

Application of Artificial Intelligence Systems in Public Administration Algorithmic Administrative Decisions as a Model

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Abstract:

Public administration has made significant progress in improving the quality of public services since the advent of computers in the mid-twentieth century. It transitioned from traditional administration to electronic administration, which positively impacted the services provided to the public. However, the emergence of Artificial Intelligence (AI) systems accelerated the transformation of public administration toward a more modern and technologically advanced concept—*smart administration*. This occurred through the adoption and use of AI systems (algorithmic systems) in administrative activity, particularly in the process of making administrative decisions, as these decisions represent the primary legal tool through which the public administration expresses its will. Consequently, a new type of administrative decision has emerged, known as the algorithmic administrative decision.

Keywords: Artificial Intelligence, Public Administration, Algorithmic Systems, Administrative Decision, Public Service.

Introduction

Since the 1960s, the world has entered the era of the Fourth Industrial Revolution, driven by the so-called *Smart Digital Revolution*. This revolution is based on three fundamental pillars: the Internet of Things (IoT), Big Data, and Artificial Intelligence (AI).¹ Among these, AI constitutes the backbone of the three pillars due to its positive impacts across various fields and sectors²

Economically, for example, according to a report by PricewaterhouseCoopers (PwC), AI is expected to contribute approximately 15.7 trillion USD to the global economy by 2030, while contributing around 320 billion USD to the economies of Middle Eastern countries—equivalent to about 11% of the region's GDP.

From the perspective of public governance, many states tend to adopt AI systems in the design and implementation of public policies, especially regarding the proper functioning of public services and the quality of public service delivery. In this regard, algorithmic AI systems contribute to the formulation and adoption of administrative decisions, and in many cases, may autonomously issue such decisions through predictive analytics and machine learning. This has led to the emergence of what is now referred to as the algorithmic administrative decision, representing one of the most prominent features of the transition from electronic administration to smart administration.

The central research problem of this paper can thus be formulated as follows:

What is the legal concept of the algorithmic administrative decision and what are its constitutive elements?

This overarching problem gives rise to the following sub-questions:

- What is meant by Artificial Intelligence?
- What are algorithmic systems?
- What distinguishes traditional administrative decisions from algorithmic administrative decisions?
- Is there a difference between algorithmic administrative decisions and

¹ For further detail on the Fourth Industrial Revolution, see: Ihab Khalifa, *The Post-Information Society – The Impact of the Fourth Industrial Revolution on National Security*, 1st ed., Al-Arabi Publishing and Distribution, Cairo, Egypt, 2019.

² Nermin Magdy, *Artificial Intelligence and Machine Learning*, Publications of the Arab Monetary Fund, Abu Dhabi, United Arab Emirates, 2020, p. 18.

electronic administrative decisions?

To address all of these research questions, the study has been divided into two chapters and several sections, as follows:

- **Chapter One:** The Conceptual Framework of Artificial Intelligence
 - Section One: Definition and Characteristics of Artificial Intelligence
 - Section Two: Types of Artificial Intelligence
- **Chapter Two:** The Concept of the Algorithmic Administrative Decision
 - Section One: Definition of the Algorithmic Administrative Decision and Its Distinction from Similar Concepts
 - Section Two: The Constitutive Elements of the Algorithmic Administrative Decision

Conclusion

Chapter One: The Conceptual Framework of Artificial Intelligence

Before addressing the concept of the algorithmic administrative decision and its positive implications for the performance of public administration, it is necessary to first examine the concept of Artificial Intelligence (AI) by reviewing the main definitions offered in the literature, as well as its practical characteristics and types, as outlined below.

Section One: Definition and Characteristics of Artificial Intelligence

This section aims to highlight the most important definitions provided regarding the meaning of the term Artificial Intelligence, in addition to identifying its key characteristics.

Subsection One: Definition of Artificial Intelligence

It should be noted at the outset that credit for the emergence of the term “Artificial Intelligence” goes to the American computer scientist John McCarthy of Dartmouth College, Hanover, USA, in the 1950s—specifically in 1956. He defined AI as “the science and engineering of making intelligent machines.”

