International Journal of Management Research and Economics
Volume. 3 Nomor. 1 Tahun 2025
e-ISSN : 2986-7398, p-ISSN : 2987-6311, Page 383-388
DOI: https://doi.org/10.54066/ijmre-itb.v3i1.2900
Available Online at: https://jurnal.itbsemarang.ac.id/index.php/Ijmre

Analysis of the Role of the Knowledge Economy in the Context of Iraq's Fragile State Indicators

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Abstract. *Continuing developments in the human world have become mobilized towards a knowledge economy So the knowledge economy has become the key to the development of societies and civilizations, the research aims to highlight selected indicators of Iraq's knowledge economy and link them to fragile state indicators s knowledge economy ", in an attempt to identify the most important challenges facing the growing knowledge economy in Iraq, The problem with research is that Iraq is experiencing a significant weakness in the knowledge economy, which has helped to exacerbate this problem is the fragility of the State. The research assumes that the decline in knowledge economics stems from the surrounding environment. If it is fragile, knowledge economics will not stabilize. The research found the validity of its hypothesis, as the indicators of the knowledge economy were weak under the sovereignty of the fragile State. The research recommended addressing the State's fragile greetings through respect for the law and the development of communications infrastructure and information technology data throughout Iraq's governorates.*

Keywords: *fragile state indicators, ICT indicators, knowledge economy.*

1. INTRODUCTION

Monitoring the behavior of knowledge economy variables and identifying the most important challenges facing it, in an attempt to evaluate the knowledge system in Iraq, towards developing correct answers supported by scientific evidence towards the characteristics of the knowledge economy and the role it can play in improving the local economic environment.

The research assumes that the decline in the data of the knowledge economy stems from the surrounding environment. If it is fragile, the knowledge economy will not be stable.

The research aims to shed light on selected indicators of the knowledge economy in Iraq and link them to indicators of the fragile state, in an attempt to identify the most important challenges facing the growth of the knowledge economy in Iraq.

2. THEORETICAL FRAMEWORK

Knowledge Economy and the Fragile State

The knowledge economy is considered one of the main drivers of growth and progress in modern countries. It represents a qualitative shift from traditional economic models that depend on natural resources such as agriculture and heavy industry. The knowledge economy is based on basic pillars such as innovation, education, human

Received:November 16, 2024;Revised:December 10,2024;Accepted:January 07,2025; Available Online: January 10, 2025

capital development, scientific research, and information and communications technology (Drucker, 1993). This model reflects the importance of the shift towards a knowledge-based economy as a key factor in achieving added value and enhancing productivity. The knowledge economy seeks to invest acquired knowledge and direct it to improve the quality of services and products, which contributes to achieving sustainable development and improving the well-being of societies.

To implement the shift towards a knowledge economy, it becomes necessary to invest in human capital and technology, as this helps enhance the innovative and creative capabilities of individuals. This in turn leads to the creation of a flexible work environment capable of adapting to global changes. Investment in technology and digital infrastructure also enhances the flexibility of the economy and its ability to face the challenges of globalization and rapid economic changes (Romer, 1990). Knowledge here is considered one of the intangible assets that can give countries a sustainable competitive advantage when adopted effectively.

The concept of knowledge economy

The knowledge economy is an economic system that relies primarily on the production and distribution of knowledge as a primary source of economic value. Smith (2003) explained that the knowledge economy is defined as "an economy based on the production and distribution of knowledge as a primary factor for achieving economic value." It includes sectors that rely on research and development, innovation, education, and information technology, all of which contribute to increasing productivity and creating new job opportunities. This economy relies on three main elements: education and training, research and development, and technological infrastructure. These elements play a crucial role in promoting innovation and creativity, enabling countries to make the most of their human resources (Romer, 1990). In the context of fragile states, adopting a knowledge economy is a major challenge, as these countries face a lack of financial resources and weak infrastructure, which hinders the effective development of education and scientific research.

The concept of the fragile state

A fragile state is defined as one that lacks a strong institutional structure and has difficulty delivering basic public services to its citizens efficiently. These states are often vulnerable to economic and social volatility and political conflict (World Bank, 2019). Fragile states are characterized by weak government institutions, widespread corruption, political instability, and poor ability to adapt to economic shocks.

Fragile states often fail to create an environment conducive to the development of new sectors such as the knowledge economy, due to poor governance and the absence of a clear strategic vision (Collier, 2007). Therefore, development in these states requires integrated efforts aimed at building institutions and developing infrastructure to provide a solid foundation on which the knowledge economy can be effectively implemented.

