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DIGITAL TRANSFORMATION AND THE POTENTIAL FOR LABOR MARKET RESPONSE IN IRAQ

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Abstract:

The rapid technological booms that the world has witnessed since the 1990s have produced an era of radical changes and harbingers of the emergence of information and communications technology, artificial intelligence, the Internet of Things, and others. These profound transformations are driven by a revolution of technologies in several fields, that have cast their shadows in the reshaping the economic system, and the accompanying effects. Clear and evident in labor markets, which were coupled with unprecedented developments, especially in the areas of harnessing technology to expand the scope of services, and became the driving force for bringing about structural changes in countries' economies and individuals' lifestyles and relationships. The research aims to investigate the foundations of the digital economy and the sustainability of the competitiveness of the labor market in Iraq, allowing for the building of a workforce with digital technological skills that respond to new employment requirements, through the hypothesis that stipulates the adoption of a package of macro policies to mitigate the severity of the repercussions of the digital divide on the structure of the labor market in Iraq . The research reached a number of conclusions, which serve as a reflection of how the digital revolution has transformed the labor market and how universities can support students in order to enhance their employability, as well as recommendations that highlighted the need to improve the efficiency of the education system and ensure a balance between the outcomes of the educational process and the requirements of the new labor market. To prepare cadres who are aware of future digital trends, have the necessary skills, and are better prepared to comply with the conditions of these jobs.

Keywords: Digitalization, Employment Market, Job Skills

INTRODUCTION

The rapid developments witnessed by the world, which cast a shadow in the development of information and communication technology, have become to make knowledge a productive element along with other elements of production approved by economic thought, and this development has had an impact on other markets such as financial markets, trade money, labor, ... And the rest of the economic joints, generating a set of positive effects, whether at the level of the economy and the environment or at the level of society and the individual. Labor markets are a responsive space to the economic, social, technological and knowledge developments of any country's economy, allowing to raise the pace of economic growth, bring about structural changes, upgrade human capital, and establish a sustainable knowledge-based diversified economy. The high rate of participation in economic activity among those

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of working age would reflect the degree of efficiency of the economy in expanding employment opportunities, laying the foundations of decent work, spreading its culture in the sectors, respecting work values and standards, and consistent with population policies and development plans as an objective condition for sustainable development. The economically active population represents the labor force available in the economy and their ages fall within the age group (15-64) years, and the high rate of their economic participation indicates the state of progress towards job-generating growth, and Iraq will enter the stage of demographic endowment within the year 2037, and with it, the economically active population group will reach about (67%) and the youth population group (15-29) years about (37%) of the total population. This requires upgrading appropriate policies and mechanisms responsive to knowledge progress in Iraq, in order to bridge the digital divide and allow making the workforce characterized by technological skills that qualify it to receive new jobs.

The importance of research: Discovering the relationship between the development of the digital economy and labor markets in order to establish a digital labor market responsive to the developments of digital transformation.

Research problem : Globalization, industrialization and digital transformation have led to structural changes in the economy and labor markets, as digitalization, which covers all areas of human activities, has produced changes in the way people work and the conditions that govern their work. Instead of long-term contracts in the past, digital technology is now leading through electronic platforms on the Internet to the emergence of more short-term jobs, the disappearance of professions based on routine operations and the emergence of specializations with administrative and creative competencies. Hence the expansion of The digital divide will deepen imbalances in the Iraqi labor market and the emergence of structural unemployment in many economic activities due to the weak response of the labor market to digital transformations, and the possibilities of achieving the two goals (8 and 9) of the sustainable development goals in achieving decent work, innovation and economic growth will be carried over for an unlimited period.

Research hypothesis: Adopting a package of macro policies that will mitigate the repercussions of the digital divide on the structure of the labor market and trends in demand for the labor force in Iraq.

Research Objective: To shed light on the educational policy in Iraq to ensure that it responds to the basic requirements of the labor market and future demand trends in the context of the development of the foundations of the digital economy.

