

ICT feasibilities for doing a better research

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Summary

Today world is influenced by ICT In the different areas. Use of ICT has Increasing assistance to the individuals and governments in the areas of commercial, office and even medical. We know that research and development (R&D) is among the most important principles of scientific development and the need of any society to progress and survival. More acceleration in R&D processes and its execution, cause to the development and prosperity of societies and governments. In this paper, we studied ICT tools available to researchers so they can run various stages of the research process successful, accurate and fast, with the help of these tools.

Key words:

Information and Communication Technology, Digital Library, Research Management, Virtual Social Network.

1. Introduction

Today information and communications have created wonderful and unique effects. These effects are clearly perceptible in an obvious ways in « information and communication industry» to control flow of information and also making better use of it for various purposes. Today scientist's innovations and inventions is the result of these new technologies of collecting, accumulation and dissemination of scientific and technical information. In fact, these devices, exchange information as a raw material such as a valuable product for producing other industrial and scientific products, and are a basis for effective and accurate communication [1]. It is undeniable that, day by day researches and learning is being done by novel communication systems. Therefore, today's world is considered an informational literacy and digital worlds; using communication technology creates an added value that is the result of knowledge, creation and mental researches. This created added value will push geographical boundaries of the country out, in different territories such as economic, political and cultural territory [1].

Research has two environments of internal and external. In internal environment research there are five dimensions compromising economic, political, military, cultural and social dimensions. The external environment has same

dimensions. The proof of this subject shows that the research is a strategic phenomenon [2].

Economic issues such as research credits, building research centers, equipment and human resources are economical aspects in internal environments of research. Effectiveness of research is also considered in national economics and we observe issues like effectiveness of results and the effect of implementing research results on national production. In social dimension researchers, research units, scientific associations, journals and management together with making relation between components, form the internal environment of research. From cultural point, we have components in research such as research priorities, fundamental- applied developing researches, quality of projects approval and so on, and all of these will change due to existing sciences [2]. Information and communications technology is a revolution that influences all these dimensions and it could be an opportunity for us in which we can reduce our research gap with other countries, by using this technology [2].

The Increase demands of the researchers that seek long ways to accomplish knowledge, could be shortening with IT [2]. In this paper our purpose is to discuss how to use high capacity of information technology in different dimensions of research activities.

2. Role of Information Technology in promoting research activities

As mentioned in introduction, information and communications technology can be used effectively in different aspects if a research process from the beginning to the end of it. According to methodology science, every scientific study requires seven steps. These steps are [3]:

1. Issue or subject selection;
2. Explain the issue;
3. Present the hypothesis;
4. set up a plan;
5. Data collection;
6. Information process;
7. Writing research report;

Utilization of information and communications technology has an effective role in conducting a scientific research in each of these steps. In the next section, we discuss the facilities that ICT gives us for conducting a better research, in details. But before that, we briefly mention the benefits of using ICT in the whole process of research.

2-1- Advantages of using ICT in scientific studies [3]

- 1- Universality: by using ICT achieving and referring to more resources will be possible and researchers could have a wide range of information.
- 2- Reducing time: high speed in searching, collecting and analyzing information are advantages of researching based on ICT. In addition to process speed and searching information, this technology prepares tools for depiction, transcription, compare edit and archiving information, which accelerate different stages of research.
- 3- Accuracy: even tiniest points and information don't remain hidden with the help of computer, which helps researchers to be safe from many common human errors and increases the accuracy of the research work.
- 4- Discipline: organized structure and classification and archive features, some tools, planning and time management softwares in organizing the activities, notes and doing various stages of research is effective.
- 5- Motivation strengthening: attractions and various features of computer and Internet can be effective in strengthening researcher's motivation and reducing the researching tiredness.
- 6- Teamwork: communication facilities and the opportunity of using networks in this technology, provides proper conditions for organizational activities, large and group researches.
- 7- Durability: such good conditions that this technology provides for result storage, easy maintenance and low volume of information, increases durability of achievements and research results. Furthermore, this feature makes the bills and notes which are obtained during each research, to be used easily in the next researches.
- 8- Being multimedia: in researches that are done based on information technology, in addition to written information, multimedia information could be used and increase efficiency and attraction of the study.
- 9- Easy publish: with ICT capacities and internet no more researchers wait for publisher or different institutes to publish and use their works and easily and without any cost they can publish every section of their research in world level and with unlimited editions. This feature can strengthen motivation and efforts of students and novices in the field of research and make their studies durable.
- 10- Independency from time and location: various and many resources could be carried easily in every condition in the form of CD or any other memories; so, for

conducting research and collecting information, researcher is less dependent on specific time and location.

