

Iraq ICT Situation and its effect on Iraq Rebuilding: Study, Analysis, and Suggestion

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Abstract

Information and Communication Technology (ICT) provides developing nations with an unprecedented opportunity to meet vital development goals, such as poverty reduction, basic healthcare, and education, far more effectively than before. In this paper, a general survey to ICT statistics in Iraq will be studied and an analysis and a comparison between ICT statistics in Iraq, Arabian and Developing countries will be performed. In addition, a statistical result from a USA and European Countries will be performed for comparison purposes. Suggestions will be presented to reach the required level of ICT in Iraq to enable the process of Iraqi rebuilding. These suggestions include the requirements from educational, governmental, and private sector activities.

Key Words: ICT, ICT in education, ICT in Iraq, ICT and ITU.

1. Introduction

Information and Communications Technology Or Technologies (ICTs) have been identified by many international development institutions as a crucial element in developing the worlds' poorest countries, by integrating them into the global economy and by making global markets more accessible. The World Bank has collaborated with the International Finance Corporation to promote access to ICTs, an initiative which it describes as one of its most

successful. In 2006 the United Nations launched an initiative called the Global Alliance for Information and Communication Technologies and Development [1].

The new information technologies are the driving force behind the explosion of information and the fragmentation of knowledge that we witness today. All available information doubles every three years and yet, we are able to use less than ten percent of the available information.

The greatest challenge facing us today is how to organize information into structured knowledge. We must rise above the obsession with the quantity of information and the speed of transmission, and focus on the fact that the key issue for us is our ability to organize the information once it has been amassed, to assimilate it, to find meaning in it and assure its survival.[2]

ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. Importantly, it is also concerned with the way these different uses can work with each other. Some products for example, are personal computers, digital television, email, and robots.

In business, ICT is often categorized into two broad types of product: -

- 1.The traditional computer-based technologies (things can be typically do on a personal computer or using computers at home or at work); and
- 2.The more recent and fast-growing range of digital communication technologies (which allow people and organizations to communicate and share information digitally) [2,3].

ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries.

According to the European Commission, the importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations. Many countries around the world have established organizations for the promotion of ICTs, because it is feared that unless less technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between technological "have" and "have not" areas. Internationally, the United Nations actively promotes ICTs for Development (ICT4D) as a means of bridging the digital divide. [4]

ICTs allow users to participate in a rapidly changing world in which work and other activities are increasingly transformed by access to varied and developing technologies.[2]

2. Some ICT Impacts

2.1 Economic Impact

In the recent decades widespread incorporation of ICTs into many tiers of business, political processes and structuring of the global economy has occurred. ICTs have increased international interconnectedness and sped up the process of globalization. They have been ICTs, in conjunction with globalization and the information revolution, have reshaped the workforce. By increasing the speed of international communication, ICTs have enabled corporations to outsource jobs, both in the manufacturing as well as white collar sectors. While this lowers production costs and, as a result,

the cost of goods, it has also had fundamental and often detrimental impacts on labor conditions.

Despite the international spread of ICTs, the economic impacts have been geographically uneven. They have exacerbated pre-existing disparities between developed countries, which can afford to produce and consume the latest technologies, and developing countries, which cannot. This gap is known as the digital divide.[2]

2.2 Social Impact

ICTs have impacted societies on many levels. They have extended the reach of public administration, leading to a centralization of regional management into urban centers.

They have led to new forms of employment in innovation and production of ICTs and a demand for highly-skilled specialists. However, ICTs have also enabled professionals in certain industries to be replaced by unskilled workers, or even made entirely redundant. Proponents of ICTs portray this as a 're-skilling' of the workforce, while to detractors it is a 'de-skilling' process.

ICTs facilitate the ease of communication, which has many profound effects. In the business world, deals can be made through emails and video conferencing, and mobile phone technology has made it possible for people to check and send messages on the go, allowing us to be connected. Although this has greatly facilitated the business world in general, many negative implications to be considered as well. Simple messages which used

to be delivered face-to-face are now being sent through the cold impersonal means of email. This has effectively reduced socialization within the office, thus contributing to the weakening of bonds within the workplace.

