



## RESEARCH ARTICLE

# The Impact of Artificial Intelligence on the Labour Market- From Traditional Professions to Smart Application Professions.

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Artificial intelligence is a product of the Fourth Industrial Revolution and has become a widely used concept in all fields due to the spread of connected digital devices and the big data phenomenon. It is also distinguished by increasing the accuracy of future predictions, raising economic returns, and creating new job opportunities contrary to expectations, as it contributes to reorganizing and redistributing tasks within professions instead of replacing them.

Artificial intelligence programmes have permeated various aspects of human life, and their uses are gradually expanding to include daily functions of all kinds, especially in the field of work. Some jobs will disappear, others will see increased demand in the future, and some will remain unaffected by the artificial intelligence variable.

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**INTRODUCTION**

Humanity today is witnessing a new turning point in its history due to the tremendous developments brought about by the Fourth Industrial Revolution, which differs from the previous three industrial revolutions in its rapid pace, broad scope, and significant impact in all fields, especially the economic field, which represents the primary driver of societal progress. As a result, major drivers have emerged on the global economic stage that will lead the world over the next twenty years, foremost among them the artificial intelligence sector, which will significantly change most job tasks, thereby significantly affecting labour markets.

The pivotal role of artificial intelligence as a transformative technology has begun to emerge in various sectors, strongly affecting the global economy during the second decade of the twenty-first century. While many believe that the potential benefits of artificial intelligence are vast and diverse, the repercussions of its spread have sparked widespread controversy and debate. Despite fears of potential job losses and disruptions in various fields, artificial intelligence can play an influential role in the growth of human capabilities, leading to increased productivity, improved job quality, increased demand for human resources, and ultimately increased gross domestic product because of using generative artificial intelligence systems.

Artificial intelligence applications have proliferated across numerous domains, including but not limited to financial and legal consulting, entertainment, transportation, education, media, healthcare, environment, and electronic gaming. Artificial intelligence applications related to employment in labour markets are of paramount importance, as they will generate new job opportunities.

Artificial intelligence constitutes a cornerstone of the digital economy, providing new employment prospects that demand advanced skills in modern technologies and will contribute to increased productivity. Concurrently, Artificial intelligence applications across various economic sectors will lead to the obsolescence of many professions and a decline in the demand for conventional occupations. Furthermore, the utilization of Artificial intelligence is likely to affect the labour market, with robots potentially replacing human workers in certain roles. However, this will coincide with the creation of new job positions, and a surge in productivity is anticipated in the coming years.

Based on the foregoing, we pose the following question:

- Does Artificial intelligence cause the disappearance of traditional jobs?
- What is the future of the labour market in the context of smart applications?

## **First: Artificial Intelligence:**

### **1. The Concept of Artificial Intelligence:**

Artificial Intelligence (AI) is a branch of computer science and a fundamental pillar of the contemporary technology industry. It is predicated on the assumption that intelligence can be precisely described to the extent that a machine can emulate it.

The term comprises two components: intelligence and artificiality.

'Intelligence' refers to the ability to comprehend new and variable circumstances or situations, encompassing the capacity to perceive, understand, and learn from novel conditions. The key aspects of intelligence are perception, comprehension, and learning.

'Artificiality', derived from "to make" or "to fabricate," denotes objects created through human activity or action, distinguishing them from naturally occurring entities. Accordingly, Artificial intelligence generally signifies intelligence designed or fabricated by humans within machines or computers. Thus, Artificial intelligence is the science of modern machines. (Saad, 2012, p. 114)

Artificial intelligence is a product of the contemporary technological revolution, officially initiated in 1956 at Dartmouth College in Hanover, USA. Initially, Artificial intelligence aimed to simulate various intellectual capacities through machines by understanding the complex mental processes of human cognition and information processing. These mental processes are then translated into computational operations that enhance the computer's ability to solve complex problems.

Consequently, Artificial intelligence was initially defined as: "A field of computer science concerned with programming computers to perform tasks that humans accomplish and require a form of intelligence". (Madkour, 2020, p. 144)

Artificial intelligence is a pivotal modern science resulting from the convergence of the technological revolution in systems science, computer science, and automatic control, with logic, mathematics, linguistics, and psychology. It aims to understand human intelligence by developing computer programmes that enable problem-solving or decision-making. Thus, machine intelligence involves computer programmes finding solutions or making appropriate decisions based on various inferential processes embedded in the programme. AI is employed due to its superior speed in providing inferences beyond human capabilities. (Khalaf Hassan, 2020, p. 220)

Artificial intelligence encompasses a range of novel methods and techniques in computer system programming, used to develop systems that emulate aspects of human intelligence and allow for inferences based on facts and rules stored in the computer's memory. The modern concept of Artificial intelligence involves constructing machines that perform tasks requiring human-level intelligence and developing programs that enable computers to simulate cognitive functions and abilities in a defined manner. (Al Yagzi, 2019, p. 266).