In this regard, we may distinguish between two types of definitions:

Firstly: Institutional Definitions

Several international organizations and institutions have addressed the concept of

Artificial Intelligence in the context of formulating and implementing their programs. Among the most important institutional definitions are the following:

1. **UNESCO:** AI is defined as technical systems capable of processing information in ways that simulate human intelligence, incorporating aspects of thinking, learning, perception, prediction, and planning. Such systems include machine learning, artificial neural networks, fuzzy logic, case-based reasoning, natural language processing, problem representation and reduction, multi-agent systems, automated reasoning, cyber-physical systems, and others.
2. **World Intellectual Property Organization (WIPO):** AI is a branch of computer science that aims to develop machines and systems capable of performing tasks requiring human intelligence, with limited or no human intervention.
3. **Organization for Economic Cooperation and Development (OECD):** AI is a machine-based system that, given a set of human-defined objectives, can make predictions, recommendations, or decisions influencing real or virtual this type of academic definition:³

Second: Academic Definitions

Many researchers and specialists in computer science and information systems have attempted to provide a comprehensive and precise definition of Artificial Intelligence. Among the most notable definitions are the following:

1. **John McCarthy:** Artificial Intelligence is the science and engineering of making intelligent machines.
2. **Charniak & Dermott:** It is a science and technology based on a number of knowledge domains such as computer science, mathematics, biology, philosophy, and engineering, aimed at developing computer functions to simulate human intelligence.⁴
3. **Alain Bonnet:** It is the ability of a computer program to solve a specific problem or make a decision in a particular situation based on an accurate description of that situation, achieved through many reasoning processes fed

³ Mohammad Mansour Khalil Khuzaymiya, *Civil Liability for Artificial Intelligence Damages – A Comparative Study*, Master's Thesis, Faculty of Law, Arab American University, Jenin, Palestine, 2023, p. 9 et seq.

⁴ E. Charniak & D. Dermott, *Introduction to Artificial Intelligence*, Addison-Wesley Publishing Company, Canada, 1985, p. 6.

into the program.⁵

4. **Abdel-Ilah Ibrahim Al-Faqih:** It is a branch of computer science that aims to design intelligent systems, making computers simulate human thinking and some human behavioral capabilities, thereby endowing them with characteristics that we recognize as intelligence in human behavior.⁶
5. **Ahmed Ibrahim:** Artificial Intelligence is a branch of computer science concerned with how machines can simulate human behavior. It is therefore the science of creating devices and computer programs capable of thinking in the same way as the human brain, learning as we learn, deciding as we decide, and acting as we act.⁷

In conclusion, these definitions show that Artificial Intelligence is about developing intelligent machines and information systems designed to perform specific tasks and functions in a manner that simulates human intelligence, provided

" if they meet a set of defining characteristics, which will be explained in the following section.

Section Two: Characteristics of Artificial Intelligence Systems

Artificial Intelligence (AI) systems are distinguished by a set of characteristics that can be summarized as follows:

1. **Accuracy and Efficiency:** AI systems are characterized by their capacity for continuous and effective development, which enables them to perform highly complex tasks repeatedly and consistently without problems.
2. **Control and Elimination of Human Errors:** AI systems can avoid many human errors that often occur in various fields. For instance, in delicate surgical operations where the probability of error is high in human decision-making, AI systems can minimize these errors easily and within a very short time.
3. **Cost Reduction:** The adoption of AI systems significantly reduces the costs of providing public services, particularly with respect to human labor. While

⁵ Alain Bonnet, *Artificial Intelligence: Its Reality and Future*, translated by Ali Sabri Farghali, Publications of the National Council for Culture, Arts, and Media, Kuwait, 1990, p. 11.

⁶ Abdel-Ilah Ibrahim Al-Faqih, *Artificial Intelligence and Expert Systems*, Dar Al-Thaqafa for Publishing and Distribution, Jordan, 2012, p. 8.

⁷ Ahmed Ibrahim, *Criminal Liability Arising from Artificial Intelligence Errors in Emirati Legislation: A Comparative Study*, 1st ed., United House Publishing, Sharjah, United Arab Emirates, 2022, p. 23.

reliance on human workers decreases, the remaining workforce is trained to use AI technologies effectively.