Research Methodology: The inductive approach and the descriptive analytical method were adopted by reviewing the theoretical framework of the digital technologies literature in the context of the increasing demand for new skills, using analytical tools for available data and their interpretation to reach results that reflect the role of higher education in ensuring the ability to develop methods of analyzing existing competencies, and predicting the demand for new competencies based on the prospects for scientific and technological progress.

The first axis

The digital economy and its developmental role

First: The concept of the digital economy.

The rapid spread of information technology media and the use of electronic media and the radical changes they have brought about in human lifestyles led to a change in the ways and means of implementing economic activities and collapsed accordingly traditional economic restrictions and limits, as natural resources are no longer the main and only key to economic development, as this resulted in the emergence of a new type of economy called the digital economy, or the information economy and represents a different thought, trend, philosophy and practice from the industrial era, and expresses a future vision for a world that is Information is the main pillar of the economy, as the global economy has become dependent on information in addition to modern technology, especially since all the tremendous technical developments at the present time depend on digitization, that is, the expression of data and information in chains consisting of the two numbers (0, 1) called binary or digital chains, with which the new economy is associated (Qasim, 2017: 22). He explained the new phenomenon that has entered the economy into the circle of productivity and continuous growth and the establishment of digital smart societies that adopt information and communication technology as a raw material in all regions (governments, the business sector, citizens). The digital economy is a wide range of economic activities that include the use of digital information and knowledge as a key factor for knowledge production, modern information networks as an important activity space to manage, and the effective use of information and communication technology as an important engine for productivity growth and improvement of economic structure (Rumana & Richard, 2017: 8) allowing for effective linkages between the parties to economic activity through the flow of information, goods and services and the movement of capital in order to access markets regardless of where they are located. Its time, based on electronic processing, storage and transmission of information including activities provided by the physical infrastructure and enabling the necessary software for it. It is thus based on digital information technology, and employs knowledge in its management, as a

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new resource and source of inspiration for new innovations and deals with digital information, digital customers, digital companies, digital technology, digital products (Al-Razzo, 2006: 13) As a result of these developments, everything has become digitizable, and the storage, processing, retrieval and transfer of data has become easier, faster and less expensive, allowing the information necessary to make appropriate decisions, invest opportunities and generate new value chains, in addition to that, digital transformation has contributed (Digitalization) to a transformation into an economy based on digital data and uses digital technologies that express all electronic tools, systems, equipment and resources that generate, store, retrieve, transfer and process digital data, and to transform the economy under the Internet from a traditional economy with limited job opportunities in light of limited resources, capital and acceptance of material consultations, to a pioneering economy characterized by the explosion of business opportunities with limited resources, which makes the new economy abundant and abundant in Ideas, talents, resources and even job opportunities from certain angles or regions (Najm, 2004: 88), which is reflected in facilitating the lives of individuals and increasing well-being by improving competitive positions with the element of time, cost and effort such as government services, education services, health, shopping, travel and entertainment (Najjar, 2009: 300).