The importance of the knowledge economy in promoting development in fragile states

1. Diversifying the economic base:

The Iraqi economy is almost entirely dependent on oil as a primary source of revenue. This dependence is one of the main reasons for economic fragility, as the Iraqi economy is vulnerable to severe fluctuations in oil prices, leading to financial instability and budget deficits. The Iraqi economy can benefit from developing knowledge sectors such as information technology and higher education to diversify the economic base.

- Developing the information technology sector can contribute to creating new job opportunities, increasing productivity, and promoting start-ups and innovation (OECD, 2012). Information technology also contributes to raising the efficiency of economic performance by improving access to information and facilitating business processes.
- The higher education sector plays an important role in enhancing human capital that supports innovation. Investing in education enables individuals to acquire modern skills that enable them to interact with contemporary labor markets and support their ability to innovate (Lucas, 1988).
- Developing the tourism sector is also part of efforts to diversify the Iraqi economy, as Iraq can benefit from its long history and rich cultural heritage to attract tourists and increase non-oil revenues.

These efforts at economic diversification reduce the negative impact of oil price fluctuations and enhance the stability of the economy in the long run (Auty, 2001).

2. Raising production efficiency:

Production efficiency is a key factor for increasing competitiveness and achieving sustainable development. Technology and innovation can contribute to improving production efficiency in different sectors:

- In the agricultural sector, modern agricultural technology such as smart irrigation systems and remote crop monitoring technologies can be used to increase productivity and improve crop quality (Pingali, C Binswanger, 1988).

- In the industrial sector, automation and robotics can reduce operating costs and increase the accuracy of production processes, leading to the production of high-quality goods at a low cost (Acemoglu C Restrepo, 2018). The application of modern management principles such as total quality management and value chain analysis also contributes to improving performance and reducing waste.
- In the service sector, technologies such as e-commerce and online banking can increase access to services and improve customer experience, leading to improved efficiency and increased revenues (Heppelmann C Porter, 2015).

In short, the knowledge economy offers a solution to the structural and economic challenges facing fragile states, including Iraq, by enhancing economic diversification and raising productive efficiency, which contributes to achieving sustainable development and reducing state fragility.

3. Promoting Transparency and Reducing Corruption

Transparency is an essential element for building strong and effective government institutions, and is considered an effective means of reducing corruption, which is a major obstacle to economic development in fragile countries such as Iraq. Information technology can play a pivotal role in promoting transparency, by providing open government information systems that allow citizens to easily access government information, such as government expenditures and public contract procedures (Heeks, 2002).

Developing electronic platforms for providing government services, such as the online government procurement system, can contribute to reducing corruption by reducing direct interaction between citizens and officials, which reduces opportunities for bribery and favoritism (Bertot et al., 2010). Big Data Analytics techniques can also help uncover abnormal patterns in government spending, enabling authorities to take quick and accurate action.

Improving transparency helps governments build trust with citizens and attracts more foreign investment, as investors view transparency and good governance as essential elements for investing in developing countries (Kaufmann et al., 2009). Therefore, using information technology to improve transparency and reduce corruption is vital to promoting economic stability and growth.

The relationship between the knowledge economy and the fragile state

The relationship between the knowledge economy and the indicators of the fragile state is complex, but the knowledge economy can be an effective tool to reduce the fragility of the state through:

Reducing dependence on oil: Diversifying the economy and supporting knowledge industries reduce the impact of oil price fluctuations on the national economy, which enhances economic stability (Gelb, 1988).

Building effective institutions: The knowledge economy contributes to enhancing the efficiency of government institutions by implementing more effective practices and improving levels of transparency and accountability, which contributes to building a strong and sustainable institutional environment (Rodrik, 2008).

Enhancing community participation: Improving education and information technology contributes to raising the level of community participation, which enhances social empowerment, reduces tensions, and supports political stability.

Integrating the concept of the knowledge economy into development strategies in Iraq is a real opportunity to enhance development and reduce state fragility. Despite major challenges such as poor infrastructure and intellectual migration, focusing on investment in education, developing technological infrastructure, and enhancing transparency are essential steps towards the transition to a knowledge economy.

Public policies should adopt a comprehensive approach that includes enhancing human capabilities, supporting innovation and creativity, and intensifying international cooperation to achieve sustainable economic and social development.