4. **Improved Decision-Making:** By employing AI systems, it becomes possible to achieve more optimal and effective decisions through the systematic processing of required data.
5. **Access to and Analysis of Updated Data:** AI systems can extract data that humans cannot access, process it at exceptional speed, interpret it, and convert it into actionable outputs while avoiding errors and problems through proper coordination.
6. **Understanding and Analyzing High-Dimensional Data:** Many types of data cannot be fully comprehended by the human mind due to their complexity and the need for precise algorithmic processing. AI systems therefore serve as the ideal substitute for human effort in handling such data.
7. **Capacity for Machine Learning:** AI systems can autonomously learn based on past experiences, data, and newly acquired information, establishing rules for the use of this knowledge in future tasks.⁸

1 Section Two: Types of Artificial Intelligence

Scientific research and continuous technological experiments have revealed new forms of AI systems, which has led experts to classify Artificial Intelligence into three main types:

First: Narrow or Weak AI

This type of AI refers to the current intelligent applications adopted in various fields, where the role of software and intelligent systems is limited to performing a specific task or function according to a predefined path and scope. These systems cannot deviate from their programming, and thus their behavior is considered a set of programmed reactions to particular situations.

An example of this type is the operation of Automated Teller Machines (ATMs), which function according to a preprogrammed intelligent system with strictly defined tasks. Another well-known example is IBM's *Deep Blue*, a computer program specialized in chess, which succeeded in defeating the world champion in 1997.

Second: General or Strong AI

This type represents a more advanced level compared to Narrow AI. It describes

⁸ Aqeel Najm Mahdi Al-Tamimi, "Administrative Liability for Unlawful Acts of Artificial Intelligence," article published in the *Journal of Human and Natural Sciences*, available online at: www.hnjournal.net, accessed on 13 February 2025.

the development of machines and systems to a point where they become intellectually and functionally equal to humans. Such systems operate independently of human intervention, relying on stored data, accumulated experiences, and various past situations, enabling them to make autonomous and intelligent decisions.

Examples include intelligent systems for self-driving cars, unmanned aerial vehicles (drones), and medical robots specialized in diagnosing tumors (e.g., skin cancers) through image recognition technologies applied to photographs of skin lesions.⁹

Third: Super Artificial Intelligence

In reality, this type of Artificial Intelligence is still under experimentation and scientific research. It is considered the most advanced and, at the same time, the most dangerous form of AI compared to the previous two. Specialized studies in genetic engineering, biotechnology, and nanotechnology aim to push AI systems toward levels of cognition and performance that surpass human intellectual capacity.

This is sought through comprehensive brain mapping using billions of nanoscale devices to decode the human brain and under approach represents an attempt to link biological intelligence with Artificial Intelligence through reverse-engineering principles.

It becomes clear from examining the characteristics and types of AI that it constitutes a genuine technological leap with positive effects across various domains, providing invaluable services to humanity. However, among the different types of AI, the second type—General or Strong AI—appears to be the most practically relied upon. Advanced intelligent systems of this type are increasingly used to deliver public services without human intervention, making them an indispensable asset.

This has been demonstrated in practice by the accelerated adoption of algorithmic AI systems in national strategies and government policies, particularly in public administration and administrative decision-making. Such developments have hastened the transition to the era of smart administration and led to the emergence of one of its most significant outcomes: the algorithmic administrative decision, which is often taken without the involvement of human officials. This ensures efficiency and speed in administrative decision-making, as will be

⁹ For further detail on the types of Artificial Intelligence, see: Adel Abdelnour, *Introduction to Artificial Intelligence*, King Abdulaziz City for Science and Technology Press, Saudi Arabia, 2005. Abdullah Moussa and Ahmed Habib, *Artificial Intelligence: A Revolution in Modern Technologies*, 1st ed., Arab Group for Training and Publishing, Cairo, 2019.

elaborated in the following section.¹⁰

In this requirement, we will address the definition of the algorithmic administrative decision as one of the legal acts of public administration (Section One), and then we will highlight the differences between it and other similar administrative decisions, particularly the electronic administrative decision and the automated administrative decision (Section Two), as follows.