Despite these imbalances in power relations, many social justice movements believe ICTs can be used to promote equality and empower marginalized groups. These groups advocate ICTs as a means of providing accessible and affordable information and as a platform for voices that might otherwise go unheard. [2]

3. Core Lists of ICT Indicators

The core list of ICT1 indicators presented was the outcome of an intensive consultation process by the *Partnership on Measuring ICT for Development* with national statistics offices (NSOs). This included a stocktaking exercise through which metadata on the status of official information society statistics were obtained from NSOs worldwide, as well as a series of regional events on core ICT indicators.[5]

3.1 Core Indicators on ICT Infrastructure and Access

Basic core examples (A1 to A12)

A1 Fixed telephone lines per 100 inhabitants

A2 Mobile cellular subscribers per 100 inhabitants

A3 Computers per 100 inhabitants

A4 Internet subscribers per 100 inhabitants

A10 Percentage of localities with public Internet access centers (PIACs) by number of inhabitants (rural/urban)

Extended core

A11 Radio sets per 100 inhabitants

A12 Television sets per 100 inhabitants

3.2 Core Indicators on Access to, and Use of, ICT by Households and Individuals

Basic core examples (HH1 to HH10)

HH1 Proportion of households with a radio

HH2 Proportion of households with a TV

HH10 Internet activities undertaken by individuals in the last 12 months getting information: (a) about goods or services; (b) related to health or health services; (c) from government organizations / public authorities via websites or email; and (d) other information or general Web browsing

In addition there is a list of Extended core (See [5] for details).

3.3 Core Indicators on Use of ICT by Businesses

Basic core examples (B1 to B8)

B1 Proportion of businesses using computers

B2 Proportion of employees using computers

B8 Proportion of businesses placing orders over the Internet

In addition there is a list of Extended core (See [5] for details).

3.4 Core Indicators on the ICT Sector and Trade in ICT Goods

Basic core

ICT1 Proportion of total business sector workforce involved in the ICT sector

ICT2 Value added in the ICT sector (as a percentage of total business sector value added)

ICT3 ICT goods imports as a percentage of total imports

ICT4 ICT goods exports as a percentage of total exports

Table (1) shows some statistical indicators to compute the ICT Development Indicator IDI for some world countries including some Arabic and Developing countries. Unfortunately Iraq not included in these international statistics.

Table (1) Statistical tables of indicators used to compute the IDI [6]

	Fixed Telephone lines per 100 inhab	Mobile cellular subscriptions per 100 inhab	International Internet B W per Internet user(bit/s)	Proportion of Households with computer	Proportion of Households with Interne
Country	2002 2007	2002 2007	2002 2007	2002 2007	2002 2007
Bahrain	25.2 25.9	55.9 148.3	1'588 7'660	35.0 50.7	19.0 34.1
Egypt	11.1 14.9	6.4 3 9.83	39 1'023	3.0 16.1	1.4 9.1
Jordan	12.8 9.9	23.2 80.5	293 831	16.4 25.1	5.0 10.5
Syria	11.9 17.3	2.2 31.3	44 304	20.0 35.0	20.0 30.0
Kuwait	19.8 18.6	50.3 97.3	308 2'577	29.0 34.1	24.0 29.1

China	16.6 27.5	16.0 41.2	159 1'735	10.2 39.1	5.0 16.4
U A E	29.1 31.6	64.6 176.5	1'067 5'380	33.0 43.3	30.0 40.4
U K	58.8 55.4	83.3 118.5	9'662 55'281	57.9 75.0	50.0 67.0
U S A	65.3 53.4	48.9 83.5	2'208 15'341	59.0 70.2	52.0 61.7
Sweden	62.5 60.4	89.0 113.7	14'96 62'48	75.0 83.0	66.0 79.0

1. ICT IN EDUCATION

ICT has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy.

One of UNESCO's overriding aims is to ensure that all countries, both developed and developing, have access to the best educational facilities necessary to prepare young people to play full roles in modern society and to contribute to a knowledge nation. Maintaining a capacity to advise national governments on the use of technology in schools and, in particular, on the optimal balance, given local circumstances, between ICT and older educational technologies and assisting countries in developing educational software and materials that reflect their own national and regional cultures are key components of the Organization's strategy to achieve the *Education for All* goals.

The goal has two key purposes. The first is to specify a curriculum in ICT for secondary schools that is in line with current international trends. The second purpose is to outline a program of professional development for teachers necessary to implement the

specified ICT curriculum successfully [7].

