

Digital transformations and media and communication technology security challenges

التحولات الرقمية وتحديات أمن تكنولوجيا الاعلام والاتصال

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Abstract:

Digital transformations provided distinctive solutions in many sectors and supported digital developments. The study aims to identify the positives presented by digital transformation applications and the resulting security problems, so that we can look at the challenges facing transformations to achieve the security of information and communication technology and digital networks. Based on the descriptive approach, the study reached the following conclusions: International efforts are based on drafting and renewing legal texts in line with digital developments, in addition to calls from competent organizations for cooperation and coordination to prevent criminals from using countries as a field for operations that affect the security of digital information. The Algerian legislator is working to develop various national legislations to keep pace with digital transformations to limit or reduce risks. And the protection of electronic data processing systems is particularly important by issuing the law relating to special rules for preventing and combating crimes related to information and communication technology.

Keywords:

Algeria. Digital information security. Digital transformations. Information security legislation. Media and communication technology.

ملخص

قدمت التحولات الرقمية حلولاً مميزة في عديد القطاعات ودعمت التطورات الرقمية، وتهدف الدراسة للتعرف على الايجابيات التي قدمتها تطبيقات التحولات الرقمية وما نتج عنها من إشكالات أمنية، لنقف عند التحديات التي تواجه التحولات لتحقيق أمن تكنولوجيا الاعلام والاتصال والشبكات الرقمية، واعتماداً على المنهج الوصفي توصلت الدراسة إلى أن الجهود الدولية قائمة على صياغة وتجديد النصوص القانونية بما يتماشى والتطورات الرقمية، إضافة إلى دعوات المنظمات المختصة للتعاون والتنسيق لمنع المجرمين من اتخاذ الدول كميدان للعمليات الماسة بأمن المعلومات الرقمية. ويعمل المشرع الجزائري على تطوير مختلف التشريعات الوطنية لمسايرة التحولات الرقمية للحد أو التقليل من الأخطار، وحماية أنظمة معالجة المعطيات الالكترونية خاصة بإصدار القانون المتعلق بالقواعد الخاصة للوقاية من الجرائم المتصلة بتكنولوجيا الاعلام والاتصال ومكافحتها.

الكلمات المفتاحية

أمن المعلومات الرقمية. التحولات الرقمية. تشريعات أمن المعلومات. تكنولوجيا الاعلام والاتصال. الجزائر.

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I. INTRODUCTION

Today, the world is living in new technical conditions and rapid transformations linked to scientific and technological development, which controls the orientation of institutions and individuals in exploiting modern technological capabilities to perform business and spread the knowledge message. We see that global societies benefit from many new technologies and applications, such as the digital economy, big data, cloud computing, the Internet of Things, and artificial intelligence. In the scientific and academic field, we find distance learning and lecturing and the exploitation of digital education platforms, which was reflected in one way or another on economic, service and knowledge activities and had a positive impact on people and their services, so it was necessary for various sectors to shift to services. Modern digital technology and taking advantage of the capabilities provided by these various digital transformations.

All of this has not kept society far from the complexities that have arisen and developed in light of digital technology, especially those related to preserving digital property, individuals' intellectual rights, and individual privacy in the digital environment in light of what is known as information security, where the greatest concern for digital transformations remains the efforts and challenges working on Providing a safe environment for information. In this study, we will work to define digital transformations, explain their details, identify the applications and relative procedures technological aspects associated with them, and identify the technical and legislative measures taken in order to provide a safe environment for digital information

1. Objectives of the study

This study generally aims to research the issue of digital transformations to highlight their concepts, the issues they raise, and efforts to achieve information security in light of the spread of digital technology. The study also aims to:

- ❖ Collecting and controlling the theoretical and terminological concepts of digital transformation.
- ❖ Introducing the various applications and resulting technologies related to aspects of digital transformation.
- ❖ Identify the additions and positives that digital technology has provided to individuals and society.
- ❖ Highlighting the various negative effects and dangers of digital transformations, especially with regard to digital information security.
- ❖ Identify the technical measures taken by institutions and individuals to ensure the security of digital information.

2. The importance of the study

The importance of the study is as follows:

- ❖ Highlighting the most important concepts and definitions that govern the term digital transformations.
- ❖ Recognizing the importance and additions that various aspects of digital transformations have made to society and individuals.
- ❖ Identifying the close relationship between the various aspects of digital transformations and ways to deal with them to serve individuals to achieve digital transformation.
- ❖ Identifying international and Algerian efforts to achieve information security in light of digital transformations.