Second: Knowledge development according to economic theories

The Industrial Revolution is the cornerstone of scientific knowledge and the emergence of economic innovations and inventions and the emergence of knowledge in its true nature has contributed to the creation of tangible developments in the economy and the beginnings of this trend can be felt through the writings of thinkers of the classical school (Adam Smith, Ricardo, Malthos, Mill) by emphasizing that the change in the production of goods is achieved when a change occurs in one or all of the elements of production, which is one of the changing elements, either natural resources are fixed, and the production function is subject to the law of yield Diminishing (Sharar, 2002: 24) and that this assumption is correct with the stability of technology and capital, but the driving force of economic growth is based on technology and capital accumulation where there is a reciprocal relationship between them and that the main motive for the expansion of production is based on profits that are determined under the markets of complete competition in light of the reduction of production costs that are affected by many elements, most notably technological development, which allows the possibility of producing new goods, which will lead to the expansion of labor markets and increase the production capacity of other factors of production. Hence, the growth of human knowledge and skills through education and its contribution to economic development (Nujaifi & Quraishi, 1988: 51) while neoclassical growth theory believes that technological development has led to the improvement of production methods, which pushes to open new markets and increase the demand for workers, and that economic growth requires a focus on specialization, division of labor and freedom of trade (Khalaf, 2006: 127) Since it is the human being who produces technological knowledge, which is one of the factors that stimulate innovation to achieve economic growth and become Knowledge is the main factor of production, the development of new means of communication and the digitization of information will have an impact on the capacity of information transmission, storage and processing, thus eliminating borders and barriers to become a fully open economy (Strac, 2008: 41) and that the lack of scientific and technological progress makes man face problems that limit his development and this explains the reciprocal relationship between them (Morsi, 1990: 28). This prompted the economist Robert Solo to emphasize the importance of technological progress and that the essence of his theory emphasizes innovation that searches for the best ways to use educational resources financially, humanly, technologically and temporally in order to qualify the human element with education and training, and that technological factors would stimulate innovation to achieve economic growth, and thus the technical factor is considered as an external variable that contributes to moving the production function as well as the participation of labor and capital (Al-Kaabi, 2019: (54)Technology has a significant impact on economic growth. This prompted scientists and thinkers to emphasize the importance of the accumulation of human capital and its role in production, stressing the emergence of new determinants of economic growth based on investment in human capital and technological development, especially since human capital has become the third pillar of productivity growth in the knowledge economy after physical capital and technology (William & Alan, 2003: 491).), because ideas can be renewed, used and collected without restrictions, they are not subject to the law of decreasing returns, as production will increase with the increase in inputs from labor and capital at a certain level and then take a decline, but the quality of goods and services increases as the level of education of workers rises. Therefore, in order for economies to grow, dependence on material resources should be reduced and knowledge base based on catalysts such as research and development, education system, economic prospects and market openness should be expanded. Since advances in modern technology generally occur as a result of organized investment in R&D and human capital, which requires the sacrifice of additional investment expenditures.

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Third: Characteristics and foundations of the digital economy The digital economy is characterized by working to build the information society by harnessing information and communication technology in order to achieve many development goals, especially since the balance of the economic institution has become based on its knowledge and information stock, so it needs continuous development and innovation in the information and knowledge index, so a set of advantages and characteristics of the digital economy have emerged, the most important of which are: (Jassim, 2017: 198)

1- The law of digital assets does not resemble physical assets and is not consumed when used, as companies can create value from the use of these assets in an infinite number of transactions, which requires changing the competitive mechanism in their field, so that companies bear the cost of the first preparation of information so that the additional cost when reproduced digitally becomes closer to zero, and this is what is expressed by the law of increasing returns in the field of digital assets versus the law of decreasing returns in relation to physical assets or goodsOne study showed that increasing the digital development index by (10%) leads to an increase in the growth of average GDP per capita by between (0.5%) in non-developed countries in digital transformation and about (0.62%) in developed countries (Sabbagh, 2018: 91).

2- The economics of the new size: The traditional economies of scale are based on the production of small size through small companies, and the size expands for economic reasons as the demand for their products increases, the provision of banking services by banks requires the provision of an employee for each deal that is worked on for the benefit of customers, otherwise the waiting line will increase, but with the availability of the Internet allows the possibility of conducting all transactions and for all those dealing with the bank at the same time, which facilitates the performance of commercial transactionsImproving employment rates in labor markets, especially for highly skilled people (Stefan, 2014: 180) and that the increase in digital transformation measured by the proportion of the adult population who use the Internet to pay bills leads to a decrease in unemployment rates in various countries, as increasing Internet use by one percentage point in a country leads to a decrease in the unemployment rate ranging between (0.15-0.27) percentage points (Daniel & Marwane, 2020: 91), and the net impact of digital transformation on employment depends on the characteristics of the labor market and the ability of the economy to adapt to that transformation. Effective participation in this network requires the need to provide infrastructure in the economy such as electricity networks, high-speed communication networks, and others (Salah & El-Sayed, 2020: 7).