3. RESULTS AND DISCUSSION

Analysis of indicators of the knowledge economy and the fragile state in Iraq

Development of Communications Indicators

It is clear from Table (1) that the number of switchboards in service in all governorates in 2015 was (321) switchboards, and this number began to fluctuate in a low manner until it reached (280) switchboards in 2020 and in 2021 it reached (283) switchboards. The number of main telephone lines (landlines) in 2015 reached (2179.4) thousand lines, and the other began to fluctuate until it reached (2243) thousand lines in 2021. As for the telephone density of landlines, it reached (6.3) per (100) people only until 2021. The number of post offices reached (299) offices in 2015, and the number began to decline until it reached (259) offices in 2021. Perhaps this decrease was due to the weak

interest of individuals in postal activity in general.

The number of postal boxes reached (40,791) boxes in 2018, and the number fluctuated until it reached (43,416) boxes in 2021. The number of mobile phone lines reached (34,958) thousand lines in 2016, and it gradually increased until it reached (40,727) thousand lines in 2021, while the telephone density reached (92.3) per (100) people in 2016, and it continued to grow until it reached (101.4) per (100) people in 2019, and in 2021 it reached (98.8) per (100) people.

Table (1): Communications indicators in Iraq for the period (2015-2021)

2021	2020	201G	2018	2017	2016	2015	indicator	
283	**280**	**280**	**278**	**276**	**264**	**321**	Number of switches	**1**
2243	**2151**	**2126**	**2021.4**	**2062 .4**	**1G84 .4**	**217G. 4**	**Number of main telephone numbers(home phone)**	**2**
6.3	**6.2**	**6.3**	**6.2**	**7.3**	**6.G**	**6.G**	Teledensity per 100 person for landline	**3**
25G	**282**	**287**	**281**	**27G**	**2G5**	**2GG**	Number of post offices	**4**
43416	**45188**	**451G8**	**407G1**	**48386**	**46863**	**50G61**	Number of postal boxes	**5**
40727	**3G282**	**3G671**	**3G151**	**40002**	**34G58**	**33471**	Number of mobile phone lines(in thousands)	**6**
G8.8	**G7.8**	**101.4**	**102.7**	**107. 7**	**G2.3**	**G0.6**	Mobile phone density per 100 people	**7**

Source: Ministry of Planning, General Authority for Statistics and Geographic Information Systems, Transport and Communications Indicators, various years.

Development of Optical Access Service (FTTH) indicators

Table (2) confirms that Baghdad Governorate was the highest in 2023 in all optical access service (FTTH) indicators. In terms of network capacity, it reached (G01G84), i.e. (53.1%), the number of dwellings reached (78840) dwellings, i.e. (68%), and the total number of participants was (164384), i.e. (75.8%). The companies providing the service were the most, namely Al-Jazeera Al-Arabiya Company, Hala Al- Rafidain Company, and Earthlink Company. It was followed by Nineveh Governorate, Salah Al-Din, and the rest of the Iraqi governorates.

Table (2): Indicators of the Optical Fiber Access (FTTH) service according to the governorates in Iraq in 2023

The company equipped for the service	the vacancy	Number of subscribers the total number of subscribers	shops	government departments	housing	network capacity	governorate
Light of the beginning	383,856	1,144	0	0	1,144	385,000	ninava
Thuraya road	28.200	6,040	.	.	.	34,240	karkuk
Alpha and carrier	29,714	5,286	168	55	5,063	35,000	diala
Not in service due to not being referred for investment	43,400	.	.	.	.	43,400	alanbar
Arabian peninsula, aura of two rivers .aberthelink	737,600	164,384	.	.	78,840	901,984	baghdad

company							
Under implementation	96,896	.	.	.	.	96,896	Babil(babylon)
Iraq torrent	2,252	2,748	132	3	2,613	5,000	karbala
Endless experience	4,350	7,150	.	.	.	11,500	vast
Iraq network	106,053	2,935	.	.	2,935	108,988	Salah aldin
civilization	12,026	4,974	1	3	4,970	17,000	najaf
The country if glory	1,892	3,108	0	34	3,074	5,000	qadisia
Kika net	3,408	1,592	54	21	1,517	5,000	Al-muthana
Dream of the future	10,774	13,426	489	1,199	11,738	24,200	Dhi qar
life	8,022	1,978	.	.	1,978	10,000	misan
Alcatel lucent	11,514	1,986	.	.	1,986	13,500	basra
	1,479,957	216,751	844	1,315	115,585	1,696,708	total

Source: Ministry of Planning, Information Technology, Post and Telecommunications Report.