3. The problem of the study

To research the issue and attempt to reach the security challenges facing digital transformations, we posed the following questions:

- ❖ What are digital transformations and what are the impacts on them?
- ❖ What are the challenges associated with protecting and security of information in light of the widespread spread of digital life?
- ❖ What are the legislative procedures and measures taken to ensure the protection of digital information?

4. Study methodology

In this study, we are working to introduce a topic of great importance at the present time, as institutions and organizations have sought to make the most of digital technology. In this study, we have relied on the descriptive approach by extrapolating and analyzing the processes of benefiting from the digitization of documents and files and the processes of storing and managing services, and through... Providing services and working to gain customer confidence by developing electronic platforms and websites and relying on digital technology . We will also review the various Algerian and international legislative measures that work to limit the spread of infringements and threats to the security of digital information.

5. Digital transformations

5.1. The concept of digital transformation

Digital transformation is a broad term that has many manifestations in many sectors that benefit and contribute to the procedures that lead to this process .Therefore, digital transformation is a term that has complex conceptual and substantive associations that affect society and society's institutions in general, and affect information networks and administrative, technical, economic, and professional digital services. Thus, we find Many definitions have been given to this term, and in this part of the study we will try to address the most important definitions that address the term digital transformation.

In general, digital transformation refers to the use of computers and the Internet in the process of creating more efficient and effective economic value. It also refers to the changes brought about by information technology in the methods of work, and this term is dealt with extensively with new strategic concepts and related terms such as digital business and digital transformation strategy. The idea of digital business strategy is based on how to understand information technology as a basic condition for innovation and competition. (Chaouchi & Khalouf, 2023)

Firstly, in the world of business, digital transformation is the integration of digital technology and a fundamental change in how we operate and provide value to customers. It is a cultural change in which organizations challenge the current reality to overcome the deficit in providing services.

It is also known as the process of institutions moving from the traditional business model to a model in which institutions rely on digital technologies in the innovation of services and products, management and marketing, and building a digital strategy through assessing capabilities and studying digital holdings.

Digital transformation is a comprehensive program that affects the institution, the

method and style of its work, and the way of providing its services to the public in an easier and faster manner, relying on digital means and technologies. For the success of the process, it is required:

- ❖ Dynamic capability as a prerequisite for digital transformation.
- ❖ User participation in the design of digital services.
- ❖ Co-production and creativity to increase the legitimacy of digital transformations.

5.2. The importance of digital transformation in society

❖ Today's institutions, regardless of their activities and specializations, need to adopt modern and advanced technology to maintain their position and achieve excellence and well-being for their people.

❖ has contributed to achieving the well-being of individuals, especially as it relates to the development of media and communication technology and its ability to achieve integration in many fields, including educational, health, entertainment, commercial, and communication transactions between individuals in different and distant environments.

❖ Digital transformation technology has made it possible to provide information and make it universally available, transcending the boundaries of time and space without any difficulties.. (Chaouchi & Khalouf, 2023)

5.3. Digital transformation objectives

Digital transformation aims to:

- ❖ Promoting the development of information technology systems and digital culture at the institutional and societal levels.
- ❖ Strengthening education systems and supporting excellence in digital work in society.
- ❖ Establishing and supporting digital communications infrastructure, ensuring its management, developing access capabilities, and achieving a balance between the quality of services and their costs. (Chaouchi & Khalouf, 2023)
- ❖ .protecting the supreme interests of countries
- ❖ Improving access to services and establishing quality controls and mechanisms for digital .services provided to the community
- ❖ while ensuring Enhancing the protection and transparency of digital information .independence and enhancing trust
- ❖ .contribute to ensuring the continuity of information systems
- ❖ Taking measures to protect citizens from potential electronic risks in the field of digital .transactions
- ❖ from providing secure programs and Protecting electronic operating systems .unauthorized access attempts

5.4. Benefits of digital transformation

The benefits of digital transformation can be indicated at three levels:

At the level of citizens, the most important thing that supports their rights is enhancing the rights to obtain, use and share knowledge and information, facilitating access to services, stimulating innovation and creating a new work team.

At the level of investors, digital transformation contributes to supporting internal investment and attracting external investment by facilitating procedures, achieving transparency, providing information infrastructure, and using electronic applications in

management and training.

At the level of government agencies, digital transformation contributes to combating and eliminating corruption, increasing the efficiency and effectiveness of government services, raising the level of government performance and providing real, always-on digital services.