3- The future of macroeconomics: services can be provided through digital assets for everyone in different and disparate fields and markets, while the economics of the industrial era were working to produce a number of diverse products on production line machines, and despite thedevelopments, they continued to suffer from poor diversity and flexibility, which limits their ability to respond in a timely manner , but in light of the digital age New enterprises have a comparative advantage in the use of new technologies, provide them with sufficient space to grow and expand their operations rapidly, and will have a wide range of access to information about markets, tastes and choices of consumers and to attract skilled labor (Andrews & Criscuolo, 2013: 178). The success and growth of the digital economy depends on the ability of individuals and institutions to participate in various information networks and websites. Therefore, the phenomenon of short-term contracts (Gig Economy) instead of permanent jobs has spread in the labor markets (Awish & Khozam, 2021: 235).

4- Cost pressure per deal: The Internet has led to a new state of making deals and new business models (such as the Amazon model), which pushes to double the total volume of activity in an unprecedented way and increases the opportunity to achieve profits, unlike companies that avoid small deals, as the cost of performing them may be greater than the return achieved.

5- Rebalancing supply and demand: In the digital world, there is an increasing shift from a supply-based focus line to a demand-based line, and one of the priorities of system-based companies is to guess what the customer wants, which means that there is excess capacity and capabilities that make supply in its various forms abundant and that demand, despite its distinction and breadth with the Internet across the world, is scarce.

6- The digital economy is a high-speed economy: its means are satellites and e-mail, this speed has led to companies being agile in size and organization by organizing network relationships and sharing instant information, which increased the speed of business. Unlike the traditional economy in the industrial era , which is characterized byslow movement and its means are railways, cars and traditional mail.

7- The cost of the digital product: The cost of the digital product has unique characteristics, asthe cost of digital products has a different structure and behavior from the physical product, as it can be reproduced with a high degree of efficiency and at a very low cost. Unlike physical products, manufacturers must make significant investments in a new plant or machinery to meet the growing demand.

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8- Efficiency and leverage: The Internet has created superior capabilities for open communications with an infinite number of beneficiaries on the face of the globe, which led to the expansion of the volume of transactions and exchanges, and then companies and individuals have great options for supply and profits, and the Internet as a superior technology has created a great wave of networking that maximizes the performance of the network in terms of the crane of the devices working on it.

Fourth: Digital Economy Indicators

The digital economy is characterized by continuous development and change, which was reflected in the development of the concept and indicators of the digital economy based on several global indicators represented in the following (Al-Tahhan et al., 2023: 1008)

1- Knowledge Economy Index: This indicator contains more than (80) variables that countries can use as a basis for their transition to the knowledge economy through a standard scale ranging between (zero, 10) according to two indicators, the first represents the indicators of measuring knowledge in general, represented in the index (information and communications, education and training, innovation), while the second measures indicators related to the economic incentive system, which expresses (customs and non-tariff barriers, the quality of laws and legislative regulations).

2- ICT Development Index: It is related to the evolution of the digital economy , the level of ICT development and evolution over time in countries, and knowledge of the digital divide compared to those countries in terms of levels of ICT development. It includes three sub-indicators (access to ICTs, ICT use, skills).

3- Global Innovation Index: measures outputs and inputs in innovation processes, innovation policies, the extent of partnership between industry and science, and the spread of knowledge. It covers two main indicators: innovation inputs (development of the business and market environment, human capital and research, infrastructure and institutions), and sub-indicators of innovation outputs (creative, knowledge and technological outputs) (GIR, 2019: 207)

4- Global Competitiveness Index: A comprehensive tool that measures the microeconomic and macroeconomic foundations of local competitiveness, and this indicator is determined through (12) sets of indicators represented in the basic requirements (institutions and infrastructure, adoption of information technologies, stability of the digital economy), human capital represented in (health, skills), as well as markets and was expressed through markets (products, labor, finance, market size) and the innovation environment (innovation capacity, business environment dynamics) (GCR, 2019: 2)

5-E-Government Development Index: Shifting all government activities, procedures and transactions from manual methods to electronic technology in order to provide more effective services and allow the high quality of government performance by completing transactions electronically and saving time and money at the national level, whether government to government, or government to citizen.

