



KNOWLEDGE ECONOMY AND THE FUTURE OF HUMAN JOBS

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Article history:		Abstract:
Received:	6th March 2022	The current phase of global economic development is characterized by a gradual increase in the level of thought and the transition to a knowledge-based economy and defined as "production and services are based on knowledge-intensive activities". Innovation, education, knowledge and creativity are the most important feature of the knowledge economy. The lack of transparency, accountability, cronyism, youth unemployment, weak economic sector, political violence, lack of investment in human capital, lack of research and development spending and training of the greatest challenges to the issue of the knowledge economy in the Arab world are significantly reduced, but some Arab countries, particularly the Gulf states, are beginning to take a step towards a knowledge-based economy. The results of this research show that future jobs will change radically and robots will take over most jobs by 2025 and the machines will work more than today.
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In this competitive world, perfect harmony between the company's objectives and individuals has become an absolute necessity. To achieve a bright career based on the foundations of integration and serious interaction between all elements of society in a way that ensures interdependence and cooperation. based on the knowledge economy. Many societies, including those in the Arab world, face significant challenges in their development efforts. One of the most important of these challenges is to invest in the enormous human potential that exists in the Arab states and at all levels. This should be a rational investment that increases the economic and social returns of this investment by investing economic resources efficiently. Especially at a time when we are living in an age of speed and globalization, at a time when the characteristics of economic resources that have been confined to land, capital and labour have begun to change, since this change, despite the shape and image of these resources, must be taken into account with the emergence of new advantages and prospects. For the workforce and capital due to the emergence of globalization and the development of its concepts to reach the knowledge economy.

This development in awareness and concepts has led to a firm conviction about the vitality of the role of individuals in meeting the challenges of development at all levels and increasing their role and effectiveness in economic and social activity, as well as establishing the competitive advantages and competitiveness enjoyed by individuals within society. Hence, it has become clear what the international community and

governments must do in order to remove obstacles that limit the activation and increase of the overall level of participation in the overall development process, which is based on the basis of keeping pace with global developments and meaningful participation in the development process because of its vital role in this area. This is in the belief that the achievement of inclusive reform of societies in various areas of development (Brinkley, 2012: Ornston, 2013)

Concept of Knowledge Economy

It is seen as integrating modern technology into the production process in order to facilitate this issue and exchange services more simply and faster, and is also known as a process of sharing knowledge as an economic activity. (Schwalje, 2011).

The United Nations Development Programme has defined the knowledge economy as having sufficiently disseminated, produced and employed knowledge in all areas of community activity, economic, civil society, politics and private life in order to steadily improve the human situation; This requires building possible human capacity and successfully distributing human capacities to various productive sectors (Tadros, 2015). The incentives of the knowledge economy are globalization and the proliferation of networks, which have led to faster information transmission and universal access (Tapscott, 2014).

Information automatically becomes the most important commodity in society so that scientific knowledge is transformed into digital coordination and information management and information services become one of



the essential elements of the knowledge economy. The "knowledge economy", where it benefits from the use of knowledge and the use of its data to provide distinct products or services, new or renewable, that can be marketed and profitable and generate wealth through it (Ornston, 2012). It transforms the knowledge economy into wealth. By doing so, the knowledge economy provides jobs not only for the knowledgeable, but also for innovators and innovators, and for those with the skills to support their work. That is, the knowledge economy not only generates wealth, but also creates new jobs (Brinkley, 2006).

Pillars of the knowledge economy: The cognitive economy is based on four pillars: (Ornston, 2012).

Innovation (Research and Development): An effective system of business linkages with academic institutions and other organizations that can keep up with the growing knowledge revolution and absorb it and adapt it to local needs.

Education: it is a basic needs for productivity and economic competitiveness. Governments must provide skilled and creative labour or human capital capable of integrating new technologies into work. The need to integrate ICT as well as creative skills into curricula and lifelong learning programmes is growing.

ICT-based infrastructure: which facilitates the dissemination, processing and adaptation of information and knowledge to local needs, to support

economic activity and stimulate projects to produce high value added.

Rational governance: which is based on strong economic foundations that can provide all legal and political frameworks aimed at increasing productivity and growth. These include policies aimed at making ICT more accessible and accessible, reducing tariffs on technology products and increasing the competitiveness of SMEs.

The importance of knowledge economy: The knowledge economy has a set of characteristics, namely:

Knowledge represents the capital of this economy, and it is characterized by the intelluating, undiminished, and not executed.

Knowledge is concerned with globalization, adapting to customer wishes, and focusing on providing services to consumers.