Section One: Definition of the Algorithmic Administrative Decision

Given the scientific methodology requirements regarding compound terms, as is the case with the term “algorithmic administrative decision,” which is composed of the terms “administrative decision” on the one hand, and “algorithmic” or “algorithms” on the other hand, we must first examine the meaning of each of them separately and then arrive at a comprehensive and precise definition of the concept of the algorithmic administrative decision, as follows:

First: Definition of the Administrative Decision

The administrative decision is considered one of the most important legal means adopted by public administration to express its will. In this regard, the jurist Jean Rivero states: “The administrative decision is the typical method of administrative activity, most commonly used and most distinctive from a theoretical perspective, since public authority manifests itself through it quite clearly.”

As for the definition of the administrative decision, there are many definitions, whether doctrinal or judicial, the most important of which is that it is the legal act through which

the administration expresses its binding will, by virtue of the authority it has under laws and regulations, with the aim of producing a specific legal effect to achieve the public interest. Accordingly, the administrative decision is characterized by a set of features, the most important of which are:

— A legal act, not a material act. — Of a unilateral nature, i.e., it is issued by the unilateral will of the competent administrative authority. — Of an administrative nature, as it is issued by an administrative authority. — Of an executive nature, given the legal effects it produces.

Second: Definition of Algorithms¹¹

¹⁰ Raymond Kurzweil, “Goodbye Biology, Welcome Software,” article published in *UNESCO Courier*, August 2001, available at: <http://unesco.org/courier>.

¹¹ J. Rivero, *Droit administratif précis*, Dalloz, 8th edition, 1979, p. 93

Algorithms are defined as a set of rules. In the *Computer and Internet Dictionary*, under the entry “Algorithm,” they are described as mathematical and computational rules used to reach a result in a finite number of steps, or as a sequence of computational steps taken as a set of input values with the purpose of producing a set of output values. Thus, they are a sequence of instructions which, when followed and executed correctly, lead to a specific result.

As a result, we can say that an algorithm is a set of operations performed on data (inputs) in order to obtain a result and a solution to the problem at hand (outputs).

In fact, these definitions are largely in line with the one provided by the Algerian legislator in Article 03, Paragraph 5 of Law No. 18-07 on the Protection of Natural Persons in the Processing of Personal Data, which states: “Automated processing is operations carried out wholly or partially by automated methods, such as recording data, applying logical and/or computational operations to such data, modifying them, deleting them, extracting them, or disseminating them.”

Likewise, the legislator previously referred to automated data processing systems, including algorithmic processing systems implicitly, when defining information systems in Article 2, Paragraph (b) of Law No. 09-04 on the specific rules for the prevention and fight against crimes related to information and communication technologies, where it states: “An information system is any standalone system or a set of interconnected or related systems, one or more of which performs automated data processing according to a specific program.”

Third: Types of Algorithms

It should be noted that there are two types of algorithms in the field of administrative decision-making. The first type is called the explicit (programmed) algorithm, while the second is called the machine learning or self-learning algorithm.

A – Explicit Algorithm ¹² These algorithms are design constants of the equations that reflect the phenomenon to be simulated (the issue to be processed and decided upon). In other words, the explicit algorithm operates according to a predetermined logic that it cannot deviate from.

B – Machine Learning (Self-Learning) Algorithm: This type is called a machine learning algorithm, as it relies on continuous learning based on data and observations such as examples and direct experience in order to make more efficient decisions regarding problems for which no previous solutions exist. This occurs without human intervention, which makes it more important and effective than the explicit algorithm.

¹² André Logarff, *Encyclopedic Dictionary of Computers and Electronics*, translated by Abdel Hassan Al-Husseini, 1989 edition, University Institution for Studies, Publishing and Distribution, Beirut, Lebanon, p. 47.

Fourth: Definition of Algorithmic Administrative Decision Based on the definitions of the administrative decision as well as the algorithms mentioned earlier, we can conclude that the algorithmic administrative decision is a new form of administrative decision-making in which the administration relies on algorithmic processing systems to ensure the highest degree of speed and efficiency in serving the public interest. According to the two types of algorithms mentioned above, we can distinguish between two categories of algorithmic administrative decisions:

A – Programmed Algorithmic Administrative Decisions: These are the administrative decisions resulting from the application of an algorithmic program that processes repetitive decisions that have already been dealt with. In other words, they are decisions with pre-prepared procedures and their applications are repetitive and routine in nature. Accordingly, the process of making administrative decisions takes place through a series of coordinated steps based on pre-programmed reports.