6- Network Readiness Index: Shows the readiness of countries to effectively leverage ICTs to enhance competitiveness, including (people, impact, governance, technology) (RNI, 2019: 13)

The second axis

Indicators and indications of the Iraqi labor market

First: Labor Market Performance Indicators in Iraq

Economists have used a number of economic indicators to express the labor market, and these indicators are quantitative and qualitative tools that monitor technological changes or progress that occur in a phenomenon belonging to the labor market system, and some indicators will be addressed as a criterion for the Iraqi labor market (Nashour, 2017: 140).

1- Job supply indicators

A- Population size and age composition index: The demographic composition of the population is necessary to know the performance of the labor market, and according to available statistics, the population growth rate in Iraq is about (2.5%) in 2022

B- Participation rate by skill and competence: The labor market is directly affected by the outputs of the educational process, meaning that the qualitative characteristics of the job offer change with the increase in the outputs of education at its various stages and the transfer of these outputs to the labor market, and the participation rate indicator by educational level was used to indicate the scientific status of the labor force at ages (15) years and over (Al-Ani & Al-Nasih, 2010: 145) and through the data available during the period (2003-2021), the labor force lags behind in skills related to the needs of the digital market, despite The illiteracy rate is declining and constitutes as an average for the period studied does not exceed (20%), which is the lowest percentage of the labor force, compared to the high percentage for the rest of the qualifications, especially holders of university degrees, diplomas and

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bachelor's, which are not less than an average of (80%) during the period studied, but they do not comply with the requirements of the labor market, which made the labor market suffer from a deficit in some professions and specialties required by the economic development process

2- Indicators of demand for work and includes a set of indicators, including:

A- The employment rate reflects the ability of the economy to use the existing labor force and that the weakness of this rate is an indication of the waste of one of the elements of production, and the category of workers according to the definition of the Arab Labor Organization includes anyone who works even one hour a week or a day, and also includes people who are temporarily absent from work such as patients, and according to the available data, the employment rate in Iraq during the period (2003-2021) ranged between the lowest rate (32%) and the highest rate (48%) (Statistics Authority and Systems Geographic Information, Living Conditions Survey) This is due to the fact that the population in Iraq is growing at a greater rate than the growth rate of employment opportunities as a result of weak economic activity and limited new projects that absorb the available labor force.

B- The employment rate index by sex, which shows participation in economic activity, and in Iraq, the relative gap between the male participation rate compared to female participation is increasing, according to the data available during the period (2003-2021), it is clear that the employment rate of males aged (15) years and over is not less than (72%), while the employment rate for females did not exceed (23%) (Statistics and Geographic Information Systems Authority, Poverty Survey and Evaluation for the year 2021) This is due to cultural and social reasons and societal constraints that women are responsible Although Iraqi women have made strides in the field of education and possess skills that qualify them to compete in the labor market, their economic activity rate is still low and they remain concentrated in some professions and not others.

In light of the above, it is clear and through the indicators of labor supply and demand for it, it is clear that the growth of supply is rising at a faster pace than the growth of demand, and this imbalance led to the emergence of the problem of unemployment, which was not limited to its high rates only, but in its characteristics to include large segments of young graduates and job seekers and the consequent consequences affecting security and social stability resulting from the failure to keep pace with developments and investment in new technology and its products and ways to integrate women and youth into the new economy.

Second: Characteristics of the labor market in Iraq

The labor market in Iraq is characterized by high unemployment rates, especially among young people, and these rates increase with the increase in the level of education, as well as the absence of a coordinated information and technological system for the digital labor market, in addition to the spread of administrative and financial corruption, which has become an inherent institutional structure instead of a phenomenon.

There are some characteristics of the labor market in Iraq that are associated with technological development (Hamad, 2009: 48).