Third: Development of the number of subscribers to mobile phone lines

It is clear from Table (3) that the number of subscribers to mobile phone lines for Zain Iraq, Asia Cell and Korek in Iraq reached (39,150,741) lines in 2018 with a telephone density of (102.7) per (100) people, and in 2021 it reached (40,727,153) lines with a telephone density of (98.8) per (100) people, while in 2023 it reached (40,054,869) lines with a telephone density of (92.5) per (100) people, and the highest subscription was achieved in 2022 and the lowest subscription was achieved in 2018

Table (3): Number of mobile phone subscribers in Iraq for the period (2018-2023)

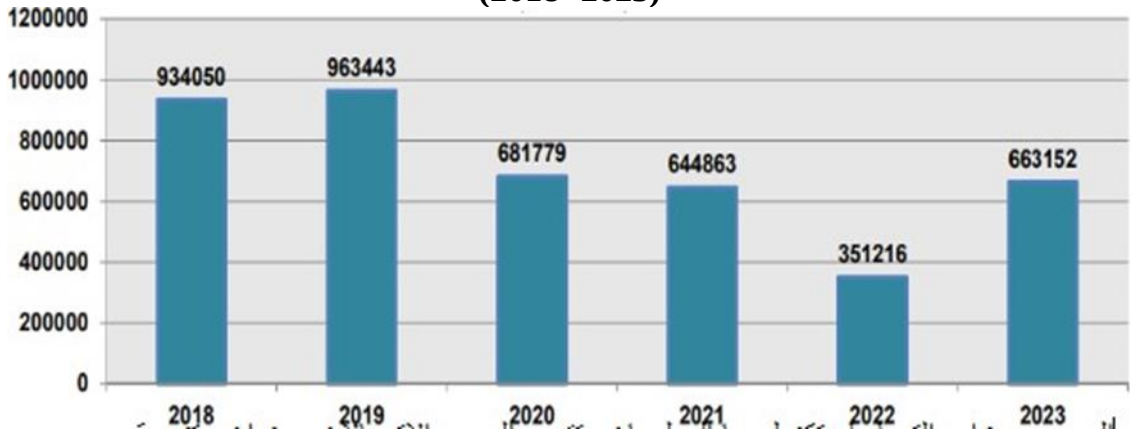
Tele density per 100 people for mobile phone lines	Total number of mobile phone subscribers(zain,korek,asiacell)	year
102.7	**3G,150,741**	**2018**
101,4	**3G,671,125**	**201G**
G7.8	**3G,281,711**	**2020**
G8.8	**40,727,153**	**2021**
104.5	**44,146,G73**	**2022**
G2.5	**40,054,86G**	**2023**

Source: Ministry of Planning, Information Technology, Post and Telecommunications Report, various years.

Development of the indicator of the total number of subscribers to wireless telephone services

From the data in Figure (1), it is clear to us that the highest total number of subscribers to the wireless phone service in Iraq was in 2019, when it reached (963,443) subscribers, and that the lowest subscription was in 2022, with a total number of (351,216) subscribers. It is also clear from the fluctuations in the number of subscribers during the selected period that there is a decline in the attractiveness of this service among individuals.

Figure (1): Total number of subscribers to wireless telephone service in Iraq (2018- 2023)



Source: Ministry of Planning, Information Technology, Post and Telecommunications Report, various years.

Development of the index of mobile internet service participants

Table (4) shows us that the highest number of subscribers to the mobile internet service and beneficiaries of the Zain Iraq, Asia Cell and Korek package was in Baghdad, where it reached (5,305,755) subscribers in 2023, or (22.1%), followed by Nineveh Governorate with a total of (2,172,476) subscribers, or (9%), then Basra Governorate, where the total number of subscribers reached (1,510,787), or (6.2%), and then the rest of the governorates. As for the Kurdistan Region, the percentage of subscribers in Dohuk Governorate reached (4.2%), in Sulaymaniyah Governorate (6.6%), and in Erbil Governorate (7.6%) for the year 2023.