B – Unprogrammed Algorithmic Administrative Decisions (Self-Executing): These are administrative decisions that do not have a predetermined logic for handling non-routine issues and cases, since they have not been previously processed (they have no precedent). Therefore, these decisions are described as complex and evolving, requiring innovative and immediate solutions. Consequently, making such administrative decisions requires more time and effort in addition to a greater amount of data and information. What characterizes this type of algorithmic administrative decision is that it is self-executing, since it does not rely on any human intervention¹³, which makes them a real challenge for comparative legislation in terms of the extent of their recognition and the establishment of a legal framework for them.

Note: It is worth mentioning that some legislations, particularly Arab ones, have provided for the possibility of administrative bodies adopting AI programs and systems, including algorithms, in the process of administrative decision-making. Among them is the Emirati decisions. However, upon closer examination, one realizes that there are fundamental differences between these and the algorithmic administrative decision, both scientifically and practically. This will be clarified briefly in the following points:

First: Distinguishing Between the Algorithmic Administrative Decision and the Electronic Administrative Decision:

The electronic administrative decision is defined as the unilateral and binding expression of will by the public administration, under its authority and pursuant to laws and regulations, through electronic means with the aim of producing legal

¹³ Adnan Awad Al-Shawabkeh, *The Role of Information Technology Systems in Administrative Decision-Making*, Dar Al-Yazouri Publishing, Jordan, 2011, p. 254.

effects whenever this is legally permissible. Others have defined it as the public administration receiving an electronic request on its website, expressing its binding will to issue the decision, signing it electronically, and notifying the concerned party electronically, all under its authority and pursuant to laws and regulations, with the aim of creating a specific legal effect that is legally valid and permissible in pursuit of the public interest.

Accordingly, it is clear that the difference between the algorithmic administrative decision and the electronic administrative decision lies in the fact that the latter, unlike the former, requires certain formalities, whether regarding its issuance in electronic form, its electronic signature and authentication, or finally its publication and notification by electronic means, depending on the case. These requirements do not apply to the algorithmic administrative decision, which may be issued in either the traditional (paper) or electronic form, and the same applies to its signature, authentication, and notification of the addressees depending on the type of decision.¹⁴ ... it is clear that the difference between the algorithmic

administrative decision and the electronic administrative decision lies in the fact that the latter, unlike the algorithmic administrative decision, requires certain formalities, whether related to its issuance in electronic form, its electronic signature and authentication, or finally its publication and notification by electronic means as the case may be.¹⁵ This is, there is a fundamental distinction between the two decisions: the electronic administrative decision may not rely at all on special processing systems, unlike the algorithmic administrative decision, which is only issued based on a specific algorithmic program as previously explained.

Second: Distinguishing between the algorithmic administrative decision and the automated administrative decision

At the outset, it should be noted that the term “automation” is an Arabization of the English term *Automation*, which means carrying out various tasks and functions by machines instead of the human element. Administrative automation has been defined as the use of a set of computer systems and connected networks in administrative work provided to the public in order to improve the quality of administrative work and support decision-making in a way that serves both the administration and the citizen alike. Accordingly, the automated administrative decision can be defined as that decision issued by a competent administrative authority based on information systems and technology

¹⁴ Adnan Awad Al-Shawabkeh, *The Role of Information Technology Systems in Administrative Decision-Making*, Dar Al-Yazouri Publishing, Jordan, 2011, p. 254.

¹⁵ See for further detail: Rabie Nasira, *The Administrative Activity of the E-Government*, PhD Thesis, Faculty of Law, Mouloud Mammeri University, Tizi-Ouzou, 2019, p. 176. For more detail on the concept of the electronic administrative decision: Al-Arabi Wardia, *The Electronic Administrative Decision as a Modern Method for Managing Public Facilities*, Algerian Journal of Law and Political Science, Vol. 7, No. 1, 2022, pp. 749–760.

with the aim of producing a legal effect.

Automated administrative decisions are divided into two types:

- **Fully automated decisions:** These are administrative decisions made entirely by an automated system without human intervention, and are common in constrained administrative decisions where there is no room for administrative discretion.
- **Partially automated decisions:** These are administrative decisions that rely on support systems, such as expert systems, which provide recommendations to the official who ultimately makes the decision. In this case, the decision is made by the human element with the assistance of the information system.