1- Labor market fragmentation Labor markets in Iraq are characterized by fragmentation between formal and informal sectors, work in the formal market is the jobs organized and offered by the public sector, which is the largest source of employment, or the private sector, where workers practice their activity in exchange for an agreed wage according to the terms and an employment contract that ensures the maintenance of the worker's legal rights and other guarantees that the worker needs to practice his activity with confidence and safety. The participation of males in the economic activity of the private sector is greater than in comparison with the participation of women. As for the size of the informal sector, it ranges between high and low with low productivity and low wages, and that the labor force is characterized by its inefficiency, which constitutes as an average percentage during the period (2003-2021) about (67%) of the size of the labor force compared to the organized private sector, and to constitute a percentage of not less than (25%) in the composition of GDP, and this indicates that there is a leakage from the income and production cycle estimated at about a quarter of GDP, in addition to that two-thirds of the labor force does not pay Social security arrests and private enterprises do not pay tax dues, depriving the public treasury of financial resources that can be used to cover the expenses of basic services.

2- The incompatibility of education outputs with the requirements of the labor market, as unemployment rates in Iraq are rising, especially among graduates, and the highest unemployment rate was concentrated among university degree holders, according to the available data, that the percentage of the total workforce of holders of the highest degrees reached an average for the period (2003-2021) not exceeding (40%) compared to the total workforce of holders of the lowest degrees, and this reflects the mismatch between education outputs and the needs of the labor market, as well as the reluctance of institutions and companies to employ Holders of higher degrees due to their lack of the required qualifications and their distance from the changes witnessed by the labor markets, which is related to

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the orientation of education towards quantitative achievement and not qualitative with the decline in levels of quality and efficiency, as well as the reluctance of some degree holders to work in places that do not suit their qualifications.

Third: Digital Readiness Indicators in the Iraqi Labor Market

The importance of ICT in various areas of development lies in the provision of infrastructure and qualified cadres as well as encouraging investments, which will have a significant impact on the development path in Iraq, along with trade in ICT products, which will lead to increased regional cooperation and open horizons for cooperation between developing countries in research, development and knowledge projects and use them to achieve sustainable development and seek to narrow the digital divide between them and developed countries. The general average indicator of technological penetration is recognized based on the average of the following indicators:

1 - Human capital , which refers to individuals working in labor markets and among them there are intellectual assets to create innovations that are the basis for the existence of products and services for the labor market and their innovations, which can be converted into profits and in a way that achieves more value through competitive advantage. Human resources are divided between companies, industries and professions based on the skill of individuals using information and communication technology, and this indicator is measured through sub-indicators as follows:

A- Percentages of data related to education, training and development to acquire skills and experience effectively to develop practical skills (Ayoub & Abed, 2013: 132) When analyzing the reality of education in Iraq in general, it is clear that there is no institutional relationship between the providers of training and employers, meaning that the entities that carry out the training do not have actual evidence that what they teach helps in employment. The percentage of education and training in Iraq is estimated at about (5%) (ESCWA, 2022: 29) Despite the high education index, it is still lower than the goals and aspirations as a result of illiteracy, dropout and the decline in the quality of the school environment (Ministry of Planning, 2021) The Global Education Quality Index for 2021 also showed that there are six Arab countries (Syria, Iraq, Yemen, Libya, Sudan, Somalia) that have departed from the global assessment of the quality of education because they lack quality standards, and the UAE has topped an advanced position, and Turkey and Chile have recorded the most intense activity. Online in the field of training skills, followed by Finland, the Netherlands and America. The main driver of economic activity is education, which accounts for 58.8% of the total activity and is essential for the labor market and future employment (UNDP, 2022: 44).

B- Indicator of the percentage of individuals with Internet access, centers that allow the public to access the Internet (Internet cafes, libraries, training centers, ...), and the general percentage of Internet access is calculated through the following: Number of facilities with Internet access / Total number of facilities in the country * 100. According to the labor market assessment and skills analysis in Iraq for the year 2021, the age group between (20-24) years (the digital generation) is the one that uses the Internet more than others by more than (25%) compared to Internet users, followed by the age group between (25-29) years of about (23.9%) This indicates that about (17%) of the Iraqi population uses the Internet, and compared to the rest of the countries, Sweden leads those countries by (96%), followed by the UAE and the United Kingdom (94%) respectively, and despite the recent increase in Internet use in Iraq, it still lags behind other countries in obtaining the Internet (UNESCO, 2021: 58).