### **2. Artificial Intelligence Terminology:**

In recent times, numerous terms used in the field of artificial intelligence have become increasingly prevalent. Therefore, we will present the concept of each term that we may encounter in our daily lives, based on the Artificial Intelligence Glossary issued by UNESCO. (Mahmoud, 2020, pp. 14-17)

### **2.1. New Connectionism:**

A theory established in the field of cognitive science and neuroscience, concerned with developing information models that simulate learning phenomena using formal neural networks. These models and their operational methods are designed to resemble physiological nervous systems.

### **2.2. Internet of Things (IoT):**

The connection of objects, tools, and places in the physical world to the internet. Connected objects collect data through sensors (temperature, speed, humidity) and transmit it over the internet for computer analysis. These objects may include a transport vehicle, a watch, an industrial machine, or even a space in a car garage.

### **2.3. Machine Learning:**

Thanks to machine learning programmes, machines learn how to solve problems by using examples, enabling them to compare and classify data, and even recognize complex patterns. Before the invention of deep learning in 2010, humans supervised this type of learning, explicitly defining whether an image contained a human face or a cat's head, to enable the machine to perform the required recognition process.

### **2.4. Deep Learning:**

An advanced field of machine learning, allowing machines to autonomously recognize complex concepts such as human faces and bodies or animal images by analyzing millions of images from the internet, without these images being pre-labeled by humans. Deep learning relies on integrating machine learning algorithms with artificial neural networks and utilizing big data, revolutionizing artificial intelligence with applications in search engines, medical diagnostics, and self-driving cars.

### **2.5. Human-Machine Hybridization:**

A process that allows linking the human body with a technological system, which can be structural, such as an artificial arm controlled by thought, or virtual, such as Google Glass, which allows different information or images to appear in a corner of the lens in addition to our normal vision.

### **2.6. Artificial Life:**

A field of scientific research encompassing various disciplines, aiming to create artificial systems inspired by living systems in the form of software programmes or robots.

### **2.7. Algorithms:**

The origin of the word dates back to the Persian mathematician Muhammad Bin Musa al-Khwarizmi in 820 AD, who is credited with introducing decimal numbering to the West. Today, algorithms refer to a series of instructions that a computer is required to execute automatically. Algorithms are used in all fields, from search engine queries to financial markets, and in selecting information to guide internet users.

### **2.8. Cloud Computing:**

Various information systems consisting of a large number of interconnected computers, exchanging information automatically over the internet. In this way, a network of interconnected computers forming this information cloud can perform a computational process or store a set of information from one computer to another.

### **2.9. Formal Neural Network:**

An algorithm designed for use by a computer to mimic the neural connections of the brain. Although current systems are very simple compared to human intelligence, they can predict the speed of a car based on the movement of the accelerator pedal and the slope of the road, or determine the hardness of a material based on its chemical composition and temperature during preparation, or assess an institution's ability to meet debts based on its turnover.

### **2.10. Immersive Virtual Reality:**

A virtual environment organized by a computer, in which the user immerses themselves using various sensors (glasses, sensory suits). Immersion in virtual reality may interest a video game player or a pilot in training.

### **2.11. Augmented Reality:**

A superposition between reality and virtual elements adjusted by an automated information system (sounds, two- or three-dimensional images, videos). This technology is used in video games and cinema (where the viewer interacts with virtual objects using sensors).

## **3. Characteristics of Artificial Intelligence**

Artificial intelligence is based on "creating intelligent machines that behave like humans," using a comparative approach to the human method of problem solving, and dealing with hypotheses simultaneously, with high accuracy and speed.

Artificial intelligence has many characteristics and advantages, including (Al-Nadjar, 2010, p. 170):

Using intelligence to solve presented problems in the absence of complete information.

Thinking, perceiving, acquiring, and applying knowledge.

Learning and understanding from past experiences.

Using old experiences and applying them in new situations.

Rapid response to new situations and circumstances.

Dealing with difficult and complex situations.

Dealing with ambiguous situations in the absence of information.

Distinguishing the relative importance of elements of known situations.

Imagination, creativity, and understanding and perceiving visual matters.

Providing information to support decisions.

One of the most important properties of artificial intelligence applications is that they: operate at a stable scientific and advisory level without fluctuation; their construction requires the representation of huge amounts of knowledge specific to a particular field. They process symbolic non-numerical data through logical analysis and comparison operations. They aim to simulate humans and their methods. They are concerned with generating new ideas that lead to innovation. They immortalize human experience, they work to provide more than one copy of the system and replace experts, and they eliminate the human feeling of fatigue and boredom.

In addition, artificial intelligence creates a mechanism for solving problems within organizations based on objective judgment and accurate assessment of solutions, and raises the cognitive level of organization officials by providing solutions to many problems that are difficult to analyze by the human element in a short period.