The main purpose of ICT in Education means is implementing of ICT Equipments and Tools in Teaching-Learning process as a media and methodology. The purpose of ICT in education is generally to familiarize students with the use and workings of computers, and related social and ethical issues.

ICT has also enabled learning through multiple intelligence as ICT has introduced learning through simulation games; this enables active learning through all senses

ICT in education can be broadly categorized in the following ways as

- ICT as a subject (i.e., computer studies)
- ICT as a tool to support traditional subjects (i.e., computer-based learning, presentation, research)
- ICT as an administrative tool (i.e., education management information systems/EMIS).

As an example In **Kenya**, ICT is not taught as a subject in primary school. It is taught as an added advantage to some schools. In high school, the ICT is an optional subject.

In the **United Kingdom**, Information and Communication Technology (ICT) is a subject in education, and a part of the National Curriculum. All students must study Information and Communication Technology to GCSE level.

Within Scotland and the North East of England a pilot enterprise in education initiative aims to use ICT as a vehicle to encourage creative thinking within the youth demographic. Tapping into the 'unconstrained' minds of the region's young people, the program simulates the process of taking a new innovative ICT idea through the commercialization process. The competition is sponsored by Microsoft and BT and hopes to expand its reach throughout the UK in 2009/10.[8]

For developing countries ICTs have the potential for increasing access to and improving the relevance and quality of education. It thus represents a potentially equalizing strategy for developing countries.

ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural

populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus [7].

6. Challenges for the Uptake of ICT In Arab States

Table (2) shows some statistical ICT indicators for some Arab countries included Iraq for years up to 2008(That what is available in 2010 publications) [9,10].

6.1 Obstacles Relating to the Environment

Most challenges in ICT adoption and usage lie in the political and regulatory environment. With uneven records in legal and regulatory issues, weak ICT strategies, chronic R&D shortages, excessive reliance on foreign technology, and Ongoing weaknesses in ICT implementation, Arab states are frequently lagging in their readiness for the networked future.

Table (2) Statistical tables of indicators used to compute the IDI

	Main(Fixed) telephone lines per 100 inhab.		Mobile cellular subscriptions per 100 inhab.		International Internet B W (bit/s) per Internet user		Proportion of Households with computer		Proportion of Households with Interne	
Country	2007	2008	2007	2008	2007	2008	2007 2008		2007	2008
Bahrain	26.8	28.4	146.9	185.8	7'660	11'020	87.0	87.0	46.5	48.0
Egypt	14.1	14.6	37.6	50.6	1'262	1'995	10.5	13.1	9.5	12.9
Jordan	9.4	8.5	80.3	86.6	788	2'893	25.1	39.3	10.4	13.2

Syria	16.8	17.1	30.4	33.2	304	589	35.0	38.5	30.0	31.2
Kuwait	18.6	18.5	97.3	99.6	2'577	3'390	34.1	35.2	29.1	29.7
China	27.5	25.5	41.2	47.9	1'735	2'149	29.0	31.8	16.4	18.3
U A E	31.7	33.6	177.2	208.6	8'718	13'333	58.5	74.0	48.7	66.4
U K	55.5	54.2	121.2	126.3	55'259	77'179	75.0	78.0	66.7	71.1
U S A	51.3	49.6	85.2	86.8	15'341	21'403	70.2	72.5	61.7	62.5
Sweden	60.1	57.8	111.1	118.3	62'174	109'928	83.0	87.1	78.5	84.4

The Challenges for the Uptake of ICT In Arab States as;

1. High software piracy rates jeopardize confidence with one of the highest software piracy rates in the world.
2. Regulatory Framework Ignores the Arab Citizen
3. No common plan: foregoing ICT efficiency opportunities
4. Insufficient Funding for ICT Research and Development
5. "Digital Poverty:" mediocre bandwidth and connectivity
6. Poor Interconnectivity of Arab IP Systems.

6.2 Obstacles Relating to Individual Capabilities and Access to Technology

Several of the obstacles faced by individual countries are deeply engrained. Such obstacles include societal rigidity, weaknesses in education, unfair income distribution, and uneven access to technology.