5.5. Risks of digital transformation

- ❖ One of the most important risks of digital transformation is the heavy reliance on digital technologies, which has consequences and additional costs that individuals and governments may not bear.
- ❖ Digital transformation contributes to increasing the size of websites on the Internet, which increases the potential for them to be targeted by vandals and hackers. (Chaouchi & Khalouf, 2023)
- ❖ Electronic capabilities or digital innovation contribute to breaching and breaking cyber security measures.
- ❖ Digital proliferation contributes to the integration between information technology systems, operating technology, and the Internet of Things, which increases the difficulty of processing and controlling information.

6. Manifestations of digital transformations

In this section of the study, we will learn about the manifestations of digital transformations in society, by which we mean the various applications and developments taking place in the digital field, which arose in the computer environment and information networks to develop digital services and projects for the various problems in which the individual and institution of various types fall, and one of the most important manifestations of transformation is Digital we find:

6.1. Digitization

The term digitization is considered one of the most important and closest applications of digital transformations, which are the most important developments The major technology known to the information and communications technology sector, thanks to which new methods have been developed for preserving, exchanging and making information available, and digitization represents the basis Modern digital information systems.

6.1.1.The concept of digitization

Digitization is defined as a technological process that works to convert various types of digital format, enabling the conversion of documents, regardless of their type information into and container, into a series of digital codes. Numerical ,and this technical work is to accompanied by a set of works , physical and software equipment, and intellectual effort organize the information, in order to describe it , tabulate it, and represent the content of the digitized text. (DELHOUMI, 2001, p. 72)

Digitization or digital transformation of informationDigitization It is the process of " gital format , to be processed by a computer . In the field of converting data into a di information systems, digitization usually refers to converting printed texts or images into binary signals , using a scanning device to read them on a computer. "

Documents are digitized by scanning, where information is converted through scanner to The paper document becomes a set of symbols in computer language , while the use computer vices, and of these documents is done through computers, information networks, digital de digitization . It is not limited to paper documents and printed information sources only, but also includes audio recordings and film thumbnails It can be digitized using special programs and devices installed on the computer that convert and store it in digital form.

And therefore Digitization is a process by which data is converted into a digital format, to be read and processed by a computer, whether this data is printed text, images, or sounds, using appropriate digitization devices. Digitization has contributed to pushing institutions and services in many sectors to support digital transformation..

6.2. Electronic commerce

E-commerce is considered one of the oldest manifestations of digital transformation, as it has worked to transform commercial transactions and exchanges into digital transactions. Attempts to establish commercial transactions have appeared since the sixties of the last century with the emergence of the CompuServe website, which has become one of the most important companies for electronic services and commerce over the Internet.

E-commerce witnessed a prominent development in 1979 with the laying of the foundations for Internet marketing, and the first market for exchanging goods was opened in 1982. The most important things that can be noted are the Amazon and eBay sites, through which 1 million daily commercial transactions were conducted in 1997 .E-commerce also contributed to the emergence of Electronic payment services via credit cards, which has developed in banking and financial services and the emergence of electronic money. All of this is an extension of digital transformation and the pumping of information and data into the Internet and giant servers, so that electronic commerce is based on collecting information about products, consumers, their behaviors and needs, and studying the market while relying on promotion. Electronic services and goods.

E-commerce is defined as an online system that allows the buying and selling of goods, services, and information, and enables the movements of supporting the request for goods and information, and supporting sales and customer service .E-commerce is considered an electronic space in which the seller, supplier, companies, stores, intermediaries, and buyers communicate, and in which products and services are provided in a digital virtual format. (Lamri, 2024)

E-commerce is an electronic business tool based on the electronic exchange of data. It also includes many private commercial activities for the exchange of goods and services, sales and delivery operations, electronic transfers of funds, invoices and auctions, and includes both traditional and digital goods and services. (Boukhari, 2022)

World Trade Organization defined it as “the production, marketing, sale, and distribution of products through telecommunications networks.” The Algerian legislator defined it in Article 6 of Law 18-05, which includes electronic commerce, as“ the activity in which the electronic supplier proposes or guarantees the provision of his goods and services remotely to an electronic consumer via Through electronic communications, electronic commerce is based on the following elements: (Slaimi & bouchi, 2019)

The electronic supplier is the entity that displays services and goods in the electronic commercial space.

electronic consumer is the customer who purchases goods and services and is the entity on which electronic commerce focuses on studying and collecting private information.

Carrying out commercial transactions. which are the various operations that ensure the provision of goods and services electronically.

Using modern communication technologies. All of the previous three parties carry out their own operations in electronic space based on technological techniques and means, most notably computers and information networks.