Artificial intelligence includes the study of logical thinking processes of the human element, and then trying to implement this through computers, and therefore, its most important feature is its relative stability, as it is not exposed to what the human element is exposed to of factors affecting its capabilities such as forgetfulness. (Zarouki & Falta, 2020, p. 12)

## **4. Objectives of Artificial Intelligence:**

Artificial intelligence (AI) emerged as one of the applied computer sciences that focuses on studying and understanding the nature of human intelligence and simulating it, to create a new generation of intelligent computers; which can be programmed to accomplish many tasks that require a high degree of inference, deduction, and perception.

Artificial intelligence, as a new science with multiple scientific backgrounds and references, has a primary goal and a fundamental strategy, which is to understand the human faculty of intelligence; to enable computers to comprehend human knowledge and information.

Artificial intelligence aims to understand the nature of human intelligence by developing computer programmes capable of simulating intelligent human behavior. This means the ability of a computer programme to solve a problem or make a decision in a certain situation, where the programme itself finds the appropriate method to solve the problem or reach the decision by referring to various inferential processes that the programme has been provided with. (Khawaled, 2019, p. 21)

Artificial intelligence also aims to develop computer systems that achieve a level of intelligence similar to or better than human intelligence. This is translated into placing human knowledge within the computer, within what is known as knowledge bases, and then the computer, through programming tools, can search these bases, compare and analyze, to extract and deduce the best answers and solutions to various problems. The science of artificial intelligence seeks to understand the nature of human intelligence by developing computer programmes capable of simulating intelligent human behavior. This ability means solving problems or making decisions, and it is considered a significant turning point that goes beyond the concept of traditional information technology, where inference is done by humans, while the computer's role is limited to its high speed. (Bakhit, 2000, p. 46)

The most important objectives of artificial intelligence can be summarized as follows:

Replicating human intelligence.

Solving complex knowledge-intensive tasks.

Creating an intelligent connection between perception and action.

Improving human-to-human, human-to-computer, and computer-to-computer interaction.

Enabling machines to process information in a way closer to how humans solve problems, i.e., parallel processing, where multiple commands are executed simultaneously.

Better understanding the nature of human intelligence by exploring and simulating the brain, as the nervous system and the human brain are the most complex organs, working in an integrated and continuous way to recognize things. (Mahmoud, 2020, p. 266)

### **5. Importance of Artificial Intelligence:**(Koutou, 2018, p. 26)

The importance of Artificial intelligence can be identified in the following points:

Improving productivity and efficiency: Artificial intelligence can often complete routine tasks faster, better, and more consistently than humans.

Understanding massive amounts of data: We live in a data-rich world, and human brains are not equipped to analyze the vast amounts of structured and unstructured data today, make connections, and discover relationships and patterns across datasets.

Improving decision-making: Artificial intelligence can use data as input to make fact-based decisions, reducing bias and properly considering all facts.

Enhancing customer experiences: Artificial intelligence-powered conversational interfaces can provide faster and more accurate customer service in multiple languages. Artificial intelligence can also personalize experiences and services, providing customized service to each individual, such as personalized learning.

Enabling human-like vision: Artificial intelligence enables computer systems to see, process, and understand visual images such as photos and videos.

Augmenting human intelligence: While the capabilities of the human brain are undeniable, there are limits to what can be achieved in 24 hours.

Artificial intelligence can radically enhance people's intelligence.

### **6. Methods of Using Artificial Intelligence:**

Artificial intelligence is considered the core of transformation in the digital age, contributing to reshaping processes and services in various fields through its advanced methods:



**Machine Learning:**

Machine learning is one of the most prominent AI methods, where algorithms are trained on large datasets to recognize patterns and make predictions.

**Deep Learning:**

Deep learning is a branch of machine learning that uses artificial neural networks with multiple layers to learn highly complex data.

**Natural Language Processing (NLP):**

This technology enables machines to understand and generate human language, allowing for applications such as chatbots and language translation.

**Expert Systems:**

These are computer programs that simulate the decision-making ability of human experts through a knowledge base and a set of rules.

**Big Data Analytics.**

Used to find optimal solutions to complex problems through techniques such as genetic algorithms and heuristic search.

**Optimization:**

These methods demonstrate how Artificial intelligence can simulate human capabilities and improve processes in various fields. (Shetouh & Rahmani, 2024, p. 16)

**Second: The Labour Market:****1. The Concept of Work:**

There are various philosophical, social, and economic perspectives on the concept of work. Work is defined as the process of human impact on nature to obtain a material benefit. This benefit is necessary to secure suitable conditions that help humans continue their work activity. (Mohamed & al, 2015, p. 15)

In other words, work is defined as the process that takes place between humans and nature, where humans affect nature and adapt its resources to become suitable for satisfying their needs.

It is also defined as the arduous and obligatory human activity provided by an individual during a specific period. Work is considered the primary source of society's productivity and development. Economists Adam Smith and David Hume considered it the foundation of national wealth and the creation of everything necessary for a nation's life and prosperity. (Taka & Ajlan Hassan, 2008, p. 19)

We can define work as the physical and mental effort exerted by a person to achieve a material or moral benefit that benefits the worker or others.