11- Impossible works: ICT provides facilities and capabilities for researchers that we can say without this technology, achieving that (although with much effort and time) are almost impossible. Comparative studies, various technical lists, statistical graphs, virtual experiments and basic searches are examples of these facilities.

12- Being Update. Using this technology will makes the research up to date and in accordance with the latest information and scientific findings, since the researcher has access to the latest theories and scientific findings any time.

3. ICT facilities for researchers

3-1- Digital library

Using research software, digital library and websites can be directly and indirectly effective in strengthening the subject selection resources. By using research soft wares and having access to electronic resources that are available on the web, better conditions are provided for making use of written, visual and audio resources.[3]

In a scientific society such as university, library serves as the heart of that society and has the duties like serving and coordination of other parts of that society [4]. Libraries have a significant role in producing researcher's scientific information by providing required information resources [4].

3-2- Electronic publishing and creating digital libraries [4]

With the increase of publications in scientific societies and maintenance problems and lack of space in libraries, electronic resources will help libraries and this caused libraries to have access to a lot of information.

Until a few years ago electronic publishing use computers for facilitating and accelerating paper publication but now with concretizing concepts such as electronic magazine, book and also databases, final electronic products enter the scientific society.

Now information technology moves gradually toward producing the book itself and documents, and creating electronic book and consequently creating electronic library has been possible.

Currently, in libraries basic services such as collecting, data recovery and providing service for users is done with automatic tools.

Some libraries are actually moving toward electronic libraries. These libraries scan resources and change them to electronic resources, doing that will assist them to have digital library and by World Wide Web they provide

public access to the collection of their library resources. Furthermore, services of these libraries is done electronically and without the need for physical presence of clients in a specific time and location named library, these libraries provide remote access to resources for clients and answering users' reference questions is done with email. With the spread of internet and having access to digital library via internet, users gain access to required information resources from everywhere in the world.

3-3- Scientific Databases

A database consists of: a large file of digitized information (bibliographic citations, abstracts and full text documents, index entries, images, statistics and etc.) Related to the subject or specific areas where regularly updated, and are formed from the records with the same format, that for ease and speed of search and retrieval, have been organized and with the help of the "database management system» (DBMS) software is organizing. The content was created by the data producers of databases that usually publish a print version of the contents and rent the content to a database server (e.g.: «EBSCO» or «OCLC»). These servers, provides electronic access to data (after it was converted to machine-readable form), usually on CD-ROM or online and using patented mining software [5]. Databases using formal logic, expert systems, artificial intelligence and natural language are given to the user the possibility of data logical deduction; thus, new technology is to create knowledge bases [6]. With another approach, we can classify databases as follows [6]:

- 1- Bibliographic databases
2. The full-text database. It includes full text - is not just the external characteristics. Full text journal articles, and publications, legislation, technical reports, messages in Internet discussion groups and organizations correspondence are examples of such databases.
3. Image database. This is similar to bibliographic database, with the difference that the information contained therein, describing images.
4. Reference database. The base can include a list of objects displayed in a museum or plants catalog at a specific area. It also can provide specific tip that is not available in other types of bases, such as information about the potter, requiring described by shape, size, color, and is completely potter's history.
5. Numerical and statistical databases. The base consists mainly of numerical data and various statistics such as sales documents or scientific data involves physical properties of materials.
6. Descriptive database. These databases involve concise Notes with a wide range explanation of specific geographic areas, programs offered by the university or college, or the facilities of a company.

7. Manuals Databases and other reference sources. It includes a wide variety of reference books in electronic form such as organizations and persons guide or Dictionaries.

Electronic databases provided for researchers the following benefits [7]:

- Fast, accurate and comprehensive information achievement.
- Maintaining a very large volume of information.
- Ease modifies and edits information and data
- avoiding duplication and inconsistent
- Easy Updating
- Easy to search
- Data sharing
- Notification of updates (News Letter)

3-4- Online Forums

3-4-1- Introduction to Internet Forums [8]

Social media is a group of Internet-based applications based on web 2.0 technologies and provide the possibility to create and exchange the contents were built by users. Social media takes many forms, including magazines, online forums, blogs, wikis and social networks as well. Internet forums are modern version of social bulletin boards and one of the oldest types of social media. This site has been focus on the discussion. Users send messages in the forums, commonly called posts and others will respond to these messages. Researchers are classified forum Members in different ways. In a category based on intervention in discussion levels, Members of these communities are divided into four groups.

- Tourists (tourists have no commitment to debate and engagement in the forum, tourists are actually ordinary visitors of the forum content),
- Minglers (Having strong ties to the forum)
- Devotees (having high involvement in the forum and no strong links to it),
- Insiders (Repeated and often old users, with strong ties to the community and intervene actively in its discussions)

Another researcher divided community members into four categories.

