# BLOCKCHAIN A TECHNOLOGICAL SUPPORT FOR SMART ADMINISTRATION

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***Abstract***
*Blokchain technique is viewed as the most cutting- edge technological innovations in the smart and electronic administration. It helps in the execution of the administrative tasks, mainly administrative and electronic contracts on which several countries rely in order to facilitate access to public services and achieve public interest whether in administrative or judicial field, as it ensures efficiency and transparency in smart administrative transactions.*
***Keywords:*** *Blockchain, Administration, smart contracts, electronic, administrative tasks*

## INTRODUCTION

The administration Endeavour's to achieve the public interest by offering public services to citizens and stakeholders to gain public interest. However, this idea has developed tremendously, and has influenced the concept of traditional administration, which led to the emergence of the idea of smart administration, through the utilization of new technologies, which would serve the public interest in a fast and effective way. Blockchain is one of these technologies that is regarded one of the technological programmes on which the idea of smart and electronic management is based. It is used by many countries to protect public data, record it and organize it according to automated software that would help the administration serve the public interest of its stakeholders on the one hand, and acquire transparency and equality among citizens on the other. On this basis the following research questions are raised:

-What is meant by blockchain technology in smart administration?

-What is its role in developing the smart management system?

To answer these questions the research is divided into two parts:

**1- blockchain in the smart administration.**

**2- The possibility of applying blockchain technology in smart administration**

**3- the applications of blockchain in the smart administration.**

### 1. Conceptual framework of blockchain technology in the smart administration

The oringins of blockchain in the field of finance and business go back to bitcoin ; a digital currency that emerged in October the 31 of 2008 when "Satoshi Nkamoto" sent an email containing a summary of coding mechanisms in the financial and banking field, called double spending that occurred with coding mechanisms. It was later called "Blockchain". This advanced technique hinges upon the idea of block sequencing, arranging and organizing them in the field of smart administration, where various electronic administrative works are built upon.

### 1.1. The historical evolution of the emergence of blockchain technique

This technique went through three fundamental phases, the beginning of which was applied to coding of digital currencies labelled Blockchain 1.0, then it developed into Blockchain 2.0 , where this stage witnessed a remarkable and unprecedented development in the field of artificial intelligence, as another type appeared in 2013 supporting the initial blockchain called "Ethereum," and it came with new functions. The most important of which are administrative contracts.

As far as the current stage is concerned, it is regarded the most important stage and is called Blockchain 3.0, which appeared in 2018 and it expanded the scope of its applications. The most important of which are: health, governance, education, and smart administration in order to digitize all its fields, therefore transforms a traditional society into an electronic one within the framework of governance, management and smart cities.[i]

**1-2 Definition of blockchain technique**

The concept blockchain is implemented to define two terms "chain and blocks". This mechanism is regarded, from the point of view of the World Economic Forum, one of the ten most important modern techniques, and one of the most important technological mechanisms in the Fourth Industrial Revolution, which embraced radical changes in the way of governments, public administrations, private sector, and civil society work. It is an emerging technology that works alongside a group of other technologies such as artificial intelligence (AI), the Internet of Things (IOT) and machine learning (ML) in order to give a helping hand to those dealing with the administration in providing public services because it is considered an effective and ideal means to manage identity in the public sector, since it reduces corruption, forgery and fraud. The reason is that it relies on coding system that confirms the credibility and security of administrative or ordinary information.[ii]

**1-3 Characteristics of Blockchain technique**

Implemented in different auxiliary fields, this technique is characterized as follows:

- Building mutual trust between all dealing parties, public administration or stakeholders.
- Unifying data and integrating it into a unified information system, this may be accessed by possible and previously specified technical ways.
- Achieving legal and information security for economic clients with the administration.
- Safe and effective supervision of the transfer of objects, money or shares through the information system subject to this blockchain technology.

**1-4 Types of Blockchain**

The bolckchain technique is built upon four principal types which are as follows:[iii]

**1-4-1 General Blockchain:** It is a system and network where all stakeholders across borders have access to it but with a license from official authorities

**1-4-2 Private Blockchain:** It is a private network of customers who have the right to view information or join it.

**1-4-3 Hybrid Blockchain:** It is a network that combines public and private blockchains, that is, the platforms that can be accessed by the public is publicly but the latter require permission for its access.

**1-4-4 Federal Blockchain:** It defines the platform that embraces pre-specified businesses and people, and therefore it is not a general platform but rather an authorized platform for a specific category.

**1-5 Stages of Blockchain technology operation:** This technique is implemented as follows:

- To submit the application which encompasses approval of the transaction according to the technology
- The platform must ascertain the validity of the transaction presented according to the tools it has access to.
- After ensuring its integrity, it adds the transaction to a file called (ledger) after creating a new block (Block).
- The cryptographic fingerprint called "hash" is then created with the series of files found on the platform, and then a closed data block is established, in order to create the blockchain[iv]. Therefore, it is an accurate and complex information process supervised by skillful people to ensure the safety of administrative transactions according to this technology, which is regarded an effective support for embodying artificial intelligence in government and administration as well.