**2. The Concept of the Labour Market:**

Many economists have addressed the concept of the labour market from various angles, but these definitions converge on a single meaning. Among the most important of these definitions, we mention the following:

Goodman provides a practical definition of the local labour market, defining it as the area where institutions search for workers and where most residents work.

Modern classical economists, such as Hicks, define it as labour markets that closely resemble perfect competition markets, such as the foreign exchange market, the international finance market, and the commodity market. It also assumes homogeneity of labour, absence of transportation costs, and job advertising costs, and the availability of perfect competition between a large number of sellers and buyers in the labour market.

Economist Kerr, on the other hand, believes that the natural labour market differs entirely from the labour market under perfect conditions, as the average worker's view of the market is narrow, and they are not considered an active participant in it. (Al-Moussawi, 2007, p. 11)

### **3. Types of Labour Markets:**

Due to the heterogeneity of labour services and the different classifications of jobs, such as skilled and unskilled labour, and the difference between a shoemaker's service and a doctor's service, and the variations between specializations, it is impossible to classify and enumerate labour market types into a specific type. For example, if we classify the labour market based on sectors, we find different types such as the labour market in the agricultural sector, the tourism sector, the construction and public works sector, and other related markets. Labour markets can be classified based on profession, such as the market for doctors, pharmacists, and builders.

Markets can also be classified as local, national, or even global, depending on specialization and scarcity. However, what concerns us as researchers in this context is the dynamic aspects of labour markets. In this regard, we find two types:

- The first type: It is the tight labour market, which means a labour market where available opportunities and vacancies are greater than the number of those wishing to fill these jobs.

The second type: It is the slack labour market, which is a labour market where the number of those wishing to work exceeds the available job opportunities. (Mokdad & Abu Hasira, p. 67)

### **4. Characteristics of the Labour Market:**

Given the development of economic and social conditions, particularly the emergence of new phenomena such as the imbalance between labour supply and demand, and the growing unemployment in society, it becomes clear that the labour market is not like other markets. It is characterized by the following:

#### **4.1. Absence of perfect competition:**

This means the absence of a single wage prevailing throughout the market for similar jobs and tasks due to the lack of information about available high-wage job opportunities on the one hand, and the lack of desire among workers to move and relocate geographically or professionally to high-wage areas on the other.

#### **4.2. The Impact of Technological Progress on the Labour Market:**

The impact of technological progress on the labour market is evident in two aspects. The first aspect is the increase in unemployment rates resulting from the replacement of manual labour with machines, which means the elimination of some jobs that some unemployed people should have. The second aspect is the change in the requirements of some jobs due to technological progress, which requires higher qualifications and educational levels to ensure the safe and effective use of machines. Reducing unemployment resulting from this progress requires continuous education and training. (Mokdad & Abu Hasira, p. 68)

#### **4.3. The market aspect of the labour market:**

This refers to the employment market, which is supply and demand governed by price (wage), which is determined by a set of factors and determinants such as the size of demand, the size of supply, the efficiency of job seekers, and the high requirements set by institutions in the recruitment process. All these factors fall within the framework of the employment market governed by economic dimensions and market mechanisms.

#### **4.4. The non-market aspect:**

This means state intervention in the non-market dimension through labour laws, social dialogue between economic partners, collective bargaining, and other forms of intervention.

It should be noted that the state's intervention is not limited to the non-market aspect, but also extends to the market dimension of the labour market by setting the guaranteed minimum wage and mediating between supply and demand. (Hamdi, 2008, pp. 9-10)

## **5. International Indicators of the Labour Market:**

In its 1996 conference, the International Labour Organization (ILO) identified eighteen key international indicators for the labour market, as follows. (Mustapha, 2016, p. 92)

### **5.1. Indicator 1: Labour Force Participation Rate:**

The labour force participation rate measures the proportion of active participants among those within the working-age population. It indicates the size of the labour supply required in the production and service sectors.

### **5.2. Indicator 2: Employment-to-Population Ratio:**

This indicator shows the percentage of total employment out of the total population, i.e., the proportion of the labour force whose members are over 15 years old.

### **5.3. Indicator 3: Status in Employment:**

This indicator distinguishes between three categories of employment status: the first category represents self-employed individuals, the second represents wage earners, and the third represents unpaid family workers. Data are presented as percentages for each category of total workers, and for both males and females separately.

### **5.4. Indicator 4: Employment by Sector:**

This indicator classifies employment by sector, i.e., the agricultural, industrial, or service sector. Data are presented as percentages and by gender.

### **5.5. Indicator 5: Part-Time Workers:**

This indicator identifies the percentage of part-time workers out of the total workforce. A part-time worker is defined as someone who works fewer hours than a full-time worker, especially in seasonal jobs or during crises and natural disasters. Data are presented as percentages and by gender. (Al-Himyari & al, 2015, p. 104)

### **5.6. Indicator 6: Working Hours:**

This indicator includes three elements: the first represents those working marginal hours, i.e., less than 10 hours per week, the second represents those working excessive hours, i.e., more than 40 hours per week, and the third represents the total annual working hours.