C- The index of individual ownership of a mobile phone, which uses cellular technology that provides access to the public switched telephone network, and is calculated through the percentage of individuals that have a mobile phone by dividing the number of individuals that own a mobile phone by the total number of individuals multiplied by a percent, and according to the available data, the population of Iraq depends heavily on mobile phones, as the percentage of mobile phone ownership in Iraq has witnessed a significant improvement since 2003 and until now, through the increase in the total number of subscribers to the lines Mobile phone (Zain, Asiacell, Korek), which was reflected in the increase in telephone density per (100) people for mobile phone lines, reaching (104.5%) in 2022 (Communications and Transport Statistics, 2023: 13) Japan leads in mobile phone ownership, which reached (141%), followed by Bahrain (133%) and Argentina (132%) (UNESCO, 2021: 54)

D- Computer use index, which is the percentage of individuals who use the computer, whether at home or work, and through the available data, approximately (30%) of families in Iraq have a computer, and this is a weak indicator compared to the countries of the world, as the UAE leads by owning a computer, which reached (100%), followed by the United Kingdom by (99%) and Sweden by (92%) in 2022.

E- The indicator of employment in electronic professions, which constitutes between (3-5 %) of the total employment in Iraq because individuals do not have the ability to work in the ICT sector due to the lack of skills and competencies required and synchronized with the Iraqi labor market (UNESCO, 2021: 50)

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From these sub-indicators, the average technological penetration of labor markets in Iraq is determined according to the human capital index, which reflects the size of the gap between Iraq and the rest of the countries, which does not exceed (31%), which is a rather low percentage.

2- **Business Index**, and this indicator is calculated based on the sub-indicators that affect investment decisions, which are as follows:

A- The indicator of the percentage of wireless broadband coverage for enterprises, which includes analogue and digital systems and technologies such as international communication systems of the advanced generation, and this is calculated by dividing the number of institutions with wireless coverage by the total number of institutions multiplied by a percent (United Nations, 2005: 12), and the technological penetration rate of fixed broadband subscriptions per 100 inhabitants in Iraq reached (11.7%) in 2021, which is a low percentage compared to the rest of the countries in France (44.8%) and in Belgium (39.2% Austria (28.4%) Bahrain (11.8%).

B- The index of the percentage of business enterprises that use Internet speed to IP-based networks measured in units (MB) and calculated by dividing the number of businesses that use the Internet by the total number of business establishments multiplied by a percent, as it reached in Iraq (45.4) megabytes, which is a modest percentage compared to the State of Qatar fifth globally in Internet speed and at a rate of (60) megabytes, and Norway topped the global list with a flow of (65.4) megabytes, followed by Canada (64.4) megabytes and then South Korea (63.8) megabytes.

C- The Safe Services for Business index represents the level of family protection for information and data within the network per million people that helps companies to establish business safely, and the percentage of this indicator in Iraq is estimated at about (0.7%), which is a weak percentage that loses confidence in the establishment of companies and business institutions in Iraq, while America, Singapore, Britain and Finland occupy the first positions in terms of business security services and data protection, and these results are in line with the Global Cybersecurity Index issued by the International Telecommunication Union in 2021 (United Nations Program United Development Community, 2022: 38)

D- The index of the percentage of businesses that have a web presence, calculated by dividing the number of businesses that have a presence on the web by the total number of business establishments multiplied by a percent, and Iraq has an average of (44%) in 2022 compared to Morocco (89%), Sweden (97%) and Brazil (96%) (UNDP, 2022: 21).

When calculating the average business index using the average of the aforementioned sub-indicators in Iraq, it is clear that it has reached a low percentage estimated at (25.46%), which reflects the size of the gap between Iraq and the rest of the countries in relation to the business index

3**- E-government index** using the World Wide Web in linking its institutions to each other and the optimal employment of human and financial resources and ICT infrastructure in order to improve the services provided to citizens, the business sector and society (Badran, 2007: 8) This indicator measures the average government use of information technology through the following sub-indicators:

A- The index of automated systems for business to the total total systems shows that Iraq has a high rate of (67%), which indicates that (30%) of the government systems in Iraq are not based on this indicator, thus approaching the UAE (73%), Denmark (83%) and Korea (81%) (Al-Khaimi, 2019: 22)

B- Electronic services provided to citizens by the government, which are low in Iraq, as they amounted to (42%) compared to Bahrain, which came at the top of the Arab group by (94%), the UAE (88%), Saudi Arabia (77%) and the Sultanate of Oman (73%), while at the global level, Denmark recorded (99%), Korea (97%), Australia and Finland (95%) respectively.