Knowledge is based on the use of a productive workforce.

Communication and information are the key to achieving the effectiveness of knowledge.

Knowledge helps to raise per capita national GDP. Knowledge provides an environment that stimulates talent and creativity.

Traditional economy versus knowledge economy: Table (1) shows the differences between Traditional economy and knowledge economy.

Table (1)
Traditional economy versus knowledge economy

Sources of variation	Traditional economy	knowledge economy
resources	Sources are decreasing continuously	both information and knowledge do not decrease, on the contrary, they can be shared and increased through their application
capital	in the traditional economy capital can be explained only in financial terms or in physical terms	In the knowledge economy , traditional capital, which had only financial or physical characteristics, turns into intangible capital like intellectual capital and the professionalism of the staff.
time and location	In the traditional economy location and time Specific factor	There is no longer a problem of location in the KE economy. Thus, everything is becoming virtual and therefore global if appropriate technology and methods are being used. Also, time is no longer an issue
based	The Traditional economy is based on Mechanisation	The knowledge economy is based on Digitization

This table prepared by the researcher and according to Ricceri, (2008), Tocan (2012) and HADAD (2017).

Characteristics of knowledge economy



There are many characteristics in the knowledge economy and these characteristics become the dominant feature of economic liberalization, the use of the Internet, e-commerce and e-banks, and most importantly in Table (2)

Table (2)
Characteristics of knowledge economy

Source	Characteristics of knowledge economy
Karlsson et al. (2009)	<ul style="list-style-type: none"> • Continuous increase in knowledge investments such as education and knowledge production, • Widening application of knowledge in the development, production, distribution and use of goods and services.
White et al. (2012)	<ul style="list-style-type: none"> • Open Innovation • Education and Knowledge • Management and Creativity
Tapscott (2014)	<ul style="list-style-type: none"> • Knowledge is the basic production factor • Knowledge economy is a digital economy • Virtualization plays an important role in the knowledge economy.

According to White et al.) 2012), there are five structural components of knowledge economics, ICT, innovation, education, knowledge management and creativity.

The challenges of the knowledge economy in the Arab countries

According to Henry Senburu (2011), the characteristic of economic policy in Arab countries is "characterized by a lack of transparency, accountability, political cronyism, unemployment, delayed development and the weakness of the private economic sector." Political violence in Iraq, Syria, Egypt, Libya, Yemen and Algeria is severely detrimental to economic growth. According to Tadros (2015), there are many pillars of the knowledge economy:

Economic, institutional and ict infrastructure: The issue of the economy of Arab countries continues to depend primarily on the industrial sectors, which account for 53%. Value added accounts for 10% of gdp in Arab countries. Compared to 16% in OECD countries and 22% in Latin America and East Asia and the Pacific), the lack of growth in overall value added and employment levels in knowledge-based industries

suggests that Arab human capital investments have not led to meaningful economic creation or diversification in knowledge-based industry. (Bank 2010).

Education and skills : Arab governments also play a greater position as regulators, suppliers and sponsors of education and training schemes in defining industrial financial growth policies than in other areas. Education and growth requires to be modernized to meet the requirements of new sectors that use technology widely. Arab formal education and training organizational environment and governance structures that regulate the provision of government and private education and training must align with market forces to build the abilities required by the knowledge economy . Arab economies structural transformation into a knowledge based industry needs partnerships between current companies and Arab governments (Schwalje , 2011) . Fig 1 showed Research and development expenditure (R & D) of Expenditures as Percentage (GDP) in 2016-2017 Israel has the highest R&D expenditures as percentage of GDP at 4.25 followed by USA at 2.74 % and China at 2.10 % and Arab countries recorded low values in the R&D.