- Initiators (Members, who have started a debate and have a relatively large number of messages in the early of the conversation thread)
- Active Members (Initiators that over time continue to send messages to continue)

- Followers (Members who have a small number of messages but participate in the debate)
- Visitors (Members who share little in discussions and don't have a large number of messages)

Some people debate issues prestige is higher than others. These people are known to opinion leaders or sneezing and network agents, they are people who are always on the search for information; creation and dissemination of information at different shape. These people can be found on social networks, blogs and chat rooms. Now that we are familiar with the structure of the Internet forums, the influence that online forums can have on learning and research, will be discussed.

3-4-2- Internet forums impact on learning and researching

Discussion forums were conceptualized as early as 1980. The main objective was to create a platform for asynchronous communication among users. They are seen as online collaborative spaces where diverse set of people converge and share knowledge. Due to this huge repository of knowledge contributed by people from all over the world, online forums can be effective sources of learning. They were also seen as enablers of blended and constructivist learning [9].

Online forum can be used to complement learning and teaching, particularly in blended or hybrid learning courses. According to another work, asynchronous discussion forum can increase students' understanding and give them the opportunity to share information, perspectives and experiences. Besides, it leaves an impact on achievements [10].

Pendry, L. F., & Salvatore, J., in their works [11] considered the mechanisms that may underlie two benefits of online forum involvement: well-being (satisfaction with life) and civic engagement in offline settings. First, we found that the factor that best predicted forum identification was the extent to which people felt the forum had met their expectations about forming new relationships (i.e., the social aspect of forum use rather than the instrumental aspect). Furthermore, consistent with past work, we predicted and found that participants' levels of forum identification predicted their satisfaction with life (but only for users of stigma-related forums). We also found evidence that forum identification predicted participants' involvement in offline civic behaviors (for users of all types of forums). Finally, they predicted and found that identification with other forum users mediated the relationship between expectations about forming relationships being met and users' satisfaction with life.

3-5- Social networks and its impact on research [12]

Today's World features have emerged, with computers and internet communications. One of the ICT features based on web 2.0 is Virtual Social Networks. Social networks have defined as Web-based facilities which allow people to create public and semi-public profiles, create communication lists with other users in detail and view and navigate your contact list and other lists made by other users. Social networks and the online community of Internet users who wish to communicate with other users in their areas of mutual interest, now social networking between users so welcomed which is arguably one of the most influential provided services has created tremendous change in recent years in many countries social system. In the field of science and education, social networks are research area for students comprehensive information that growing rapidly. With the advent of social networks, the use of these networks is an integral part of the lives of many students and has direct effect on all aspects of their life, including the performance of education and other academic skills. Researchers have done a study in 2010 about the use of social networks (Facebook) on students in higher education, by combining social networks tools and services in e-learning system, users on schools and universities can have connections with each other and create a virtual community. Other researchers in their study integrate Coome LMS and Facebook, and they came to the conclusion that e-learning processes are completed with social networking tools. Researchers at the Rhodes University have studies on increasing the educational value related to social networking platform and learning management systems integration conducted that informal learning Level have increased by using social networks in the education system.

In recent research on the use of social software have taken place in higher education, It is clear that the use of social networks, has brought educational purposes such as invent new ways to learn, giving control to students, provide transferable skills, support training to each other, increasing the constructivist learning, digital identity and fostering social interaction. In other study, Data analysis showed that social network sites supports student's social learning in three areas:

- Recognition and appreciation of creative work
- Graduated colleagues supporting
- Class assignments

The researchers stated in their study conclusion that students spend considerable time using electronic media. Results of the study in 2008 showed that students used social networks website, as the primary communication method. A lot of research that explores the motivations of people to join social networks show that these networks have provided the entire user needs that already scattered

by e-mail, news websites, blogs, chat rooms and other meeting. With the continuing rise in popularity of virtual networks, most academics to increase the use of these networks in order to successful teach to students. Social networks are used in many classes of universities. Most professors who have practiced this technology believe that these networks are a way through which they have a positive relationship with the students during their teaching. Furthermore Experts have expressed the social relationship between students through social networks can be a factor for successful learning.

4- Conclusion

ICT has provided many tools for researchers. Researchers with the aid of search engine and scientific Web based search software can be choose their research subject more comfortable. Online Scientific databases and digital library provides researchers access to research findings associated to their topic and also related works. And finally Tools such as online forums and virtual social networks have created a wide variety of facilities for researchers to communicate with each other and be aware of their scientific activities.

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