The researcher tries to focus on understanding and analyzing LIBRARIES, INFORMATION TECHNOLOGY and SCIENTIFIC RESEARCH by finding a relationship between INFORMATION TECHNOLOGY and SCIENTIFIC RESEARCH, INFORMATION TECHNOLOGY and LIBRARIES, and between LIBRARIES and SCIENTIFIC RESEARCH and the impact of each one of them on the other through an adequate study of their concepts.

The previous studies

In a study entitled «Trend towards the computer: a contrastive study according to gender and other variables», Ibrahim Shawqi Abdellhameed attempted to determine whether there are differences, according to the variable of gender, in the users' trends towards using the computer. In another study presented by Sami Zahran entitled «Promotion of Development-Oriented ICT Application for E-Learning», the researcher touched on the subject of Electronic-Learning and the impact of INFORMATION TECHNOLOGY on it, the researcher also presented some of the accomplished learning projects like: Project for Creating Virtual University, Projects a Model for a European University, and Projects for Developing E-Learning Environment(2003). The UNESCO's office in Cairo presented in the Western Asia Preparatory Conference for the World Summit on the Information Society (WSIS) in Beirut, 4–6 Feb. 2003, a paper entitled «Implication of Open Course on Developing Countries» which dealt with the subjects of ICT Revolution and Learning Possibilities, and ICT to realization the Potential of ICTs in Education. Dr. Helmi Abu Al-Futooh and Dr. Abdellbaqi Abu Zaid discussed in their study entitled «Communication Technology and its Educational and Social Impacts: a field study in the kingdom of Bahrain» the impact of communication technology on education quality and youths work at the present time and in the future, and the preparedness to confront its impact on competition, social relationships and the future of societies. In another study by Kamal Al-Jabiri which was presented to the Economic and Social Committee of Southern Asia under the title of «Communication and INFORMATION TECHNOLOGY plans and the strategic vision of the communication sector in the republic of Yemen», the researcher discussed the status of communication sector, as an INFORMATION TECHNOLOGY, in the research and the status of the INFORMATION TECHNOLOGY city and the economic projects.

The importance of the study

The importance of this study lies in the lack of the available studies that try to find a correlation between LIBRARIES, SCIENTIFIC RESEARCH, and INFORMATION TECHNOLOGY.

The question of the study

1. What is the relationship between INFORMATION TECHNOLOGY and LIBRARIES?
2. What is the relationship between INFORMATION TECHNOLOGY and SCIENTIFIC RESEARCH?
3. What is the relationship between LIBRARIES, information, data, knowledge, and SCIENTIFIC RESEARCH?

The purpose of the study

1. Analyzing the concepts of LIBRARIES, information, SCIENTIFIC RESEARCH, knowledge, and INFORMATION TECHNOLOGY.
2. Finding a relationship between LIBRARIES, SCIENTIFIC RESEARCH, and INFORMATION TECHNOLOGY.
3. Identifying the role of INFORMATION TECHNOLOGY in LIBRARIES and SCIENTIFIC RESEARCH.

1 http://www.khavam.com/education-technology
2 http://www.khavam.com/education-technology
The research methodology

The researcher used the method of analyzing the concepts, finding the points of correlation between them and the impact of each of these concepts on the other by identifying the points of agreement and disagreement between them.

There are concepts that should be understood and analyzed in order to understand the SCIENTIFIC RESEARCH process. These concepts are related to the apprehension of the nature of data, contemporary information and the distinction between them, in addition to the modern technology that deals with information and its connection with technology in general and the science that comprises and studies all these concepts and data in addition to the concepts related to SCIENTIFIC RESEARCH such as knowledge, research and LIBRARY and demonstrate the relation between them. For if the European Union seeks to change the nature of the conventional public LIBRARY into an institution that is concerned, in addition to its old mission, with the training related to the use of multi-media technology and transforming LIBRARY into a center for spreading information, this means that the nature of information will change and subsequently the methods for obtaining and producing information will also change.