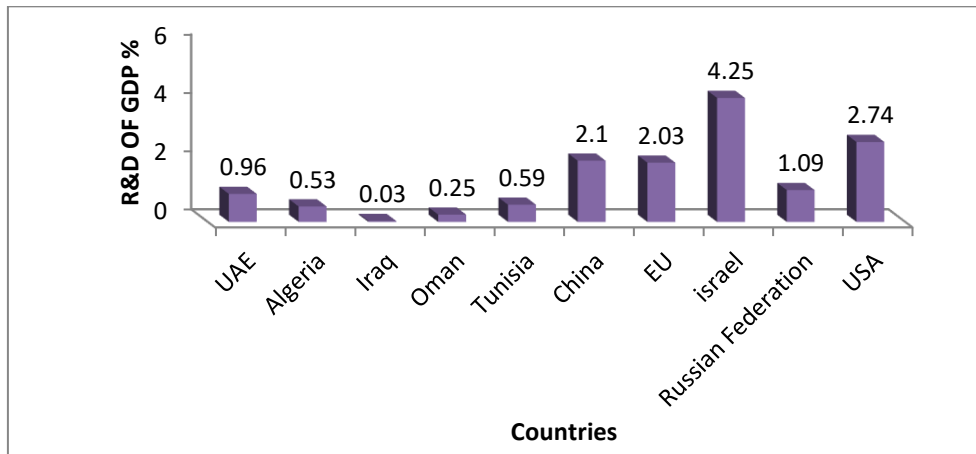


Fig (1) . R & D Expenditures as % of GDP (Source: world bank group, 2019).

Fig . 2 the percentage of employers providing formal training to permanent employees (%) and showed Training experience rates in Arab countries showed lower compared to advanced knowledge economies with advanced systems.

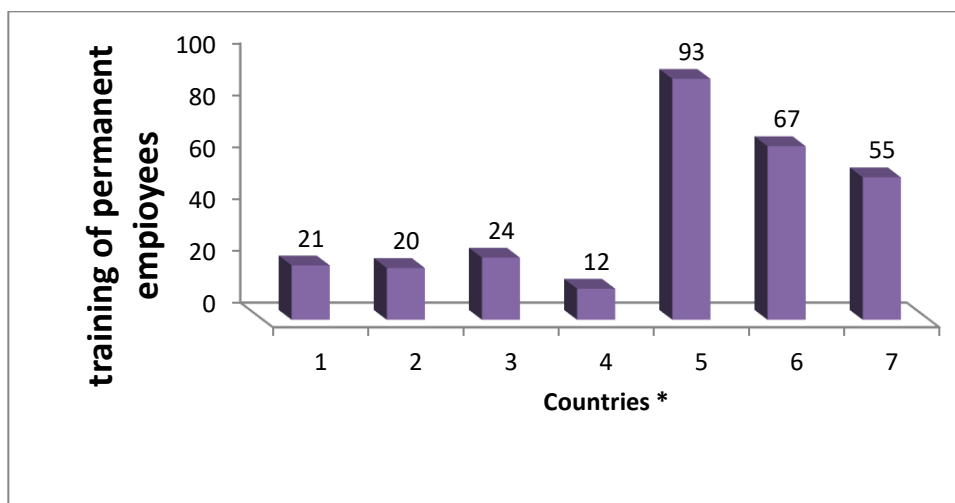


Fig.(2) the percentage of employers providing formal training to permanent employees (%) (Source: Bank , 2010). * 1 Syria , 2 Morocco , 3 Jordan , 4 Egypt , 5 China , 6 Brazil and 7 Russia.

According to Hanouz and Khatib (2010) the training in the Arab countries are lower compare with the knowledge-based and we can except Algeria. It can also be said that 65% of companies have clear and

approved employee training plans, with training focused on highly qualified employees with different skills. (table 3)

**Table (3)
 the training rates in the Arab World and some developing economies (%) (Source: Hanouz and Khatib , 2010)**

countries	skilled	unskilled
Egypt	17	9
Oman	51	43
Morocco	7	4
China	48	25
Ireland	58	57



Arab companies concentrate on training continuous, qualified staff indicates that training presently offered by Arab businesses focuses on constructing firm-specific abilities rather than general abilities.

and I believe that this is a main source of skill gaps in the Arab countries, so the challenge for Arab governments is to build overall capabilities to eliminate skill gaps among less qualified workers with strong work training.

Innovation system:

Innovation and creative thinking can be said to be an important necessity in interconnected business and economic businesses where researchers and entrepreneurs collaborate to encourage business experiences with distinct concepts and techniques. Tin. 3 Global Innovation Index (GII) the top 10 economies in GII 2014 were Switzerland, UK, Sweden, Finland, Netherlands, USA, Singapore, Denmark, Luxembourg and China, the top 50 countries were 36, Saudi Arabia 38 and Qatar 47, respectively.