6.3. Digital platforms

Digital platforms are one of the manifestations of digital transformation, as they provide the digital ground and collect digital services in a specific place with an electronic address to practice human activities in the digital environment. The term platform carries several objective connotations and is linked to many scientific fields. The meaning to be studied is that which relates to the field of technology. The digital word that originates and develops in cyberspace, information networks, and the Internet. The word is used in many places and carries many meanings in the Arabic language, with multiple meanings, including the highest part of the building, the observation observatory, and in the military field it means a place to install artillery equipment, In the field of petroleum, the place of establishing exploration stations on land or sea, etc., As for the meaning closest to the field of study, it was used in the 19th century in the United States of America, Platform, and it carries the meaning of a set of proposals and programs prepared by a political or cultural organization in the form of demands or reforms.

6.3.1. Digital platform

The name digital platforms is related to what is digital, informational and interactive on information networks, as it is defined as a group of subsystems and interfaces that form a common structure through which a group of digital information sources and resources can be prepared and made available and developed efficiently, and other applications can also be integrated into the platform.

digital platform is a set of capabilities provided to the beneficiary in order to employ, use and publish digital documents and materials by the service provider. They are integrated into the infrastructure via cloud storage after being created and designed by the institution through a group of applications developed using programming languages, and the beneficiary can control the materials. Digital deployment and settings without the ability to control the network, operating systems and storage.

The digital platform is an organized software package on the Internet that works to speed up and simplify transactions between users. Digital platforms were created to serve the digital market while providing physical products. They are common in major companies and various types of companies, starting from startups to large institutions, and are relied upon to perform a variety of things. One of the functions of business, especially interacting with customers. (Patrizio, 2023)

It became a platform term It is one of the most common terms in recent years, as the term reached the peak of its spread and popularity during the Corona pandemic in the year 2020, when various countries, with their sectors, institutions, and companies, resorted to carrying out their work and providing their services using digital platforms.

The importance of platforms has begun to increase and many platforms have emerged that provide their services to beneficiaries on a large scale. There are digital platforms for education, health platforms, and platforms for providing food or transportation services or selling products, among others.

provided over the Internet that enable the user or various business sectors to perform multiple tasks in the same place over the Internet, without the need to use traditional methods. Here we mean the f information that the user needs and existence of a link and integration between a series o enables him to access the required service in the same place from which he started.

Equal Experts defines a digital platform as a product that functions as a platform and functions as a service The platform consists of various individuals, processes, and means, which facilitates the development, replication, and operation of digital services on a large scale. Digital platforms allow organizations to save time in marketing operations, increase revenues while saving costs, and create innovative products for customers. It also makes it easier for the work team to create, publish, and operate digital services .Providing a curated collection of high-quality essential items. (What is Digital Platform IGI Global, 2023)

6.4. Cloud computing

Over the course of more than two decades, digital transformation has resulted in the emergence of large-sized digital files and the widespread spread of digital information on websites and databases. Major problems have emerged related to the inability of individuals and many institutions to deal with digital information and the problems of obtaining, storing and managing the huge amount of this information, especially in light of the costs. The rise in the acquisition of large storage devices and programs capable of managing the huge volume of digital information came, as cloud computing came to be thought of as a suitable solution to the problems of storage and management of digital information. The American National Institute of Standards and Technology defined cloud computing as “a model for enabling permanent and appropriate access to the network based on demand and sharing.” A set of computing resources (networks, servers, storage, applications and services) that can be deployed and provisioned quickly with minimal management effort and interaction with the service provider.

6.4.1. The concept of cloud computing

and computer data to what is called the cloud, which is a large storage device that is .accessed and dealt with via the Internet

term that refers to technologies in which digital resources are provided for It is a services, and beneficiaries can access them via the Internet, from anywhere and at any time, d a without the need to possess knowledge and experience. Cloud computing can be considere concept that includes software as a service, and other modern trends in the world of .technology that share the idea of relying on the Internet (Zerzar & Benourida , 2019)

Cloud computing is also known as a technology that provides its services, whether software, storage, or platforms, across digital networks, with the ability to access them through any electronic medium connected to the Internet at any time and from anywhere. (Bougherara & Ghanem, 2022)

It is the exploitation of computer power and the storage capacity of automated servers remotely through information networks and the Internet to provide storage servers in order to

provide a private space for the user to store information, backup copies, and self-synchronization. This technology gives software processing capabilities, scheduling tasks, and managing e-mail, printing, and other work. (Letabi, 2019)

6.4.2. Benefits of cloud computing

❖ Infrastructure costs are low

Operating costs and benefiting from cloud computing technologies are very limited compared to creating a database, information network, and electronic services in a self-managed manner. This technology contributes to eliminating the large financial costs of acquiring electronic devices and digital information storage devices in addition to electronic document management software, as cloud computing enables the provision of storage space. Software is made available directly to sources, and benefiting from resource management software reduces acquisition costs and modernization and maintenance costs. Institutions also benefit from saving IT staff costs.