Nowadays, we are witnessing qualitative and quantitative developments in the fields of information, computers, means of communication and the forms and types of information resources. INFORMATION TECHNOLOGY is one of the future's main instruments which will play an important role in influencing the communities in general and LIBRARIES and research community in particular. In order for the workers in LIBRARIES and the field of research to be able to deal with the modern INFORMATION TECHNOLOGY, they should rehabilitate themselves and their institutions so that they become capable of dealing with the advanced and regenerated INFORMATION TECHNOLOGY, and to employ it in the works of LIBRARY and SCIENTIFIC RESEARCH through utilization and/or production.

The explosion of information and the development of the technological capacities of computers and means of communication led to the emergence of the electronic information phenomenon which the world witnesses an obvious increase in its size and a diversity of its forms. Electronic information resources do not only go side by side with the conventional printed information resources but sometimes replace them. For example, abandoning card catalogues and other traditional forms and substituting them with the online public access catalogue. Nowadays, we can find a large number of LIBRARIES in the world which completely abandoned using and developing card, printed or other types of conventional catalogues and use instead the electronic catalogues. This affects the nature of SCIENTIFIC RESEARCH production process, for research production process requires information. When talking about the transition from the conventional information resources into the technological ones, we should take into consideration the factor of bibliographical control over information. This factor includes many functions like efficiently accessing the information resources, which in turn includes accessing the information represented in statistical, bibliographical, extracted or complete texts forms, and establishing clear characteristics for the bibliographical description process (standardization of the bibliographical description process).

What is meant here is agreeing on a standardized bibliographical description data that include the two forms of cataloguing, the descriptive^ and the subjective^, as well as comprehensively enumerating and recording all published bibliographical materials. The rapid emergence and development of INFORMATION TECHNOLOGY, in addition to other factors such as information explosion, the rise in information resources prices and reducing budgets led to turning away from building up LIBRARY items to just making them available. This means that INFORMATION TECHNOLOGY gives the chance to obtain the information without possessing the LIBRARY item itself. This was due to the diversity of the methods and the forms of storing information, particularly the diversity of the electronic resources, the distribution of information resources round the world, the decrease of communication costs, the urgent need for information when it is needed (up-to-date information), in addition to the computers and communications overlap which led to the appearance of different kinds of information and communication networks especially the internet, the virtual, digital, and electronic LIBRARIES, in addition to the electronic book …etc.

During the last two decades there have been a variation and an increase in the types, forms and methods of producing, processing, organizing, retrieving, and searching for information as fast as possible and with the minimal effort. The last decade has witnessed a widespread development in the following fields. First, computers, especially the personal ones as an INFORMATION TECHNOLOGY, therefore their capacities of storing, printing, technical processing, searching in information and retrieving it have been doubled many times.

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^ what is meant here with the descriptive cataloguing is describing the material composition of information resources through collecting and recording all the information existing on the title page in a standardized manner.

^ what is meant here with the subjective cataloguing is the process of describing the subject of the information resources and by which resources can be grouped according to similar subjects.
Second, means of communication and networks which made the vast world looks like a small village and this led to the appearance of the World Wide Web (WWW). Third, LIBRARIES and information centers which strongly pushed towards a widespread development in the field of information and its resources, as well as in using INFORMATION TECHNOLOGY, especially computers and means of communication. These developments led to the increase of inventions and discoveries which are manifested in the form of an obvious increase in the human intellectual outcomes and this reflects their impact on the SCIENTIFIC RESEARCH works. The question here is what is the Arab position in benefiting from the electronic and conventional information resources? [13]

People's abilities of using INFORMATION TECHNOLOGY vary, but till now, most people depend on the printed book (printed material) as the main and only source of information, in addition to their ignorance of using INFORMATION TECHNOLOGY especially the technology of computers, which in turn led to the appearance of new generation of illiteracy characterized by a generation that is good in reading and writing but refrain from using computers and other information technologies.

Unfortunately, many Arab researchers suffer from difficulties in dealing with the current INFORMATION TECHNOLOGY in general and the technology of computer in particular, although it has become an essential part of our daily life and a main resource of information in all fields. Computer is designed to execute the most complex operations internally and to facilitate the procedures for the user as possible. This can be widely shown by studying the World Wide Web (WWW) in which obtaining information depends on knowing the subject and typing it in the «Search» field or the «Address» and typing it in the form of «Hyper Text» in the address field.