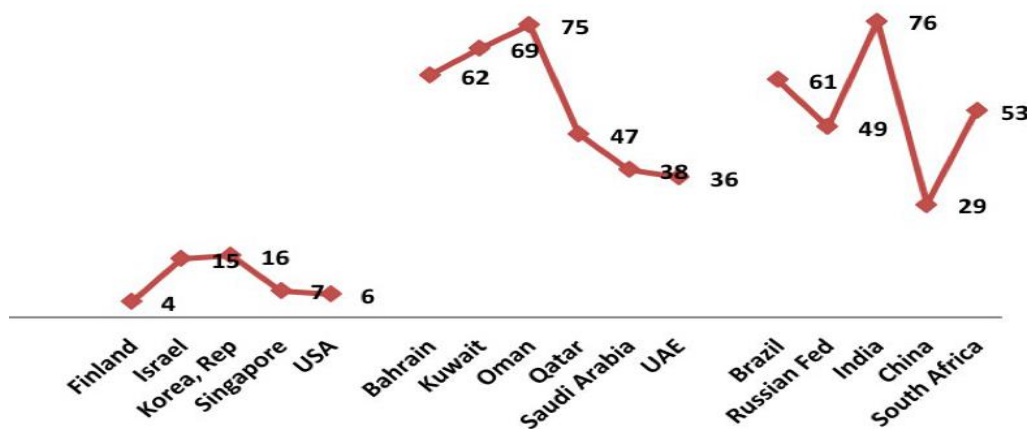


Fig. (3) The Global Innovation Index (GII) in 2014 (Source: Dutta et al. , 2014).

Knowledge economy challenges (in the Arab world the education industry is reforming and ensuring that education outputs meet the abilities and abilities needed by the market as well as the education system should focus on knowledge production) employees and promote research and growth and innovation, and the Arab Gulf States are embarking on knowledge-based economic development.

Future of Human Jobs

The world's workforce exceeds more than three billion employees and workers in many sectors and countries, and no more than 10 or even five years ago

the most required occupations or disciplines, and the pace of change is set to accelerate. According to one estimate, 65% of children entering the main school today will end up working in entirely new types of jobs that do not yet exist. Figure 4 shows a comparison between declining employment and progress in employment in job families 2015-2020 such as computer, mathematics, architecture and engineering, and other jobs are mostly on the rise, and management, sports and the media are declining more in employment families. (World Economic Forum, 2016).

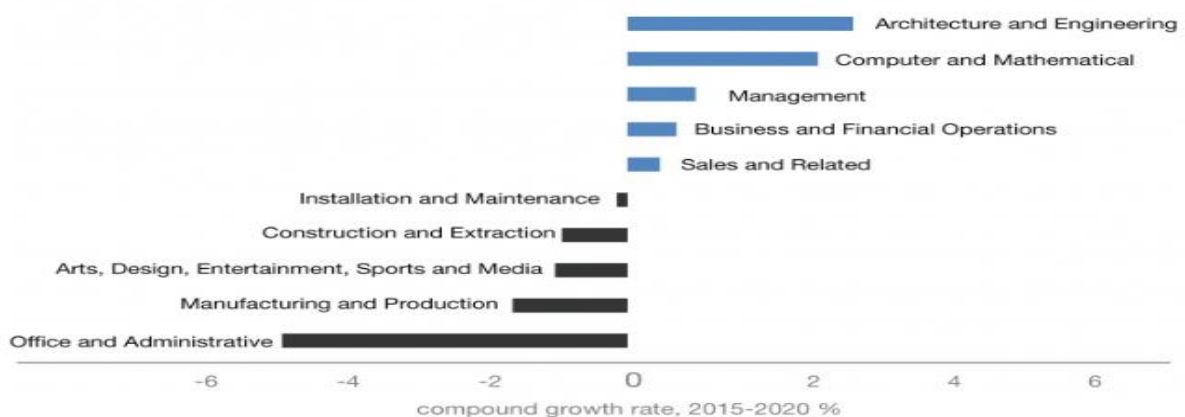


Fig. (4) job families in decline and on the rise during 2015-2020 (Source : WEF , 2016)

Current developments lead to the loss of 7.1 million jobs. According to the World Economic Forum (2016). The ability to perform most jobs in 2022 will also change dramatically. The global average of the main capacity required to perform a job as expected remains at about 58%. This means that employees will experience an average 42% change in workplace capacity in the run-up to 2022. (Increasingly prominent skills include analytical thinking and active learning in addition to capabilities such as technology design, highlighting the growing demand for different types of skills techniques.

The latest World Economic Forum study predicts that machines will perform more current functional duties than humans by 2025, compared to 71 percent of those done by humans today, and that fast-evolving workplace machines and algorithms could generate 133 million new jobs instead of the 75 million people who will be displaced by 2022. (WEF, 2018). The division of labor between humans, machines and algorithms changes rapidly in the future, and Figure 5 shows this change. In 2022 and 2025, most of the work will be carried out by machines or algorithms.