### **5.7. Indicator 7: Employment in the Urban Informal Sector:**

This indicator includes the percentage of workers in the urban informal sector out of the total urban workforce.

### **5.8. Indicator 8: Unemployment:**

This indicator includes the percentage of unemployed individuals out of the total labour force, which includes the total number of unemployed and employed individuals.

### **5.9. Indicator 9: Youth Unemployment:**

The concept of youth includes the age group between 15 and 24 years, and adults are those over 24 years old. This indicator consists of four measures: the first represents the percentage of youth unemployment, i.e., the percentage of unemployed youth out of the total youth labour force, the second represents the ratio of youth unemployment to adult unemployment, the third represents the ratio of youth unemployment to the total unemployment rate, and the fourth represents the percentage of unemployed youth out of the total youth population.

### **5.10. Indicator 10: Long-Term Unemployment:**

This indicator includes two measures: the first represents the percentage of those unemployed for more than a year out of the total labour force, and the second represents the percentage of those unemployed for more than a year out of the total unemployed population.



**5.11. Indicator 11: Unemployment by Educational Level:**

This indicator includes the percentage of unemployed individuals, distributed by educational level into five categories: the first category represents individuals with less than one year of education, the second represents individuals with less than primary education, the third represents individuals with primary education, the fourth represents individuals with secondary education, and the fifth represents individuals with higher education. (Al-Hajj, 2003, p. 17)

**5.12. Indicator 12: Underemployment:**

This indicator relates to the number of individuals working fewer hours than they desire in an alternative job during a reference week. Information is presented as a percentage of these individuals out of the total labour force and out of the total employed population.

**5.13. Indicator 13: Inactivity Rate:**

This indicator represents the percentage of those of working age (25-54 years) who are not participating in the labour force.

**5.14. Indicator 14: Educational Attainment and Illiteracy:**

This indicator focuses on educational attainment and its distribution among the labour force, especially among youth. It includes four levels of education, in addition to the illiteracy rate among adult workers.

**5.15. Indicator 15: Real Manufacturing Wage Indicators:**

This indicator provides essential information on wage rate trends, reflecting individuals' living standards and working conditions. It also helps in preparing development plans and programmes.

**5.16. Indicator 16: Labour Compensation Costs per Hour:**

This indicator shows the levels and trends of employer compensation costs per hour for production workers. It is presented as absolute figures in US dollars, and by comparing percentages, it shows the country's relative position compared to the United States (dollar = 100 points). It also shows the amount of compensation that does not include workers' wages as a percentage of total compensation.

**5.17. Indicator 17: Labour Productivity and Unit Labour Costs:**

Productivity is defined as the output per unit of labour input, and labour costs are the cost of labour per unit of output.

**5.18. Indicator 18: Poverty and Income Distribution:**

This indicator combines various aspects and dimensions related to poverty and inequality. Information related to this indicator includes personal expenditures, personal consumption expenditures, and personal income for various individuals in a specific year or over a series of years. This indicator is useful in estimating the extent of poverty. (Shaker & Laiday, 2014, pp. 320-330)

**6. Actors in the Labour Market:****6.1. The State and Its Role in Labour Market Performance:**

The state has a crucial role to play in developing its markets as a partner, motivator, and facilitator of economic interactions. This requires an effective state, not a minimal state. Its role has once again come into the spotlight after the entry into the market economy. Recent developments, such as reforms in command and control state systems, financial crises, etc., have raised questions about what governments can and should do, all within the framework of balancing their role and the ability to achieve effective benefits, in addition to designing effective rules and restrictions to curb arbitrary actions, combat corruption, and subject state institutions to a greater degree of competition to improve performance. There are also insightful views regarding the appropriate mix of market and government activities, i.e., the integration of markets and governments. The state has a role in establishing the appropriate institutional foundations for markets, which can be summarized as follows. (Shahiber, 1997, p. 17)

**Improving the State's Institutional Capacity:** There are three sets of interconnected institutional mechanisms that can improve the state's credibility, responsiveness, and accountability:

**Constraints and Rules:** Strengthening formal constraint tools such as the independence of the judiciary and the separation of powers, which play a role in creating a suitable environment for the effective performance of markets.

**Expression of Opinion and Participation:** Mechanisms such as consultation councils between the public and private sectors and civil society provide an opportunity to express opinions on state activities, enhance participation between the state and its citizens, and allow stakeholders to provide input, oversight, and pressure for change.

**Competitive Pressures:** Competitive pressures from markets, civil society, and other state agencies limit the state's ability to exercise its monopoly in preventing policy and providing services. (Pradhan, 1997, p. 24)

**Strengthening the State for Its Markets:** Governments can encourage market development by clearly defining property rights and ensuring a sound regulatory framework, all of which are determined by their institutional capacity. The state and markets play complementary roles. The state is responsible for establishing the foundations for market development through:

- **Property Rights:** Markets cannot develop unless property rights are adequately defined, including the right to use assets, social arrangements that include imposing restrictions on illegal activities, protection from arbitrary government actions, and the existence of mechanisms for resolving disputes that are fair and predictable.