Thus, it is clear that the automated administrative decision does not reach the level of the algorithmic administrative decision, as it is merely an administrative decision programmed according to a specific information system that cannot be bypassed, unlike the algorithmic administrative decision, particularly the self-executing algorithmic decision.

¹⁶Self-executing and based on the principle of machine learning, which provides creative and innovative solutions to new issues and cases that do not have pre-programmed solutions intelligence systems, specifically algorithmic systems in which the human element may not often intervene in the decision-making process—as is the case for administrative decisions based on machine learning algorithms mentioned earlier—this does not mean that the algorithmic administrative decision does not require the traditional elements recognized for the administrative decision. These elements constitute the basis of the legality of the latter, whether formal or substantive, and will be detailed later. However, what must be emphasized is that these elements acquire particular characteristics in the context of the algorithmic administrative decision compared to the general theory of administrative decisions, as will be clarified below.

2 First Branch: The Formal Elements of the Algorithmic Administrative Decision

Jurisprudence and administrative courts have established that the external legality of the administrative decision, as a legal act, requires two fundamental elements: the element of competence and the element of form and procedures. Accordingly, we will attempt to reveal the specificity of these two elements in relation to the

¹⁶ Salwa Hussein Hassan Rizq, *Smart Automation and Administrative Decisions*, paper presented at the Conference on the Legal and Economic Aspects of Artificial Intelligence and Information Technology, Faculty of Law, Mansoura University, Egypt, May 2021, p. 652.

algorithmic administrative decision

First: The Element of Competence: The element of competence in the administrative decision, in general, is defined as the ability to carry out a specific administrative act or to determine the set of acts and actions that the administration is legally entitled to exercise in a valid manner. This element is considered the only one related to public order, which means that it may be invoked at any stage of the administrative litigation, and the administrative judge may raise it *ex officio* in order to safeguard the principle of legality of administrative decisions. From this perspective, the algorithmic administrative decision does not deviate from this principle¹⁷. However, this element has its own particularity since the making of the algorithmic decision holds competence on the basis of legal texts that determine the competent administrative body to issue such decisions.

Second: The Element of Form and Procedures: The general rule regarding the form of the traditional administrative decision is that the administration is not obliged to follow a specific form for issuing such a decision, meaning that the administration has full discretion to choose the form in which the administrative decision is finally issued. Thus, the decision may be oral or written, either manually or electronically. However, this general rule does not apply where the law requires the administration to adopt a specific form or to follow a specific procedure prior to issuing the decision; in such cases, form becomes mandatory for the administration, and non-compliance renders the decision defective in form and, consequently, unlawful. This is the case with the electronic administrative decision, which requires electronic signing and authentication. As for the algorithmic administrative decision, as noted earlier, it does not require any particular form: it may be issued in either paper or electronic form, unless the law provides otherwise, as is the case under the UAE Electronic Commerce Law of 2002, which states in Article 27: “Any department or government body, within the framework of its legally assigned functions, may issue any permit, license, decision, or approval in the form of electronic records.” This means that the administration has discretionary authority to choose the form in which the algorithmic administrative decision is issued, unless otherwise provided by law. This is in contrast with both the electronic and automated administrative decisions, for which the law always requires specific formalities, as mentioned previously.

3 Second Branch: The Substantive Elements of the Algorithmic Administrative Decision

In addition to the formal elements mentioned above, the validity and legality of

¹⁷ Mohamed Suleiman Al-Tamawi, *The General Theory of Administrative Decisions*, 6th edition, Dar Al-Fikr Al-Arabi, Cairo, 1991, p. 301. — Mohamed Belkheir Ait Oudhia, *The Algorithmic Administrative Decision*, *Ijtihad Journal for Legal and Economic Studies*, Vol. 09, No. 03, 2020, p. 20.

administrative decisions require the presence of substantive elements, which represent the internal legality of the administrative decision and consist of the element of subject matter, the element of cause, and finally the element of purpose. We will therefore address these elements and their particularity in relation to algorithmic administrative decisions as follows:

First: The Element of Subject Matter: If the subject matter of the classical administrative decision is understood as the immediate legal effect intended by the public

authority be directed towards achieving this effect or outcome, provided that it remains within the scope of legality, through the use and employment of algorithmic systems. For example, in the case of using algorithmic programs for the promotion of employees, the legal effect (the subject matter of the algorithmic administrative decision) is determined intelligently and automatically to satisfy the requirements and conditions of promotion previously encoded within the algorithmic program, all without human intervention.