- 1- An Increasing Arab "brain drain"
- 2- Digital Divide Remains
- 3- Obstacles in Business and Governmental Sectors
- 4- Weak Local ICT Capabilities
- 5- Marginal Local Language Content

6.3 Prescriptions

1. Create a Common Arab ICT Strategy Aligned With National Ambitions
2. Proceed Towards Technological Sovereignty
3. Increase the Competitiveness of the Telecommunications Industry
4. Reduce the Digital Divide
5. Stimulate Arabic Content

In the developing world, mobile phones have revolutionized telecommunication and have reached an estimated average 49.5 per cent penetration rate at the end of 2008 – from close to zero only ten years ago. This is not only faster than any other technology in the past, but the mobile phone is also the single most widespread ICT today. The number of Internet users, on the other hand, has grown at a much slower rate, in particular in the developing world, where at the end of 2007 only 13 out of 100 inhabitants used the Internet. Fixed Internet access in developing countries is still limited, and, where available, often slow and/or expensive. High-speed (broadband) connections are rare and mobile broadband, while increasing steeply in high-income countries, is still insignificant in most developing countries. In light of such developments, the question remains as to whether the global digital divide is

widening or narrowing, what the contributing factors are, and what progress has been made by individual countries to close the digital divide.[9]

7. ICT in IRAQ

Despite Iraq's turmoil, successive governments have been able to improve the telecom sector and the information society, as well as involve the private sector through the creation of the regulatory environment which is represented by the Communications and Media Commission, which resulted in a boom in the mobile services (GSM). Work is also underway to restructure the sector and to plan its policies by approving a package of legislation and governmental regulations.

In 2009, the Ministry of Communications, almost completed several strategic projects, through which modern technologies for the NGN systems, optical, microwave, and wireless communication services will be introduced. Added to that is the step taken to establish more international space stations, more Internet services, and more infrastructure projects for electronic applications, notably the e-government project.

There are also measures taken to approve the five-year strategy for the development of the sector which has been laid down in collaboration with ESCWA (Economic and Social Commission for Western Asia).

Currently, consecutive meetings are being held to study the strategy, yet its implementation has not been approved. The Ministry of Communications will be the body responsible for its implementation starting from 2010

instead of 2009 as was decided earlier. [11].

7.1 Iraqi Infrastructure

By The Ministry of Communications is heading towards renewing its outdated fixed phone networks and updating its communication systems infrastructure with the latest technologies. As evident in the following projects:

- There is the seven rings optical network which connects all Iraqi governorates via an optical system (DWDM) with a capacity of STM-64. There are also other projects like the Baghdad eight rings optical network (DWDM) with a capacity of STM-64, the optical links STM-1 project, and other projects that link the Iraqi governorates together and with neighboring countries and with the rest of the world;
- There is the national microwave system with seven tracks, with capacities of 7STM-1+ 1, and 5STM1+1;
- There is a new exchange system (NGN) with 720,000 numbers distributed over 26 exchanges of different capacities, work is also carried out to expand the IP Backbone, and update the aging ground network in-order to operate all modern exchanges, as well as establishing 3-management domains which are divided into three zones northern, central and southern, work is also carried out
- to complete the optical system DWDM access networks to overcome the fiber to cabinet problems;
- There are also the space communications, where there are three satellite stations operating in

service with a total expandable capacity of 74E1S. There is also a plan to create more space stations, one of which is Al-Kadhimiya station to the north of Baghdad which is under construction with an expandable capacity of 24E1S;

- There is also the IP project for the e-government and to link ministries and state institutions;
- Seeking to establish a management center to control all communication projects in Iraq, and the electronic archiving project together with the establishing of the LAN networks for the center of the Ministry;
- The reliance of the Internet company on the above mentioned infrastructure to implement its plan using various technologies as a means of network access, including DSL, WiMAX, and in some assemblies the Wi-Fi technology. [11]

7.2 Initiatives and Projects For ICT Infrastructure and Development of New Service

In 2008, the sum of government allocations for investment projects of the Ministry of Communications reached 378 billion Iraqi dinars according to preliminary estimates for this budget. In 2009, these allocations exceeded 250 billion dinars.