- **Information and Coordination:** Even with the availability of property rights, information and coordination problems may hinder market and private sector development. Information problems occur because the "rules of the game" may not be clearly defined. Business owners and individuals may lack knowledge about the trustworthiness and integrity of potential partners, or they may not be aware of profitable opportunities. Coordination is difficult because people and companies working for their own interests are generally not willing to share information. The state can reduce these problems through regulation.

## **6.2. Institutions Necessary for Labour Market Management:**

Douglas North describes institutions very broadly as the formal and informal rules that govern human interactions. What can be understood is that institutions focus on specific organizational entities, procedural methods, and regulatory frameworks. At a more intermediate level, institutions are defined by the degree of protection of property rights, the degree of justice in applying laws and regulations, the extent of corruption, and various problems that hinder their activity.

### **Measures of Institutional Quality for Effective Labour Market Performance:**

Measures of institutional quality can be typically identified in three relatively broad measures: the quality of regulation and governance, including the degree of corruption, political rights, public sector efficiency, and regulatory burdens; the extent of legal protection for private property and the good implementation of those laws; and the limits placed on political leaders. The first of these measures, the overall regulation and governance indicator, is the average of the six institutional measures developed by a 1999 study conducted by Daniel Kaufmann, Art Kraay, and Pablo Zoido-Lobaton. These measures include. (Haley, 2003, p. 36)

#### **Voice and Accountability:**

The extent to which citizens can choose their government and enjoy political rights, civil liberties, and a free press.

#### **Political Stability and Absence of Violence:**

The improbability of the government being overthrown by unconstitutional or violent means.

**Government Effectiveness:** The quality of public service provision, the competence and political independence of the civil service.

**Regulatory Burden:**

The relative absence of government dominance over markets, banking systems, and international trade.

**Rule of Law:**

The protection of people and property, the independence and competence of judges, and the enforcement of contracts.

**Control of Corruption:**

The absence of public power being exploited for private gain.

**The Role of Institutions in Labour Market Development:**

Among the main or root causes of economic development or in explaining the main reasons for differences in prosperity between countries is the "institutions hypothesis." Some societies have good institutions that encourage investment in human capital and better technology, thus achieving economic prosperity.

**A good institution has three main characteristics:**

Enforcement of property rights for a large segment of society, so that a diverse range of individuals have an incentive to invest and participate in economic life.

The existence of restrictions on the actions of elites, politicians, and other powerful groups so that they cannot seize the incomes and investments of others or create an uneven playing field.

The existence of a degree of equal opportunity for large segments of society so that individuals can make investments, especially in human capital, to enter the labour market with qualified and efficient hands, and contribute to productive economic activities. (Acemoglu, 2003, pp. 27-30)

**Third: Generative Professions in Light of Artificial Intelligence:****1. Smart Applications in New Professions**

Artificial intelligence has positive contributions, as it has brought improvements to many sectors and fields, contributing to increased production, whether in material or service production sectors, as well as in preventing crimes, especially cybercrimes, and developing education and healthcare services, especially during pandemics, which was achieved during the COVID-19 pandemic. In addition to its contribution to building and developing smart cities and digital governments.

United Nations agencies use artificial intelligence, such as the World Food Program's Hunger Map project, which collects data to identify areas sliding into hunger. It also works on developing remotely controlled trucks to deliver emergency aid in dangerous areas. The education market is expected to grow to four billion US dollars by 2023, with a compound annual growth rate of about 74%, due to the size of the artificial intelligence market in the education sector. (Al-Azab & Al-Nashar, 2022, p. 16)

Artificial intelligence, robotics, and other forms of intelligent automation have the potential to achieve significant economic benefits, contributing up to \$15 trillion to global GDP by 2030, according to an analysis by PricewaterhouseCoopers. This additional wealth will also generate demand for many jobs, but there are also concerns that it may replace many existing jobs. (Gillham, 2018, p. 3)

In China, the impact of artificial intelligence on productivity will be crucial for future growth in the Chinese economy. According to a report by the McKinsey Global Institute, AI-driven automation can give the Chinese better economic opportunities - increased productivity would add 0.8 to 1.4 percentage points to annual GDP growth, depending on the speed of adoption of AI systems in the economy. But progress is not only happening on the theoretical boundaries of this field; tools that use machine learning are the cells of tomorrow's super-intelligent systems, and many of them are already on the market, and their use is growing rapidly in sectors such as finance, healthcare, and manufacturing. (Barton, Woetzel, Seong, & Qinzheng, 2017, p. 01)

It is worth noting that there is also great potential to benefit from generative AI technology in many workforce activities performed by workers in education, health, social work, manufacturing, and wholesale trade. Retail trade industries constitute the largest share of work activities that are likely to be transformed by generative AI. A research study on the impact of artificial intelligence on the economy indicated the possibility of boosting GDP by 10% in the third decade of the current century, and increasing productivity through artificial intelligence. (Nouzad & Al-Hiti, 2023, p. 97)

Currently, more than 50% of major European manufacturing companies apply artificial intelligence in their factories. Germany leads with about 69% of manufacturing companies. In Asia, specifically in Japan, the percentage is about 30%, followed by China with 11%, and in the United States, the percentage is about 28%.