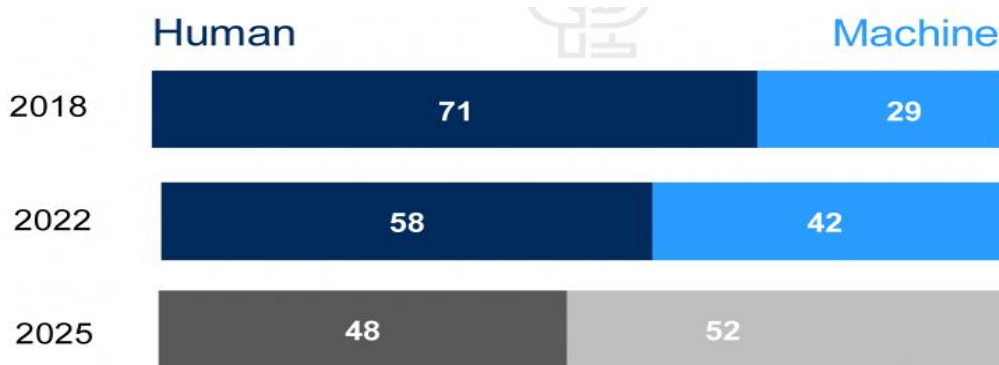


Fig. (5) Rate of Automation (Source : WEF , 2018a).

By 2022, 62% of data processing, information search and transmission functions will be performed by computers, and even today's dominant human tasks such as communication, interaction, coordination, management and advice will begin to implement computers. (World Economic Forum, 2018a). In 2016, the worldwide average density of robots was 74 industrial robots per 10,000 employees, compared to 66 in 2015 and the average density of robots was 99

in Europe, 84 in America and 63 in Asia. South Korea, Singapore, Germany, Japan, Sweden, Denmark, usa, Italy, Belgium, and Taiwan were among the top ten countries in 2016, and Japan was the only country among the top ten to experience an annual decline in robot density. Figure 6 shows the top 10 countries of the IFR report.

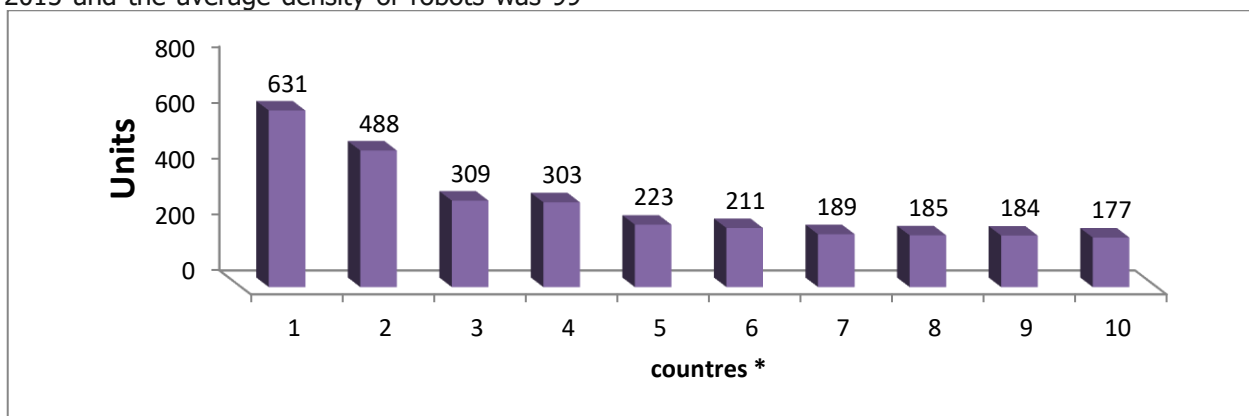


Fig. (6) number of robots per 10.000 employees (Source: IFR , 2016). 1 South Korea, 2 Singapore, 3 Germany, 4 Japan, 5 Sweden, 6 Denmark, 7 USA, 9 Italy, 8 Belgium and 10 Taiwan .



CONCLUSION

Knowledge economics is a quickly evolving economic sub discipline that has never before been provided, and its development depends on the amount, quality and accessibility of the accessible data, rather than on the means of manufacturing.

Innovation , Education , Knowledge and Creativity is the most important characteristic of the knowledge economy .

The lack of pillars of knowledge economy is biggest challenges facing the Arab countries to integrate into this economy .

the jobs of the future will radically change and the robots will take most jobs in future.

RECOMMENDATIONS

Reforming the education industry and ensuring that educational outputs meet market-related abilities and competences and providing an atmosphere for researchers, businessmen and innovators to expand their demonstrated study output and creative concepts to incorporate into the knowledge economy.

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