It is well known that the most important form of INFORMATION TECHNOLOGY is computer, it is the best in executing the operations of processing, storing, saving, utilizing and producing information. Technically, we can consider the computer as a device for executing the operation of searching in information. [10]

When we review the concept of INFORMATION TECHNOLOGY we realize that computer is not just a part of INFORMATION TECHNOLOGY, but the most important part of it.

The fundamentals of LIBRARY work are generally based on obtaining and organizing information resources, and providing services, therefore the main purpose of LIBRARY is providing information services to the beneficiaries and researchers. Information services (LIBRARY services) are based on three fundamental principles which are: providing the staff that is capable of dealing with the technology, i.e. the staff capable of dealing with the advanced and rapidly developed information, in addition to the capability of managing (controlling, planning, organizing …etc) the services provided by the LIBRARY, as well as providing appropriate INFORMATION TECHNOLOGY.

The main purpose of using INFORMATION TECHNOLOGY in LIBRARIES and information centers is facilitating the processes of planning, organizing, and controlling the intellectual production and delivering this production to the researchers, scientists and users in general. This reflects the relation between the SCIENTIFIC RESEARCH and LIBRARIES in one hand and SCIENTIFIC RESEARCH and INFORMATION TECHNOLOGY on the other. Information is the fundamental part of the SCIENTIFIC RESEARCH and represents an essential resource for the economic, political, social and cultural sectors, for some people believe that the elements of production are the materials, power, and information. [3]

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Refer figure (1)

5 Refer figure (1)
6 Refer figure (1)
Some of the methods that transforms raw information (data) into information:
1. Direct observation
2. What other people say.
3. Reading and other methods.

In other words, we can say the data transform into information if they are transmitted through written or oral methods. Therefore if data undergo any form of processing, they will transform into information. Information may also be «Developmental» which are related to the intellectual works, SCIENTIFIC RESEARCH and the production of information. This is where information and SCIENTIFIC RESEARCH get together and consequently INFORMATION TECHNOLOGY and SCIENTIFIC RESEARCH also get together, which means that the researcher obtains the information with the help of INFORMATION TECHNOLOGY. «Educational» information on the other hand is the information that assists in the processes of education and learning. Information may also be «Accomplishment» which includes a review of the resources that were used to accomplish discoveries and inventions. [3]

In the light of what have been discussed we can say that INFORMATION TECHNOLOGY comprises the following (the fundamental components of INFORMATION TECHNOLOGY):

Software: such as operating systems (MS–DOS, LUNIX, UNIX …etc), programming languages (C++, BASIC, PASCAL…etc) and application programs which are divided into: general purpose programs (MS – ACCESS, MS – WORD …etc) and specific field programs (WIN /ISIS, M2L …etc).

Hardware: computers and peripherals.

Networks: WAN (Wide Area Network) and LAN (Local Area Network). [3]

Data are considered to be information in its raw form, since data transform into information if they were transmitted, organized, selected, analyzed or if they underwent any other process, therefore data are considered to be raw information and this clarifies the relationship between data and information.

Knowledge is the acknowledgment of a scientifically tested reality and introduces it properly in the thinking of people. It is also the process of applying information, therefore if information underwent a special processing it transforms into knowledge. It is well known that the types of knowledge are: the sensory, the philosophical, and the experimental scientific knowledge, so if information is recognized via the sense of touch, smell, or hearing it transforms into knowledge, which means that people recognized this information via one of the previously mentioned senses. [1, 10]

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7 Refer figure (1)
8 Refer figure (2)
This kind of knowledge is known as the «Sensory Knowledge» and if people go beyond senses to the level of close examination and analysis, then the information that has been analyzed and examined will transform into "Philosophical Knowledge". And if the information is recognized via senses then over verified and recognized by analyzing, considering and philosophizing it, and then over verified through causing a deliberate change in the existing data, i.e. putting it under experimentation, it transforms into «Experimental Knowledge».

After recognizing information through the sensory, analytical, philosophical and experimental ways they go through standardization, which means information (experimental knowledge) transforms into generalizations or specifications (scientific approach).

After the acknowledgement of information through the sensory, analytical, philosophical and experimental ways transforms into generalizations or specifications (scientific approach), information undergoes an additional processing. This processing lies in the transformation of these generalizations or specifications into theories, laws and then rules. This represents the mechanism in which science evolves. It's noticed here that the process of inserting the generalizations and specifications into a science represents a scientific approach; this means that the scientific approach transforms knowledge into sciences.