**1-6 Components of Blockchain**

The main components of these techniques are represented as follows:[v]

**-Block:** It is the fundamental unit of this technology and it is utilized to store a set of electronic transactions, as well as it attempts to store it on all contracts in the electronic network.

**-Information:** It is known as the individual matter, it is the sub-process that the blockchain hinges upon.

- **Hash**: It is the DNA that characterizes the chain of blocks and distinguishes them from each other.
- **Time imprint:** It is the time space in which the operations are stored within the chain.

**-Nodes:** they are the devices on which this technology depends in order to store data through consensus algorithms.

**2-The possibility of applying blockchain technology in smart administration**

Blockchain technology is viewed one of the most important modern technologies that is presumably effective and widespread in public administration, as well as it provides public services, achieves the public interest, embodies and protects the principle of competitive freedom, ensures respect for the principle of transparency and equality. Therefore, it avoids all forms of administrative and financial corruption.

**2-1 Definition smart management**

Smart management is defined as an extension of electronic management. It is not defined by a time frame, place, or traditional structural organizations because it hinges upon integrated networks that link public skills on the one hand and the administration and stakeholders on the other. Among the results of smart management are the following[vi]:

1- Administration without a place, where the responsible of administrative work becomes able to take administrative decisions and run the public administration even if he is far from the job site.

2- Timeless administration, where the employee is not bound by the time of work, and is far from the traditional administrative structure.

3- Administration without rigid structures and organizations, which are often centralized.

4- Zero paper administration: It is one of the most important results of implementing the smart management system, where the administrative management becomes more flexible, easy and less complicated as it depends on smart means and smart skills such as the smart phone, computer and e-mail.

**2-2- Fundamentals of transition from Electronic to smart management**

The transition from electronic management to smart management requires various means which may be listed as follows:

- Reliance on smart applications in smart governments, which bring positive impact on smart administration, with applications implementing them in public services.
- Reliance on government large data.
- The gradual shift towards the electronic cloud, which plays a big role in storing and safeguarding information.

**2-3 Positive effects of blockchain in smart management**

Blockchain is an administrative and financial system. It aims to facilitate administrative activity for the administration and stakeholders as well to achieve public interest. Its application has many positive results. However, there are governments that are still studying the possibility of its application for fear of the negatives effects that may result from it.

**2-3-1 Embodiment of decentralized Administration**

The primary goal of blockchain technology in the system of smart management is to achieve and embody administrative decentralization, through cultivating confidence with stakeholders during administrative transactions, far from the pressures and interventions of the central administration. However, this characteristic may affect the traditional concept of administration in countries and governments, therefore fears of applying technology with all its components threatens those government and weakens central work. The primary goal, therefore, of technology is to try to balance between central work and decentralized work.

**2-3-2 Achieving effectiveness of public and administrative services**

This technique allows to achieve effectiveness and quality with regard to public services. Its organization and coding are made according to its information system which may contribute to protect the public interest and and ensuring the adminitrative transactions with types of administrative and financial corruption.

**2- 3- 3 Protection of administrative affairs from financial and administrative corruption**

Administrative transactions, whether smart or electronic are regarded one of the most important mechanisms that contributed to reduce corruption and nepotism. The impartial way that was spread in the administrative transactions in traditional administrative system may be overcome through

electronic transactions; therefore the computer will be a better monitor and manager of the administrative work from practical and legal perspectives

**2-3-4 Ensuring transparency in administrative transactions**

The principle of transparency is viewed as one of the most important aspect in administrative affairs that all technologies seek to achieve. However, smart and electronic transactions remain one of the important means that protect the administrative work as well as emphasizing it implementation according to the rules of transparency, openness and equality.

**2-3-5 restoring confidence in administrative transactions and ensuring information security**

Ensuring and restoring confidence between the administration and the citizen was often regarded a burden for jurists and administrators, since the traditional transactions were often criticized of nepotism and partiality. However, application of this technology would rebuild trust in administrative transactions which would result in achieving information and legal security in smart and electronic transactions.

**2-4 Obstacles of applying blockchain technology in smart administration**

The application of blockchain technology represents great hindrance and challenges with regard to countries. These challenges are as follows:[vii]

**2-4- 1 Security concerns**

Security concerns pertain to the novelty of this technique which is still subject to experiment from the legal and technical side. These concerns can be represented in the organization of illegal and illegitimate businesses that may be included in blockchain system which affects legitimate transactions negatively. Thus this data could be exposed to hacking that is considered a great concern.