A survey conducted by the info Institute for Economic Research in Berlin revealed that more than 13% of companies operating in the German economy use artificial intelligence, and another 9% of companies announced their intention to use this technology. The results showed a significant spread of this technology in the industrial sector; the results highlighted that one in three companies in this sector uses or intends to use artificial intelligence. According to the results, this percentage reached nearly 20% in service providers and trading companies, and 15% in construction companies. In contrast, the results revealed that about 40% of companies in Germany are not interested in artificial intelligence technology at the moment, and this percentage reached 60% among construction sector companies. (Nouzad & Al-Hiti, 2023, p. 98)

Artificial intelligence allows for the automation of processes, the development of new products and services, and the improvement of quality and efficiency. Artificial intelligence also has the potential to impact almost all sectors of the economy and all aspects of trade, especially service trade. Artificial intelligence will have the greatest impact on the routine matters in information-based jobs and business functions related to lending, processing accounts, or analyzing medical tests, among other things. At the same time, artificial intelligence can support trade on a wider scale by improving trade facilitation and promotion. Both applications help more companies engage in trade, especially medium, small, and micro-enterprises, where time and cost are reduced and export opportunities are provided. Artificial intelligence will be at the heart of facilitating digital trade; where the use of modern communication technology simplifies the movement of goods across borders, and the World Trade Organization estimates that inefficient customs procedures account for about 6% of the total variation in trade costs. (World Economic Forum, 2020, p. 18)

The highly interconnected and digital production facility that relies on intelligent manufacturing is called a "smart factory," and the idea of a "smart factory" is the result of the Fourth Industrial Revolution. Most smart factories are adopted by the manufacturing industry, which uses state-of-the-art technologies such as robotics, big data analytics, artificial intelligence, and the Internet of Things. These factories can self-correct and operate independently on a large scale.

The smart factory market includes, by product: machine vision systems, industrial robots, controllers, sensors, communication technologies, and other products; and includes, by technology: product lifecycle management, human-machine interface, enterprise resources and planning, distributed control system, programmable manufacturing execution system, programmable logic controller, supervisory control and data acquisition, through the end-user industry. (Nouzad & Al-Hiti, 2023, p. 105)

## **2. Challenges of Artificial Intelligence and Its Impact on Traditional Professions:**

Increases in the technical capabilities of artificial intelligence systems have led to increased rates of its spread in companies, governments, and other organizations. The increasing integration between artificial intelligence and the economy comes with concern and questioning: will wages increase or will it lead to widespread worker replacement? To what extent do companies adopt new artificial intelligence technologies and want to hire workers skilled in artificial intelligence? And will governments adopt policies that encourage the use of artificial intelligence applications in various sectors?

Recent global estimates indicate that 30% of work activities could be automated by 2030, which could affect nearly 375 million workers worldwide, whether blue-collar or white-collar workers, and the former does not necessarily bear the greatest burden: jobs that artificial intelligence can

easily replicate and replace are those that require recently developed skills such as logic and algebra, and they tend to be middle-income jobs. Conversely, jobs that artificial intelligence cannot replicate are those that rely on deeply developed skills such as mobility and perception, and they tend to be low-income jobs. Thus, artificial intelligence empties middle-income jobs and maintains many low-income jobs. (UNESCO, 2021, p. 16)

There is concern around the world about the disappearance of jobs in favor of robots and artificial intelligence. Is there a basis for this fear? And what is the percentage of these jobs that the machine can perform? It is worth noting here a difficult fact that the percentage of jobs that disappeared from the industrial and agricultural sectors during the Third Industrial Revolution was absorbed by the service sector. Will a sector appear that we do not know today that can absorb hundreds of millions of unemployed people as expected? In any case, a tour of some studies enables us to observe the following:

There is a noticeable discrepancy in statistics between one study and another about the percentage of jobs that can disappear; a study conducted at Oxford University in 2013, which included 702 different jobs in the United States, concluded that machines will be able to perform about 47% of these jobs in the next decade or two. (Majouz, 2020)

In another study conducted by the Organization for Economic Cooperation and Development in 2015, which included 34 countries, most of which are developed countries, it was found that 14% of jobs in the organization's countries are at high risk, and 32% are at lower risk. The study concluded that 210 million jobs in 32 countries are at risk. (Majouz, 2020)

A comparison of job disappearance between developed and developing countries indicates that jobs in developing countries are at greater risk than those in developed countries. The Slovak Republic may lose twice as many jobs as Norway. South Korea will lose fewer jobs than Canada because production management is different between the two countries, as the former is already advanced in automation compared to many countries.