❖ Capacity and reliability

This positivity is represented by the institution's technical ability to benefit from cloud computing services, even if they are small, with large storage capabilities and the possibility of unlimited increase in storage space, whether for the institution or the beneficiary, with great reliability in protecting information and networks based on the fact that the system uses highly secure protection systems, and the institutions The donor provides special services according to the needs of the beneficiaries.

❖ Flexibility and ease of use

These are the processes issued by the institutions that provide cloud computing services, which guarantee permanent and real-time updates to the software and user interfaces while providing special options for all beneficiary institutions. They also provide more flexible contract terms.

6.5. Big data

Experts agree that big data is a term that refers to the set of information resulting from a in society and reliance on digital technology in human transformations series of digital interactions, as digital information is produced in volumes that exceed the capacity of ing, transferring, traditional database tools to store and process it in terms of collecting, shar storing and managing it in an acceptable period of time to analyze that data. The use of the data that is characterized by its digital where it was given to ,1997 the year term dates back to spread with the widely become This data has .large size, variety of forms, and speed of flow which , And digital platforms . websites commerce, digital marketing, and-development of e .nd require great capabilities to process itproduce a huge amount of information a

The concept of big data from the perspective of big data service providers is the tools .and processes we need to deal with a large amount of data for the purpose of analysis the content is source of big data the most important , According to the reality we live in show And it continues to grow as statistics . networks , which has grown widely on social media ,daily that since 2004, Facebook has had about 2 billion users , with 1.5 billion users active and , quivalent to 500 terabytes of informationwhich is eGoogle search engine searches 15 .exabytes of data based on a smart mathematical algorithm

Big Data is a complex, multifaceted term whose concept varies depending on the entity this data, whether a user or a company active in the field of data contributing to the creation of

:processing and collection. It has several names in foreign languages: Gross Données, Données Massives, Big Data, Giga Données. McKinsey Institute defines big data as a massive collection of data that has reached a size that exceeds the ability of traditional database tools. We find that traditional databases deal with text and analyze it, manage, store, to capture, video clips, audio files, files and numbers only, while what is called big data includes image dimensional models, geographic location data and many data published on websites and three electronic platforms that allow beneficiaries to add all types of digital content (Letabi, 2019).

Tools and technologies such as Big data is processed using many tools: STOM, HPCC, GRIDGOIN and the most famous big data management program Hadoop as it is considered an open source software framework that supports distributed applications for big data, and it can manage the data range from one server to five thousand electronic support the process of expanding devices (Miliani & Sfahlou, 2019).

Big data includes all the movements and actions performed by users on electronic devices, whether devices connected to the Internet (computers, smartphones, tablets, smart watches), these actions are reading, listening, browsing, or exchanging data, images, videos, email, various posts, comments, tweets, clicks, browsing, searches, and notification results, which do not have the capabilities to analyze it leads to the creation of useful data for organizations that

6.5.1. Characteristics of big data

As for many of the concepts presented for big data, they differ from the data currently published across various sites and databases, and agree on three basic common characteristics, called 3V which are Volume, Velocity and Variety. As for the additional characteristics presented, we find the value of change and others (Ferrah & Keribet, 2022).

Size: It is the most important feature of big data, as its size is very large to the point of its value increases with the being spread across a large number of electronic servers, and it increase in its size and the diversity of data in it.

Diversity: Big data is characterized by the diversity of its sources and forms, in the form of texts, images, audio, video, monitoring data, geographic data, and economic statistics.

Speed: It is the rate of data flow in the form of packets. It is measured by weekly, daily, hourly, and even minute and second flow, based on the large volume of information produced in many sectors, which is collected from the activities of institutions and users connected to the Internet. (Kout, 2023)

6.6. Artificial Intelligence

Artificial intelligence is on the list of the latest and most important technologies resulting from the digital transformation in the world, as it is the collection of many technologies and benefits from them in order to simulate human intelligence in analysis, selection, and automatic provision of answers. The first signs of using the term artificial intelligence go back to the year 1956, when a number of scientists applied to the college. Dortmund in the United States of America to organize a conference that brings together scientists in mathematics, logic, and computer science to establish the science of artificial intelligence (AI), which was presented at the conference for the first time and is a science that aims to simulate human intelligence and perform intelligent actions.