So, transforming knowledge with the help of scientific approach into theories, laws, and rules in order to over verify this knowledge changes it into scientific-experimental knowledge. This kind of knowledge includes an experimental knowledge and a science represented in the following formula: Generalizations/specifications transformed when over verified into theories, laws, and then rules. [6]

Accordingly, science is a kind of knowledge field dedicated for executing the processes of applying knowledge in reality. In other words, it can be said that science is a process oriented for knowledge standardization through over verifying it. [4]

It must be emphasized here that most kinds of knowledge are produced and changed into sciences via SCIENTIFIC RESEARCH processes, which are represented in discoveries and inventions through creating new knowledge, or increasing the accuracy of knowledge verification by transforming it into a science through hypotheses (generalizations or specifications), theories and laws. Research therefore is a process of finding new knowledge or representing one of the knowledge shapes which represents the efficiency, productivity, verification, and accuracy.

The connection between SCIENTIFIC RESEARCH, science, knowledge, and LIBRARIES is INFORMATION TECHNOLOGY. Therefore, it is important here to understand that the effect of this technology on SCIENTIFIC RESEARCH processes and LIBRARIES is generally included in its role through collecting, recording, saving, processing, delivering, spreading, and producing information.

INFORMATION TECHNOLOGY, as mentioned earlier, represents the computers, instruments, devices and equipment used to mechanize, automatize and process the processes of searching in information. It has also been said earlier that INFORMATION TECHNOLOGY represents the technical means specified for dealing with information, which includes: collecting, recording, processing, delivering, producing, and spreading information.

In the light of what has been mentioned, we can notice that INFORMATION TECHNOLOGY helps in facilitating some processes like, collecting, recording, processing, delivering, producing, and spreading information. These processes participate in accomplishing the works of SCIENTIFIC RESEARCH, managing and organizing documentation and information centers and LIBRARIES.

The importance of INFORMATION TECHNOLOGY for SCIENTIFIC RESEARCH works lies in the information production processes, since the main ingredients of the processes of information production and duplication are writing, editing, translation, advertising, conferences (exchanging information between people), TV, radio, satellites, micro copies, copying, printing, means of communications, publication and education. Information is the basic part of every decision taken by any director in his field. The decision making process depends on the quality of information related to the stated issue, the validity of information in addition to the current need for information, and here lies the major motivation for why people need to gather, save, and organize information for retrieving it as fast as possible and with the minimal effort. This represents the process of information production for the decision maker. [2, 11]

There are basic foundations for performing the SCIENTIFIC RESEARCH works, the most important of these are: the researcher, laboratory, and information center, LIBRARY, or documentation center and others. This clarifies the role of information in the SCIENTIFIC RESEARCH process and finding discoveries or new inventions. Therefore, we cannot find a good researcher who does not make use of LIBRARY or information centers. The question to be asked here is: what is the Arab role in providing such important elements? [2, 12]
mentioned we can conclude that LIBRARY is based on providing both, informational and educational information, i.e. it contains two systems: the first one represents information resources such as books and other printed texts that seek to help in the processes of education and in finding new knowledge (SCIENTIFIC RESEARCH works). The second system is the LIBRARY's inquiry system which includes catalogues, indexes, guidebooks, bibliographies, intellectual production books, encyclopedias, dictionaries …etc. These resources which provide the user with an access to the information in a specific subject in a brief but comprehensive way differ depending on the kind of the resource used in accessing the information. Subsequently, and through these systems, LIBRARY raise the user or the researcher to the level of the high-quality education by collecting and organizing books, periodicals, audio-visual materials and other information resources, and then educating and teaching the individual in an excellent way and subsequently raising the community to the edge of the scientific technical development. This in turn could be done by the researches and the studies which cover all life aspects and are represented in new discoveries and inventions that improve the material, technical, and human aspects. The development should first include the economy, because when the country is strengthened economically, it becomes politically influential and socially strong and heads towards the advancement and enhancement of the educational level, leading, completely or partially, to the welfare of the individual and community in general. Accordingly, looking at the LIBRARY always as part of a mother institution and considering it as an unproductive institution results from the misunderstanding of the LIBRARY. LIBRARY is considered as the backbone of the SCIENTIFIC RESEARCH process that leads eventually to the advancement of the communities on the economical, social, political, and educational levels. The question to be asked here is: what is the current situation of the Arab LIBRARIES on the educational, informational and cultural aspects?