Investments in communications networks reached big sums, whereby approximately 3.75 billion dollars worth of mobile phone licenses were invested in. That was in addition to the revenue share of these companies, which ranges between (15-18 per cent) of the gross revenue, and approximately 80 million dollars worth of fixed wireless phone licenses and a

revenue share ranging between (10-33 per cent) of the gross revenue. This investment encouraged competition in the telecommunications market in Iraq, which resulted in better service at a lower cost. [11]

7.3 ICT Connectivity

Based on a survey carried out by "The Iraqi Mobile Bang", mobile phone users did not face difficulties and they were from both sexes and from all social classes. They were also able to call rural areas which suffer from limited fixed telecommunications networks, the public mobile telephone service covered nearly all of Iraq, and the rate of mobile phones reached 1.56 mobile phone per Iraqi family. The rate of the Internet use by Iraqis amounted to 3 per cent, where 39 per cent of whom use it at home, 34 per cent in internet cafés, and 26 per cent in educational institutions, work and other places [11].

7.4 Internet Infrastructure

The Ministry of Communications signed a partnership contract with a Lebanese firm to supply the devices necessary for the Internet service using (Dial-up, VoIP, WiFi, DSL) technologies. The contract continued until 31/12/2007. The Ministry is planning to provide Internet service using fiber optic cables network. It is also planning to sign contracts for the supply of a band between (50-100) MB / s via satellite, as well as to carry out the management, maintenance and expansion of the broadband in Baghdad in-order to provide interconnection to all ministries and some institutions and universities via the micro technology (PTP) and (PMP). This would serve as

the infrastructure for the e-government project. Added to that is the

expansion of the project during 2008 to cover all the city of Baghdad, using the WiMAX technology, and targeting the year 2012 to cover with this technology all of Iraq in-order to serve all government institutions.

In 2009, the building of the international access portals of the Internet in Iraq was completed and its expansion to include all governorates will be finished by 2011. This would provide the possibility to integrate with a very broadband of up to (10GB / s). At the national level, the Communications and Media Commission granted licenses to provide fixed service WiMAX (802.16d) under the fixed wireless phone licenses in the band of 3.5 GHz whereby it granted every national company a band of $4 * 3.5$ MHz and every local company a band of $3 * 3.5$ MHz in order to provide this service. The Commission looks forward to granting other mobile licenses for this service (802.16e) one of which is the license which will be allocated to meet the requirements of government institutions.[11]

7.5 ICT in Education and Training

The Iraqi Commission for Computer and Informatics prepared a number of projects to improve the ICT status in Iraq. It also established in universities about 110 computer centers and 37 centers for the Internet. The Commission opened an academy for networks to train employees from both the public and private sectors, after which the participant is granted an

international certificate recognized by the (Cisco) company.

Iraqi universities have more than (50) departments in the disciplines of computer engineering, computer sciences, and IT. The number of students in the preparatory studies for these disciplines amounted to about 7,000 students. The number of graduates in these specialties amounted to 8,089 graduates and their ratio to the total number of graduates is about 10.8 per cent (according to the reports of the Central organization for Statistics and IT). The universities benefit from ESCWA project on Iraqi academic networks. Refer to Box 2 for more information. To give a general idea about the number of employees working in the ICT disciplines, the General Company for Telecommunications and Post is given as an example, whereby in 2008 the number of its engineering staff amounted to about 1,150 engineers from both sexes, and the number of its technicians amounted to 7,100 in addition to the various supporting staff from other disciplines [11].

8. Recommendations

The recommendations will be divided to three parts due to the deep gap in ICT requirements and infrastructure, these parts are:

- Recommendations due to would and international situations needs.
- Recommendations due to Arab state situation and needs.
- Recommendations for Iraqi Educational process.

8.1 Recommendations due to would and international situations needs

The World Summit on the Information Society (WSIS) held in Geneva (2003) and Tunis (2005) brought together governments, civil society and the business sector to discuss a broad range of subjects related to ICT for development. In the end, governments agreed on a set of commitments and actions to foster the establishment of an inclusive information society. In particular, ten targets were identified in the Geneva Plan of Action, along with numerous recommendations based on different action lines (Action Lines C1 – C11). The targets, to be achieved by 2015, as they are mentioned in the ninth edition of the World Telecommunication/ICT Development Report is being published at the half-way point between the World Summit on the Information Society (WSIS) in 2005 and the target date for the Millennium Development Goals (MDGs) in 2015 are:

1. To connect villages with ICTs and establish community access points
2. To connect universities, colleges, secondary schools and primary schools with ICTs
3. To connect scientific and research centers with ICTs
4. To connect public libraries, cultural centers, museums, post offices and archives with ICTs
5. To connect health centers and hospitals with ICTs
6. To connect all local and central government departments and establish websites and e-mail addresses
7. To adapt all primary and secondary school curricula to meet the challenges of the information society,

taking into account national circumstances

8. To ensure that all of the world's population has access to television and radio services
9. To encourage the development of content and put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet
10. To ensure that more than half the world's inhabitants have access to ICTs within their reach [12].