**2-4-2 Legal and regulatory concerns**

This technique is regarded uncertain from the legal side and to lawyers as well because it is still not technically defined. Therefore, to use it as a support in public administration is still under study in order to move to legal and regulatory framing mainly from a security stand point.

**2-4-3 Administrative concerns and human resources**

Administrative concerns consist in the necessity of equipping administrative structures in order to keep pace with technological development which are necessary to comply with when implementing them in smart administration as the cost of this technique is high sky and requires establishing infrastructure specific to internet that allows to keep pace with technological and technical development.

As for human resources, it is necessary to form administrators and stakeholders regarding these new technologies to facilitate electronic transactions

**3-Applications of blockchain technology in the field of smart management**

This digital revolution knows many applications in the field of smart management, in digital management in particular, which is directly bound to the interests of the citizen, that has a positive impact upon the improvement and development of the relationship between the administration and the citizen, through the technical means that are framed legally and in an organized manner, or in the field of elections which has known many criticisms related to forgery and control of the pertaining results. This application is regarded one of the techniques practicing this right and duty in electronic and technical conditions that would achieve transparency and effectiveness of the electoral process, therefore achieving democracy and equality in the country.

**3-1 Digital identity management:**

This administration is regarded one of the most important tasks assigned to traditional administration in general and smart administration in particular. It is one of the most important challenges facing the administration and through which it regulates the relationship between the state and its citizens.

**3-1-1-Definition of digital identity**

Digital identity is defined as all the data that constitute the identity of a natural person enabling him to prove his identity legally and authentically. However, there is a difference between the digital and virtual identity because it may seem to some to be the same. While the digital identity is the official identity that is declared to the administrative bodies electronically, the virtual identity

is the unknown identity circulating in the virtual community, therefore is unreal and illegal[viii].The first one gives the beneficiary access to many services provided by the government. The most prominent countries that have adopted this technology are Switzerland and the United Arab Emirates [ix], where this identity is characterized by an identification number known as the ID number and is associated with its holder for life. It also allows him to benefit from all government services and some non-governmental and commercial services that require to prove identity where the citizen will have several advantages as follows:[x]

Possession of secure digital identity

-Unified registration of access to all government websites and services from a mobile phone.

-Digital signature and authentification of documents.

-Update the profile.

-Update address and contact information.

-Take advantage of customized services.

**3-1-2-Types of digital identity**

This technology uses several applications in the field of digital identity. Without further ado, here some types of identity[xi] :

**a)-Mobile digital identity:** this type pertains to specific information at the level of mobile phones, or smart phones, with copies kept in the relevant and official Department[xii] .

**b)-Identity of electronic chips:** this kind is adopted for digital identification through radio chips, which are implanted under the skin in the hand or arm, and this technology was applied in Switzerland[xiii] .

**c)-Sovereign self-identity:**

the identity is registered in accordance to this technology through blocks that are not modifiable or changeable. Blockchain technology in this case is based on two keys ; the public key+ and the digital private key - , therefore it can only be opened through a digital signature, which is more secure and private[xiv] .

**3-2-Election through blockchain technology**

Election is regarded as a right and a duty at the same time. It is a constitutional and legal embodiment of the rules of democracy and transparency in the state. The reason that pushes various legal and constitutional to find out means and techniques through which it can achieve democracy and avoid different forms of perjury which primarily affects the system of the government and the constitutional institutions of the state. On this basis, electronic voting is considered one of the legal mechanisms through which all forms of legal imbalances can be overcome. This has prompted researchers in the technical and electronic and legal field to rely on the latest technologies in order to access the voting procedure and close all outlets that affect negatively the electoral process. Thus blockchain technology is viewed as the latest technologies adopted, as it is the second generation of electronic voting that has been adopted by many countries such as Estonia and South Korea, where voting through this technology is characterized by arranging lists and electing by decentralized coding, which puts an end to the manipulations that can be caught through traditional or electronic voting.[xv]

## CONCLUSION

To wrap it up, Blockchain technology is one of the latest technologies developed in the world of modern technologies, which aims to enhance public services for the citizen and ease the task of obtaining them. This technology has affected several applications, whether in the public sector such as government, electronic administration, or even in the private sector such as smart contracts, Nevertheless, the majority of countries are still afraid of relying on this technology, due to the disadvantages that it can entail, especially affecting privacy and fear of hacking and using information recorded in accordance with this technology, which affects the rights and property of citizens.

**-RECOMMENDATIONS**

Without let or hindrance here are the recommendations:

- A profound study of this technique should be made by experts in the technological and information field before starting its application.

-Assisting legal and administrative specialists to know about this technique to ensure legal and regulatory comprehension to determine the rules of its application therefore to use it as a support.

-establishing the legal and regulatory framework governing this technology, which includes several areas, especially those related to security aspect and to the field of protection of personal and financial privacy.

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