The role of INFORMATION TECHNOLOGY in the processes of producing and helping with information lies in:
1- Participating, partially or totally, in information production.
   E.g. most corporations produce information with the help of INFORMATION TECHNOLOGY. This production is represented mainly in:
   - Information about income.
   - Information about purchases.
   - Information about expenses.
   - Wages, salaries, and others.
   This information is produced by the institutions with the help of specialized INFORMATION TECHNOLOGY represented in software and hardware.
2- Organizing and facilitating the process of retrieving information resources, such as:
   - Information about rival corporations.
   - General statistics.
   - Laws, regulations and others.
   This information is produced by the institutions with the help of specialized INFORMATION TECHNOLOGY represented in software and hardware.

In this field, INFORMATION TECHNOLOGY helps in preparing and designing the tools which help the researcher in collecting information about the variables that are subject to be studied in the research, like questionnaires, tests, the different types of interviews, as well as helping him in sorting the results extracted by these tools and identifying the statistical and descriptive data.

The factors that have led to information explosion and subsequently seeking to create the information that is capable of satisfying the current requirements of information explosion and SCIENTIFIC RESEARCH are: the growing increase of discoveries and inventions, the overlap of different branches of knowledge, and the emergence of new specializations (the appearance of what is called major and subsidiary major). In this century, people have acquired information that exceeds what they have acquired in the course of their long history.

The importance of using INFORMATION TECHNOLOGY in LIBRARIES, information centers, researches, and studies lies in solving the problem of the tremendous increase in the human intellectual production, and the problem of the new demands on information. The rapid scientific development, the overlap of the scientific majors, and the appearance of new subsidiary majors pushed towards focusing on the information itself rather than its resource, i.e. turning away from possessing books and other resources of information into just providing information, and moving from general information resources into specialized ones. All this led to the change of the nature of information resources and consequently the appearance of specialized LIBRARIES and information centers that are concerned in organizing researches and studies that improve the outcome of specific institutions.

INFORMATION TECHNOLOGY also helps in reducing the difficulties of the manual monotonous works, and improving the productivity of work using a fewer number of employees. It also helps in developing the services provided by the LIBRARY like benefiting from the current services and the automated indexing particularly in the field of scientific periodicals and the unconventional abstracts, as well as benefiting from the services provided by
information banks round the world. With the help of INFORMATION TECHNOLOGY, it has become possible now to retrieve, copy, and spread the information easily, rapidly and accurately throughout the world, to coordinate between LIBRARIES in general and the sections of the LIBRARY in particular, as well as to help in strengthening the cooperation between LIBRARIES and the studies and research centers. INFORMATION TECHNOLOGY plays an important role in reducing the LIBRARY's burdensome tasks by providing an access to the index of the LIBRARY items it contains, and helping in lending and returning the LIBRARY items.

It also helps in the processes of obtaining new LIBRARY items and providing the LIBRARY with them (supplying), controlling and managing the LIBRARY's serials, searching for information through the on-line search in order to obtain the information in the form of statistical or bibliographical data, or in the form of abstracts or even complete texts. In addition to what have been mentioned, INFORMATION TECHNOLOGY reduces the space taken by the traditional LIBRARY items, and protects and secures information resources.

**Results**

- Nowadays, LIBRARIES and SCIENTIFIC RESEARCH works can not be isolated from INFORMATION TECHNOLOGY.
- There is a strong correlation that leads, most of the time, to the homogeneity of the relationship between LIBRARIES and INFORMATION TECHNOLOGY in one hand, and INFORMATION TECHNOLOGY and SCIENTIFIC RESEARCH on the other.

**Recommendations**

- Expanding the use of INFORMATION TECHNOLOGY in LIBRARIES and transforming them from conventional into electronic LIBRARIES that depend highly on INFORMATION TECHNOLOGY.
- Expanding the use of INFORMATION TECHNOLOGY in SCIENTIFIC RESEARCH works and enlightening the researcher with the role and benefit of INFORMATION TECHNOLOGY for such works.

**References**