty in achieving the e-government system in the health sector in Algeria is due to the lack and weakness of the requirements of e-government, which has led to the obstruction and delay of its implementation.
4. For the integration of e-government in its administration, especially in the health sector, it is necessary to have the belief of the top management and the supervisory authorities in the effectiveness of these modern technologies to achieve a qualitative leap in the health sector, so that it becomes the main driver of the transformation.

Proposals:

In the light of the results obtained, a number of proposals have been made:

1. Preparation of the necessary infrastructure for the implementation of e-government management in health institutions.
2. Provide the necessary and sufficient budget to meet the requirements of e-government management.
3. Attract qualified and specialised human resources in information technology to work in health care institutions.

4. Continuously monitor and develop the infrastructure of equipment, programmes and networks to ensure their validity for the application of e-government management in the light of the rapid development and change of information and communication technologies at present.

5. Promote the use of e-Government management in Algerian hospitals, with an emphasis on training and qualifying human resources in the field of e-Government management.

6. Healthcare institutions should organise training symposia to raise awareness among workers and employees about the role of e-government management in facilitating the performance of tasks.

7. Work to raise awareness among health care workers and citizens alike, encouraging them to master modern techniques and trying to create an electronic culture.

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