C- The electronic signature index used in official transactions between government agencies, where its value in Iraq reached (0.19%), meaning that more than (80%) of Iraqi government institutions do not deal with electronic signatures in their official records and transactions (Ministry of Planning, 2021: 44), while the UAE and Bahrain recorded high rates in dealing with electronic signatures amounting to (100%) and the Sultanate of Oman (0.75%), and globally, Denmark, Australia, Estonia, Finland and Korea recorded a percentage of (100%). When calculating the e-government index using the average of the three sub-indicators mentioned above, it is clear that the UAE has occupied the forefront position in the Arab world in the maturity index of e-government services, and the position (21) globally, followed by Bahrain and to constitute the position (38) globally, while at the global level, Denmark achieved first place, followed by Korea, Estonia in third place and Finland, while the percentage of Iraq reached (36%), which is modest to reach (143) globally, which is a low index compared to the countries of the world in light of the sub-indicators.

In light of the above, it is clear that the behavior of the technological spread of the labor market in Iraq as an average, which reached about (30.9%) as a result of the clear decline in its sub-indicators, which are the outcome of

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the average of the three main indicators (human capital (31%), business index (25.5%), e-government index (36%)), which indicates that the digital labor markets in Iraq more than half of them are not covered by the technological diffusion index and are characterized by weak production capacity and low job opportunities, and that the ICT sector in Iraq still loves and cannot absorb the increasing numbers entering the labor market annually, as well as the disparity in income distribution, which is reflected in the high unemployment rates, especially among unskilled workers, which reached in 2021 by (16.5%), which indicates that (1/5) of the labor force is located outside the production system and they will face challenges that contribute to the distortion of the labor market system in Iraq.

CONCLUSIONS

1- The digital economy is characterized by working to build the information society by harnessing technology, especially since the balance of the economic institution has become based on its knowledge and information store in order to achieve many development goals.
2- Iraq is still witnessing the absence of techno-economic policies that help access to the digital society and help improve productivity and increase the competitiveness of its economic structures and institutions to allow for the diversification of exports.
3- The low contribution of technological knowledge in the economic and social sectors of the Iraqi economy, which was negatively reflected in the low rates of contribution to the formation of GDP outside crude oil, which depends on advanced technology and is transferred through monopolized investment companies.
4- Iraq is far from entering the stage of technological development compared to the countries of the world in terms of the technological spread in the Iraqi markets, which amounted to (30.9%), which reflects the size of the gap compared to the rest of the countries.
5- There are good educational indicators at the level of quantitative growth in Iraq, but the low quality of education reduces the importance of quantitative achievements and limits the movement of transformation towards the horizons of the digital economy.

RECOMMENDATIONS

1- Monitoring appropriate investment allocations for the ICT sector in order to create a suitable climate for the digital labor market in Iraq, which would provide significant job opportunities for large segments of the population.
2- Linking education outputs to employment policies through the development of education and controlling the quality of specializations so that they are responsive and homogeneous to the requirements of the labor market and providing the economy with skilled manpower that suits the needs of the digital labor market in Iraq.
3-Developing small and medium enterprises and technological business incubators that serve the digital transformation in Iraq by granting exemptions, privileges and loans on concessional terms.
4- Improve national capacities in ICT research and development to achieve sustainable digital labor markets by focusing on post-secondary scientific research.
5- Crystallizing awareness to understand the foundations of the digital revolution and formulating national policies that reflect reality and meet the needs of the Iraqi economy, relying on the available energies and capabilities in order to achieve the consolidation of technology in the long term.

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