Table (4): Total Number of Mobile Internet Service Participants by Governorates in Iraq for 2023

Total number of subscribers to zain,asiacell,korek mobile Internet service lines	governorate
2,172,476	noninava
1,220,362	karkuk
767,242	diala
1,221,668	anbar
5,305,755	baghdad
1,043,254	Babil(babylon)
992,185	karbala
709,373	vast
944,201	Salah Aldin
1,113,191	Najaf
689,965	alkadisya
415,645	almeteni
937,931	Di Khar
504,910	misan
1,510,787	Basra
	Governorate of Kurdistan
1,013,049	dhok
1,585,625	Soleimani
1,843,011	Arbil
23,990,630	total

Source: Ministry of Planning, Information Technology, Post and Telecommunications Report.

The evolution of the indicator of the number of Internet and wireless phone towers

The accelerated modernization of communication technology is necessary for the sustainability of high-quality telecommunications services, as it is clear from Table (5) that the highest number of second-generation telecommunications towers in 2023 was in Baghdad Governorate by (3893) towers, then Nineveh Governorate by (1618) towers, followed by Basra Governorate by (1334) towers and

Similarly, when the third-generation telecommunications towers were modernized, Baghdad topped with 3923 towers, Nineveh Governorate with 1598 towers, Basra Governorate with 1246 towers and the rest of the provinces. But when the second towers were modernized to become fourth-generation towers, Baghdad province remained by (3022) towers, then Basra governorate advanced by (1132) towers, and Nineveh province declined by (904) towers and the rest of the provinces.

As for the Kurdistan region, Sulaymaniyah Governorate topped the number of towers for all generations, followed by Erbil Governorate and then Dohuk Governorate in 2023.

Table (5): Number of Internet and Wireless Telephone Towers by Governorates in Iraq for the Year 2023

Number of mobile phone towers for the generation **Fourth(4G)**	Number of 3G mobile phone towers	Number of 2G mobile phone towers	governorate
904	1,598	1.618	Ninawa
632	831	832	Kirkuk
535	581	607	Diala
811	989	1,012	Anbar
3,022	3,923	3,893	Baghdad
597	708	732	Babl(Babylon)
743	853	732	Karbala
430	430	505	vast
646	740	755	Salah Aldin
525	660	646	Najaf
285	368	374	alkadisiya
239	274	280	almeteni
486	496	582	Di Khar
336	335	399	misan
1,132	1,246	1,334	Basra
			Governorate of Kurdistan region
248	654	659	Duhok
1,017	1.507	1,519	Suleimania
673	1,444	1,454	Arbil
13,261	17,637	17,933	total

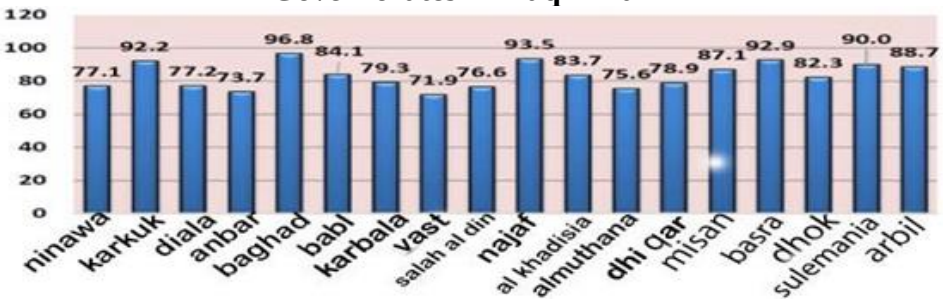
Source: Ministry of Planning, Information Technology, Post and Telecommunications Report.

The evolution of the mobile user index

It is clear from Figure (2) that the highest percentage of mobile phone users for 2023 was in Baghdad Governorate (96.8%), then Najaf Governorate (93.5%), Basra Governorate (92.9%), Kirkuk Governorate (92.2%), Sulaymaniyah Governorate (90%), Erbil Governorate (88.7%).

This indicator indicates the widespread use of mobile phones among the population in all governorates in Iraq in 2023.

Figure (2): Percentage of Individuals Aged (5) and Over Using Mobile Phone by Governorates in Iraq in 2022

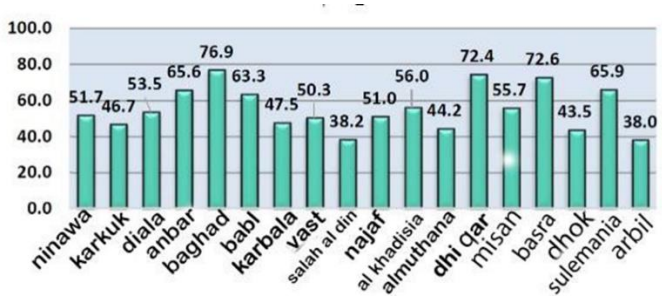


Source: Ministry of Planning, Central Statistical Organization, Survey of Information and Communications Technology Use for Households and Individuals for the year 2022.