John MC Carthy developed the first concept of artificial intelligence as follows: "The science of engineering intelligent machines, especially computer programmes." According to the European Commission, artificial intelligence in 2018 is "systems that display intelligent behavior by analyzing between them and taking actions with a certain degree of independence to achieve goals." Specific.

Artificial intelligence is a term made up of two words. Intelligence is the ability to understand and think, which is the individual's cognitive ability to learn from experience and reason, remember important information, and deal with the requirements of daily life. Artificial means something that is unnatural, manufactured, or artificial.

Artificial intelligence is a branch of computer science concerned with studying and creating computer systems that learn new concepts and tasks, can think and reach useful conclusions, understand natural languages, observe and understand visual scenes, and can perform tasks required by human intelligence.

Artificial Intelligence are automated systems that mimic human intelligence to perform tasks and can improve themselves based on the information they collect and the data they analyze.

It is the processes resulting from the development of computer systems to be able to perform tasks that require human intelligence while practicing the thinking process, and then numbering the processes into equivalent accounting processes that increase the computer's ability to solve problems. (Djawad Raghieb et al., 2022)

Artificial intelligence is a system resulting from the development of computer science and software with the aim of producing technologies and machines capable of performing human tasks after providing them with data. These tasks include extracting data, improving research methods, selecting topics, correcting written errors, producing news, improving the quality of content, predicting and understanding human reactions, analyzing Public opinions, combating fake news.. (Djawad Raghieb et al., 2022)

Modern artificial intelligence is a broad subject that uses advanced techniques to retrieve predictions and perspectives from huge amounts of data. The basic principle behind it is to train machines to learn and solve problems that we deal with every day. Machine learning in the early twentieth century accelerated the development of artificial intelligence. (Alit, 2023)

7. Digital transformation security challenges

Digital transformations and their manifestations have resulted in many new human behaviors, such as the extensive use of digital information and the widespread use of digital technology. The digital environment has dominated a large percentage of services and transactions, and cyberspace has become attracting a high percentage of individuals in the world. On the other hand, many inappropriate actions have also appeared. Which was called electronic crime or crimes against data processing systems, which affect individuals and devices that make up networks and digital information on systems and cause significant material and economic losses. It has become an obsession for individuals and websites, which affected the confidence of beneficiaries and increased their fears in dealing with the aforementioned digital systems. This is what prompted those interested in the field to develop regulations and techniques to protect the digital environment from these behaviors, working to enhance information security in various digital systems.

7.1. Elements of digital information security

Digital transformations in the world have resulted in many features and effects on institutions and various sectors of society. Many dangers and infringements on the rights of individuals and institutions have emerged, which has prompted institutions and specialists to

think and work constantly on securing digital information and electronic space in general, as each of the technicians worked to develop programs and protocols to secure Information security personnel and legislators also worked to develop legal frameworks to punish violators and trespassers in cyberspace. Information security operations aim to ensure the following:

❖ **Confidentiality and reliability**

Confidentiality and reliability are the highest levels of security that are important to users and which websites, programs and institutions work to ensure in the services provided, as various entities in the digital space compete and strive to work to secure and preserve information so that it remains private to its owners and can only be accessed by those authorized to do so, and the higher the rate of information confidentiality. Its privacy increases as websites and digital platforms become more reliable.

❖ **Integrity and content integrity**

One of the most important elements of electronic information security is ensuring the authenticity of published information and ensuring that it is not distorted or tampered with, especially in light of the wide capabilities that the digital space provides to users. Therefore, sites and institutions work to ensure and preserve information at all its stages, whether in publishing, processing, or exchange, as in Dealing within the organization itself, because correct information is an important economic resource in cyberspace.

❖ **Continuous availability of information and services**

Due to the spread of electronic services in the world, the wide spread of users, and the different circumstances and times of using digital systems on the Internet, websites today work to provide information and services permanently by taking advantage of various services and modern technologies such as cloud computing and electronic platforms to ensure the provision and continuity of information. Ensuring the continuity of services and the provision of information It increases the value of websites and increases the number of users.

7.2. Algerian legislative efforts for digital information security

Based on the technological development and the spread of media and communication in Algeria, the Algerian legislator criminalized acts that affect computer systems. The Algerian legislator was concerned with securing transactions in the digital space, as he established a number of regulations related to electronic proof, signature, and electronic documentation, in order to preserve the rights of all parties to administrative and commercial transactions in the digital space. He also cared about the security of electronic information and all its details, so he considered compromising automated data processing systems with all their components a criminal act.