8.2 Recommendations due to Arab state situation and needs

The Capacity-building Workshop on Information Society Measurements, Household and Business Surveys was held in Cairo from 20 to 21 June 2007 under the patronage of the Ministry of Communications and Information Technology (MCIT) in Egypt, the Information Technology Industry Development Agency (ITIDA) and the League of Arab States (LAS). It was organized by the

Economic and Social Commission for Western Asia (ESCWA), the United Nations Conference on Trade and Development (UNCTAD), the Arab Regional Office of the International Telecommunication Union (ITU-ARO) and the Organization for Economic Co-operation and Development (OECD). They recommend the following main points:

1. Provide practical training to National Statistical Offices (NSOs) and statistics units in ICT establishments at the national level in a number of Arab countries. International organizations and

Arab countries advanced in ICT indicators collection can help other countries, particularly in designing questionnaires, sampling, collecting, validating and analyzing data;

2. 2-Follow international definitions, measurements, methodologies and classifications, such as the International Standard Industrial Classification of all Economic Activities (ISIC), when collecting information technology (IT) data in the whole Arab region;
3. Re-enforce cooperation between the ministries of ICT and the NSOs in Arab countries with respect to measuring, collecting and analyzing ICT indicators;
4. Stratify and represent the community through the existing statistical methodologies available in statistical bodies;
5. Raise the awareness of policymakers with regard to the need to emphasize the collection and analysis of ICT indicators in IT-related policies and strategies;
6. Develop ICT gender-related indicators for the Arab region while taking into consideration women equality and the existing differences between women in rural and urban areas;
7. Emphasize the need for NSOs and ICT statistical units to participate in follow-up workshops in order to ensure continuity and effectiveness;
8. Unify the efforts related to the development of statistical systems for the collection and management of indicators, make the ESCWA Statistical Information System (ESIS) available to organizations in member countries for their in-house usage in managing indicators and provide the necessary training for

set-up, administration and efficient use;

- (i) Create a database for existing expertise in ICT indicators in the Arab region to facilitate the exchange of knowledge and accelerate the implementation of work;
- (j) Call upon international donors to help Arab countries finance their own initiatives on collecting and analyzing IT indicators [13].

8.3 Recommendations for Iraqi Education process

1. Completing building the infrastructure of the communication backbones and connect Iraq with the world through high band width (Fiber optics and sea cables).
2. Strengthen the connection with the International and UN organizations and follow up their recommendations including the standardization.
3. Activating the NSOs in Ministry of planning.
4. Connecting the Universities, research centers, colleges, secondary, and primary schools with the ICT.
5. Put the digitizing policies to the primary and secondary schools and equips them with the computers and networks.
6. The digitizing revolution should be started from universities by planning clear policies for digitizing and networking the universities to cover whole Iraq.
7. Unify and integrating the efforts of MHESR and MoE.
8. Training the ICT groups in MHESR and MoE

وضع تكنولوجيا المعلومات والاتصالات ICT العراقية وتأثيرها في إعادة بناء العراق: دراسة وتحليل ومقترحات

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الخلاصة

يزود الـ ICT الدول النامية بفرصة لم يسبق لها مثيل للوصول إلى أهداف النمو الحيوية، مثل تخفيض الفاقة والرعاية الصحية الأساسية والتعليم وبشكل فعال أكثر بكثير من ذي قبل. يقدم البحث دراسة للمسح العام لإحصاءات الـ ICT في العراق ويعرض هذا البحث أيضاً تحليل و مقارنة بين إحصائيات الـ ICT في العراق والدول العربية ودول نامية. بالإضافة إلى ذلك فإن نتائج إحصائية من الولايات المتحدة الأمريكية وبلدان أوروبية متطورة سينجز لأغراض المقارنة. وكذلك يقدم هذا البحث اقتراحات لغرض الوصول إلى المستوى المطلوب للـ ICT في العراق للتمكين في عملية إعادة بناء العراق. تتضمن المقترحات ما مطلوب من القطاع التعليمي وقطاع الدولة و القطاع الخاص.

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