Second: The Element of Cause: The element of cause in the classical or traditional administrative decision refers to the existence of material or legal facts independent of the will and intention of the competent administrative authority, which prompt the latter to issue a particular administrative decision, provided that such cause is real, current, and lawful. Thus, the cause is the motive for adopting the administrative decision—what Dean Duguit referred to as the “inspiring cause” or motive—which differs from the purpose or objective of the decision. In the algorithmic administrative decision, the cause is represented by the motive for adopting the decision, which is reflected in the correspondence between the inputs (data) fed into the algorithmic program and the prevailing circumstances and factors. This means that the element of cause in the algorithmic administrative decision is essentially based on prediction, relying on the hypotheses previously programmed into the algorithmic system.

Third: The Element of Purpose: The element of purpose is the most important element of the administrative decision, as it represents the objective sought by the decision-maker, namely the realization of the public interest. If this objective is abandoned, the administrative decision will be tainted by misuse of power or abuse of authority, rendering it unlawful and subject to annulment. In the algorithmic administrative decision, the purpose or objective is determined at the stage of designing and programming the algorithmic processing system by those responsible for this task.¹⁸

¹⁸ Cited in: Khabal Hamid, *Applications of Artificial Intelligence in the Activities of Public Administration*, PhD thesis in Law, University of Ghardaïa, 2021–2022, p. 177. — Mohamed Al-Saghir Baali, *Administrative Decisions*, Dar Al-Uloom, Annaba, 2005, p. 80. — Kawthar Mansal, Hamid Chaouach, *The Legal Challenges of Adopting the Algorithmic Administrative Decision*, *Al-Risala Journal for Human Studies and Research*, Vol. 6, No. 4, December 2021, p. 809. — Belkheir Mohamed Ait Oudhia, previously cited, p. 22.

In light of the foregoing, the availability of both the formal and substantive elements of the algorithmic administrative decision grants it the attribute of legality, which means its validity on the one hand, and its enforceability against those to whom it is addressed on the other, whether the decision is individual or general, thereby producing its legal effects.

4 Conclusion

In conclusion, this paper demonstrates that public administration today cannot, under any circumstances, dispense with artificial intelligence systems and programs, given their efficiency, effectiveness, and speed in carrying out the growing and evolving tasks and functions of administrative bodies, whether centralized or decentralized. Among the most relied-upon artificial intelligence systems currently adopted in many countries are algorithmic systems, which have become the preferred option for solving pressing problems by providing possible alternatives and solutions quickly and efficiently. This explains their adoption and application in administrative activity, particularly in the process of making various administrative decisions, which constitute one of the most important manifestations of public authority, whether individual or general.

In this context, increasing focus is now placed on algorithmic systems based on machine learning, previously described as self-executing systems, meaning that they do not depend on human intervention in the process of making and issuing the algorithmic administrative decision. This indeed represents a qualitative shift and tangible progress in administrative activity in particular and in governmental work in general, given its positive impact on the quality of public services delivered to citizens, within the framework of the transition of public administration towards smart governance as one of the manifestations of good governance.

Finally, it is appropriate to present some recommendations and practical proposals that the researcher deems necessary for the successful adoption of algorithmic systems in administrative activity, particularly in the process of making administrative decisions. These can be summarized as follows: — The necessity of establishing a specific legal framework for the adoption of artificial intelligence systems, including algorithmic systems. — Determining the responsibilities of all parties involved in the implementation and use of these intelligent systems. — Ensuring the continuous development of these systems to maintain their effectiveness and guarantee the quality and efficiency of administrative decisions, thereby protecting the interests and rights of those affected by them. — Taking into account considerations of privacy protection, through safeguarding personal data from the experiences and expertise of advanced countries in this field, which have made significant progress in adopting artificial intelligence systems,

including algorithmic systems, in gov- ernmental work in general and in administrative work in particular, for many years. — Developing the general theory of administrative decisions in a manner that accommodates the specificities of the algorithmic administrative decision mentioned above, particularly with regard to its constitutive elements and related issues, especially the grounds for annulment of algorithmic administrative decisions.

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