7.2.1. Legal protection in Algerian legislation

Digital transformations in the world and in Algeria have led to the spread of electronic information systems and the spread of the negatives of their use, which has prompted countries and international organizations to develop the legislative structure to limit these actions. The Algerian legislator has paid attention to this field, trying every time to remedy the legislative vacuum and keep pace with international efforts in the field of protecting

automated systems and their users. And its contents, (Chaine, 2022) as the relevant laws were included in:

✓ **In the constitution**

In Article 44, which stipulates Rights Day, we mention excerpts from it: "Freedom of intellectual, scientific and artistic innovation is guaranteed to the citizen", "Copyrights are protected by law... Academic freedoms and freedom of scientific research are guaranteed and practiced within the framework of the law"...

"The sanctity of a citizen's private freedom shall not be violated... The confidentiality of correspondence and private communications in all their forms shall be guaranteed".

✓ **In the Penal Code**

The Algerian legislator placed acts that affect automated media systems in the category of crime and amended a group of articles in this regard, where this type of crime was called harming automated data processing systems, and he grouped it into 8 articles, from Article 394 bis to Article 7:

In Law 04-15 of November 10, 2004 supplementing Ordinance 66-156, it criminalizes and establishes corporal punishments for all of the following acts:

- ❖ Inserting, removing, or modifying data from automated processing systems by fraud, trickery, or theft.
- ❖ Designing, researching, collecting, providing, publishing, or trading in data stored or processed through an information system in which automated processing crimes may be committed.
- ❖ Possession, disclosure, publication, or use for any purpose or objective of data obtained from one of the aforementioned crimes.
- ❖ This law also states that the penalty for cyber crimes should be doubled if they affect the nation's identity, national security, methods of defending it, and public institutions.
- ❖ Punishment for the crime of forming a group, participating in it, or agreeing to plan to commit a cybercrime.

✓ **In the Criminal Code**

With the aim of eliminating or reducing criminal acts and practices in automated data processing systems, the legislator supported laws for the authority of investigation, investigation and follow-up, in a manner similar to the method of tracking traditional crimes such as inspection, inspection and seizure, in addition to intercepting correspondence, electronic surveillance, leakage, recording votes and taking pictures.

Mechanisms and devices have also been allocated for these tasks by forming security services, supporting police detectives, and strengthening the structure of the judicial police.

✓ **Law No. 09-04 of August 5, 2009 on special rules for the prevention and combating of crimes related to media and communication crimes.**

It is the law that was established to detail the legal mechanism for preventing and combating crimes related to media and communication crimes, explained in six chapters and 19 articles, as the law included the following

which contains the objectives of this law and an explanation of the :Chapter One .technical terms and concepts included in the law, in addition to its scope of application

s that allow resorting to electronic monitoring Chapter Two: Its articles explain the case .and the methods of implementing it

includes provisions on the rules for inspecting information systems and :Chapter Three .seizing the required data or seizing it by preventing access to the data

r: It explains the rules for inspecting information systems and seizing the Chapter Fou .required data or seizing it by preventing access to the data

Chapter Five: Its articles detail the establishment of a national body to prevent and .nd communication crimes and its taskscombat crimes related to media a

presents the forms of international judicial cooperation and assistance and :Chapter Six the jurisdiction of the law

7.3. International efforts to secure digital information

7.3.1. United Nations efforts for information security

The United Nations has made great efforts to combat crimes related to the digital space due to the economic losses and the political and social problems they cause, as it works to convince countries of the necessity of joint action. The United Nations General Assembly has issued a number of resolutions in this field, including: (Gribiz, 2021)

❖ Resolution on developments in the field of information and telecommunications

In the context of international security, No54/49 ., this resolution calls for intensifying international efforts to prevent the misuse of information technology resources to achieve criminal or terrorist purposes, especially since the General Assembly has registered the concern... of the military and civil security of states due to the misuse of digital space, as has been stated. Enactment of Resolution55/28 , which stipulates the necessity of international cooperation by paying attention to combating cybercrime and calling on Member States to take measures to reduce existing and potential threats to the field of information security, as approved by the General Assembly in Resolution56/19 , to take information security measures in a way that contributes to maintaining the flow of information. Free information.

❖ Resolution on combating the misuse of information technology for criminal purposes:

Resolution 65/63, which carries a number of measures aimed at combating abuse and criminal purposes, can be referred to in the following forms:

- ❖ States must ensure that their laws and practices do not provide a safe haven for those who misuse information technology.
- ❖ The need for countries to exchange information related to the problems of confronting and combating the misuse of information technology.
- ❖ Defining the work in the field of preparing and implementing the law, which contributes to combating the misuse of information technology.