The Future of Jobs Report issued by the World Economic Forum in May 2023 indicated that employers expect to create 69 million new jobs by 2027 and eliminate 83 million jobs, which will lead to a net loss of 14 million jobs, or 2% of the current total employment. Massive disruptions will shake the global labour market over the next five years with a weak economy and increased adoption of new technologies by companies such as artificial intelligence.

"Several factors will fuel labour market disruption during the 2023-2027 period. The transition to renewable energy systems to achieve carbon neutrality will be a strong driver of job creation, while slowing economic growth and rising inflation will lead to severe losses in the labour market. At the same time, the rush to deploy artificial intelligence will be a positive and negative force. Companies will need new workers to help them implement and manage artificial intelligence tools. Employment of data analysts, scientists, machine learning specialists, and cybersecurity experts is expected to grow by 30% on average by 2027. At the same time, the spread of artificial intelligence will put many jobs at risk, as robots replace humans in some cases. The World Economic Forum predicts that record-keeping and administrative jobs will decline by 26 million by 2027. Data entry clerks, executive and administrative secretaries, accountants, and payroll clerks are expected to suffer the largest losses in the global labour market.(World Economic Forum, 2023, pp. 30-31)

**Table Showing the 10 Fastest Growing and 10 Fastest Declining Jobs in the World 2023-2027:**

<b>Fastest Growing</b>	<b>Fastest Declining</b>
1. Agricultural Equipment Operators	1. Data Entry Clerks
2. Heavy Truck and Bus Drivers	2. Administrative and Executive Secretaries
3. Vocational Education Teachers	3. Accounting and Payroll Clerks
4. Mechanics and Machinery Repairers	4. Security Guards
5. Business Development Specialists	5. Building Superintendents and Housekeepers
6. Construction Structure and Related Trades	6. Cashiers and Ticket Clerks
7. University and Higher Education Professors	7. Material Recording and Inventory Clerks
8. Electrical Technology Engineers	8. Assembly and Manufacturing Workers
9. Sheet Metal, Structural Metal, Mold, and Welding Workers	9. Postal Service Workers
10. Special Education Teachers	10. Bank Tellers and Related Workers



"The expansion of online banking services has contributed to the closure of many physical bank branches, causing bank teller and related jobs to decline by approximately 40% before the end of the current decade, which is the fastest rate. Similarly, the increasing impact of automation, sensor technologies, and online services is reducing the need for postal service clerks, cashiers, ticket clerks, and data entry clerks; these professions are expected to decline by more than a third in the next five years.

Regarding the highest absolute job losses, data entry clerks are the worst affected, with an expected loss of 8 million jobs within five years, followed by administrative and executive secretaries, accounting, payroll clerks, and journal clerks. The Future of Jobs Report 2023 indicates that these three professions combined account for more than half of the total expected job losses.

Looking at history, we find that disruptions or changes resulting from automation cause a lot of chaos in the short term, but they create more jobs in the long term. Research published in 2021 confirms that 60% of the jobs we know today did not exist 80 years ago; and that entirely new industries have emerged due to computers, the internet, and other modern technologies, leading to the emergence of entirely new industries from cars to computers, and an increase in new jobs from drivers to web developers. (Majouz, 2020)

Economists and futurists have accurately predicted jobs at risk of disappearing, but they have not been as accurate about the jobs that will emerge due to the world's shift towards AI applications, because this is related to the reality and future of education, which must take into account the fact that the current educational system is based on the industrial economy, which is currently being automated, and it must keep pace with the current and expected developments in light of the accelerating pace of the industrial revolution, of which artificial intelligence is a major pillar.

The automation process also improves the productivity of already automated tasks. This means that machines become more efficient in the tasks they previously performed, which enhances overall productivity and increases the demand for labour. For example, let's assume that a retail store implements automated payment systems, allowing customers to pay for their purchases without the need for a human cashier. This process is characterized by speed and efficiency, which reduces customer waiting times and improves their overall experience. Here, the store will face an increase in customers and sales traffic, and therefore may need to hire more employees to perform other related tasks, such as product management or helping customers with their inquiries, and of course, to maintain and further develop the automated payment systems. What happened then is that the automation process created new tasks that are more suitable for humans than machines in various industries such as factories, engineering, management, accounting, and others. Similarly, artificial intelligence may create new tasks in many service sectors in the near future. Generative AI technologies, in particular, will change the labour market; because they will simply change the form and nature of jobs and tasks themselves.

## **CONCLUSION:**

The entry of artificial intelligence applications into various professions and businesses will change the basic skills required for jobs, and new skills will replace them; which means that many jobs will be redesigned due to artificial intelligence tools, especially AI tools and applications. As a result, artificial intelligence represents both a challenge and an opportunity for most professions and jobs, as people must be aware of and adapt to new technologies to benefit from their advantages and enhance their role in the institutions they work in.

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