The development of the computer user's index

Figure (3) shows that the highest percentage of computer use among the population in 2023 was in Baghdad Governorate (76.9%), followed by Basra Governorate (72.6%), Dhi Qar Governorate (72.4%), Sulaymaniyah Governorate (65.9%), and Anbar Governorate (65.6%). In general, computer use was acceptable in several governorates where the percentage of computer users exceeded (50%), with (12) governorates, compared to a significant decrease in the other part of the governorates where the index values fell below (50%), with (6) governorates.

Figure (3): Percentage of individuals aged (5) and over using computers according to governorates in Iraq in 2022



Source: Ministry of Planning, Central Statistical Organization, Survey of Information and Communications Technology Use for Households and Individuals for the year 2022.

The development of fragile state indicators

Table (6) confirms that Iraq was economically, politically, security-wise and socially fragile throughout the research period, as the index values ranged between (91.4) in 2023 as a minimum at rank (27) globally and (111.4) as a maximum in 2007 at rank (2) globally.

The deterioration of the index values was due to the deterioration of the values of the sub- indicators that make it up, as Iraq suffers from ongoing security threats, a dangerous division between the factions of the political elite, ongoing collective complaints, sustained economic deterioration, injustice and inequality in rights, economic opportunities and local investments, increasing brain drain and youth due to the ambiguity of the economic scene and the weakness of the national will for change, weak state legitimacy, deterioration of public services, loss of human rights, increasing demographic pressures in light of societal divisions, increasing numbers of internally displaced persons due to political and security unrest, lack of job opportunities and increasing foreign interference in the internal affairs of the state.

Accordingly, most indicators of the knowledge economy will remain weak and modest and cannot be developed appropriately as long as Iraq remains a fragile state.

Table (6): Fragile State Indicators in Iraq for the period (2006-2023) (%) (1 low - 10 very high)

years	rank	total	Security enumeration	Elites divided into factions	Protective complaints	Economic decline	economic inequality	Human migration	State legitimacy	For public services	human rights	demographic pressures	Refugees and internally displaced persons	External intervention
2006	4th	109.0	9.8	9.7	9.8	8.2	8.7	9.1	8.5	8.3	9.7	8.9	8.3	10.0
2007	2nd	111.4	10.0	9.8	10.0	8.0	8.5	9.5	9.4	8.5	9.7	9.0	9.0	10.0
2008	5th	110.6	9.9	9.8	9.8	7.8	8.5	9.3	9.4	8.5	9.6	9.0	9.0	10.0