7.3.2. United Nations conferences

The United Nations has been concerned with the security of the digital space since the 1980s by holding several international conferences, beginning in 1985 in Italy, which came out with a set of guidelines based on the non-spread of digital transactions and the limits of infringements. The Havana Conference was held in Cuba in 1990, which approved the principles and guidelines issued in The aforementioned conference emphasized in its recommendations:

- ❖ The necessity of protecting human private life from technological risks.
- ❖ Improving computer security procedures.
- ❖ Modernizing national criminal laws.
- ❖ Increasing international cooperation to combat cyber crimes.

The Twelfth Congress was held in 2010 in Brazil on Crime Prevention and Criminal Justice, in which member states discussed various developments in the field of the use of science and technology.

The United Nations encouraged cooperation with the European Union and the security organizations Interpol and Europol to implement the international strategy for cybersecurity.

7.3.3.The role of regional organizations in protecting electronic information cation technologysecurity and protecting information and communi

❖ European Union efforts

Considering the European Union as a unified regional entity, it works jointly to achieve information security and develop a defensive strategy to protect member states through physical and legislative coordination between member states. We have recorded great legal efforts in the field of protecting electronic information security, including:

*Directive 2000/31/EC of the European Parliament and of the Council of Europe on legal aspects.

*Framework Decision of the Council of the European Union 2000/413/GHA on combating fraud and counterfeiting of non-refundable payment media.

EU Council Framework Decision 2005/222/GHA on attacks on information systems.

Directive 2006/24/EC on the retention of data extracted or processed within the framework of the provision of electronic communications services available to the public.

❖ The role of the North Atlantic Treaty Organization (NATO)

The external electronic attack on Estonia in 2007, as an unconventional weapon, was considered an act that prompted NATO to reconsider its calculations and work to identify the enemy, emphasizing the work on defense of all member states in the alliance. In this context, the alliance in 2008 established the Cooperative Electronic Defense Center with the aim of assessing the defense capabilities of countries. Members and raise awareness of cyber security issues.

The work and activities of NATO continued until the year 2012, when 58 million euros were allocated to develop the defensive capabilities of countries against electronic attacks, and it was agreed in 2013 to establish a team to protect all electronic activities and networks in cyberspace and the information networks of NATO countries. (Gribiz, 2021)

II. Conclusion

At the conclusion of this study, in which we learned about the concepts associated with

digital transformations and the additions they provide to individuals and institutions of all kinds, in addition to the aspects of digital transformation from e-commerce and big data to artificial intelligence, while identifying the most important challenges facing these projects in securing digital information, with reference to Algerian and international legislative efforts to secure cyberspace. The general results of the study can be presented as follows:

- There are a group of services and technologies that have contributed to the progress and spread of digital transformation projects in the world, such as digitization and e-commerce. Digitization has contributed to converting intellectual heritage and institutional commerce. Digitization has contributed to converting intellectual information into digital systems, which has facilitated digital transformation processes. E-commerce has provided many goods and services on the Internet, which has prompted digital transformation for the individuals around the world to enter and benefit from facilities it has provided in transactions.

- Digital platforms have played a major role in replacing human transactions into the digital space, which has prompted individuals around the world to integrate into the transformation. Cloud computing has eliminated the problems of transferring and storing large files with high reliability to enhance digital transformation in the world.

- Big data is one of the effects of digital transformation based on the volume of data resulting from the collection, transfer and storage of information on the Internet. The technologies for managing this information are what supported the digital transformation and made big data an economic commodity with added value.

- latest manifestations of digital transformation are artificial intelligence, in which we see maximum benefit from information, platforms, and all digital transformation applications, so that software can simulate human intelligence and deal with more freedom.

- In the field of digital space security, the Algerian legislator worked to amend and update the provisions of Algerian laws from the Constitution, the Penal Code, and the law on the prevention and combating of crimes related to the Criminal Penal Code. Law 09 on information and communication technologies was also drafted to keep pace with technological developments in Algeria, to limit electronic violations and eliminate electronic crime.

- national The United Nations has called in its resolutions for the need to provide laws to prevent the activity of cybercriminals on various territories and the need for coordination and cooperation to combat the misuse of information technology.

- Regional organizations such as the European Union and NATO have played an role in coordinating and developing member state legislation to support a important structure that facilitates digital transformation while preventing the spread of misuse of this technology.

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