2009	**6th**	**108.6**	**9.7**	**9.6**	**9.7**	**7.6**	**8.6**	**9.1**	**9.0**	**8.4**	**9.3**	**8.7**	**8.9**	**10.0**
2010	**7th**	**107.3**	**9.5**	**9.6**	**9.3**	**7.6**	**8.8**	**9.3**	**9.0**	**8.4**	**9.1**	**8.5**	**8.7**	**9.5**
2011	**9th**	**104.8**	**9.5**	**9.6**	**9.0**	**7.0**	**9.0**	**8.9**	**8.7**	**8.0**	**8.6**	**8.3**	**9.0**	**9.3**
2012	**9th**	**104.3**	**9.9**	**9.6**	**9.7**	**7.7**	**8.7**	**8.6**	**8.4**	**7.8**	**8.3**	**8.0**	**8.5**	**9.0**
2013	**11th**	**103.9**	**10.0**	**9.6**	**10.0**	**7.3**	**8.4**	**8.3**	**8.6**	**7.6**	**8.6**	**8.3**	**8.8**	**8.5**
2014	**13th**	**102.2**	**10.0**	**9.6**	**10.0**	**7.0**	**8.1**	**8.0**	**8.7**	**7.7**	**8.7**	**8.0**	**8.5**	**7.9**
2015	**12th**	**104.4**	**10.0**	**9.6**	**10.0**	**6.9**	**7.8**	**8.1**	**9.2**	**7.5**	**8.9**	**8.2**	**8.9**	**9.4**
2016	**11th**	**104.7**	**10.0**	**9.6**	**9.8**	**6.8**	**7.5**	**7.9**	**9.2**	**7.8**	**8.9**	**8.1**	**9.4**	**9.7**
2017	**10th**	**105.4**	**10.0**	**9.6**	**9.6**	**6.6**	**7.3**	**7.7**	**9.5**	**8.2**	**8.7**	**8.6**	**9.9**	**9.7**
2018	**11th**	**102.2**	**9.0**	**9.6**	**9.3**	**6.3**	**7.0**	**7.4**	**9.2**	**8.3**	**8.4**	**8.7**	**9.6**	**9.4**
2019	**13th**	**99.1**	**8.7**	**9.6**	**8.8**	**5.9**	**6.7**	**7.1**	**8.9**	**8.7**	**8.1**	**8.4**	**9.1**	**9.1**
2020	**17th**	**95.9**	**8.2**	**9.6**	**8.5**	**5.6**	**6.4**	**6.8**	**9.1**	**8.4**	**7.8**	**8.1**	**8.6**	**8.8**
2021	**20th**	**96.2**	**7.9**	**9.6**	**8.2**	**6.9**	**6.1**	**6.5**	**8.8**	**8.9**	**8.1**	**8.4**	**8.3**	**8.5**
2022	**23rd**	**93.8**	**7.8**	**9.6**	**7.9**	**6.6**	**5.8**	**6.4**	**8.3**	**8.6**	**8.1**	**8.5**	**8.0**	**8.2**
2023	**27th**	**91.4**	**8.2**	**7.7**	**8.0**	**6.1**	**5.7**	**6.3**	**8.3**	**8.3**	**7.8**	**7.5**	**9.6**	**7.9**

Source: The Fund for Peace, the Fragile States Index.

*- (A value greater than zero means completely fragile)

Possible opportunities for developing a knowledge economy in Iraq

Despite the challenges, there are opportunities that Iraq can exploit to enhance the knowledge economy:

1. Investing in education and training

Education is the cornerstone of building a knowledge economy. Iraq must improve higher education and scientific research, with a focus on technical, engineering and innovative fields that can contribute to building a strong economic base (Schultz, 1961).

2. Benefiting from digital transformation

Digital transformation can contribute to improving government performance, increasing efficiency, and reducing bureaucracy. By adopting modern technologies, public service delivery can be improved and integration between different economic sectors can be enhanced. (World Bank, 2021).

3. International cooperation

Iraq can benefit from international partnerships and development support programs to enhance its capabilities in the fields of education and technology. Cooperation with international institutions can provide the necessary funding and expertise to develop the education and technology infrastructure (OECD, 2019).

4. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The deterioration of the knowledge economy structure and the weakness of knowledge data among the population on the one hand, and among the Iraqi governorates on the other hand, coinciding with the rise in all indicators of the fragile state during the research period, which supports the research hypothesis and supports its economic implications.
2. The fluctuation and slow change of communications indicators, which indicates the weakness of the communications structure in general in Iraq during the research period.
3. The structural imbalance in the optical access service (FTTH) between the governorates of Iraq indicates the absence of a vision and a planned strategy to develop the modern communications infrastructure regularly between the governorates.
4. The concentration of mobile phone services and other electronic services between only three companies (Zain Iraq, Asia Cell and Korek) weakens the local competitive environment in the field of improving the quality of communications services in all Iraqi governorates.
5. The concentration of Internet, mobile phone and computer users in a small number of Iraqi governorates represents a weakness in the structure of the knowledge society and thus the deterioration of the data of the knowledge economy, and its decline in certain areas of the country.
6. The high indicators of the fragile state mean that Iraq suffers from fragility in all components and joints of the state, which was negatively reflected in the data of the knowledge economy, and the weakness of individuals' desire to receive education through electronic platforms that allow everyone free access to information that develops the spirit of creativity among users of mobile phone technologies and computers with their various capabilities.

Recommendations

1. Continuously updating ICT technology and developing its infrastructure based on the quality of services provided to individuals and annual evaluations of those packages implemented in all governorates.
2. Opening the door to competition for many local and international telecommunications companies, which would weaken the cases of monopoly, dominance and collusion existing in the services of telecommunications companies of various types and forms.
3. Achieving the national will to respect the law by all factions, political elites and other components of the population, which would gradually eliminate all aspects of the fragile state in Iraq.

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