

USE OF INFORMATION TECHNOLOGY IN RESEARCH

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Abstract

Information technology—the set of computer and telecommunications technologies that makes possible computation, communication, and the storage and retrieval of information—has changed the conduct of scientific, engineering, management, and clinical research. This report examines present trends, future potential, and impediments to the use of information technology in support of research. Written from the viewpoint of the researcher using information technology and including many examples, the report offers a number of recommendations directed to two principal audiences: policymakers and leaders of institutions responsible for the support and management of research, and researchers themselves. Recently, computer technology has been joined with telecommunications technology to create a new entity: information technology, which has done much to remove the constraints of speed, cost, and distance from the researcher. On the whole, information technology has led to improvements in research. Researchers can collaborate more widely and efficiently. Much more data are available for analysis. Analytic capabilities have improved significantly, along with the capability to present results as visual images. New information technologies offer further opportunities to improve research. But widespread use of computers in research has not come about without problems. Some of these difficulties are technological, some financial. Underlying many of them are complex institutional and behavioral constraints.

Keywords: Information Technology, Research.

Introduction

This article is about how information technology has changed the conduct of scientific, engineering, management, and clinical research. Information technology is that set of computer and telecommunications technologies that makes possible computation, communication, and the storage and retrieval of information. The term, therefore, includes

- Computer hardware of all kinds, from microprocessors dedicated to specific research tasks to the largest supercomputers;
- Communications networks that link researchers to each other and to resources of various kinds; and
- Computer software that researchers use to design and run scientific projects, and to manage the information that the projects yield.

New technologies offer new opportunities, although pervasive use of computers in research has not come about without problems. Some of these problems are technological, some financial. Researchers used computers to do arithmetic calculations previously done with paper and pencil, slide rules, abacuses, or roomfuls of people running mechanical calculators. Benefits offered by the earliest computers were more quantitative than qualitative; bigger computations could be done faster, with greater reliability, and perhaps more cheaply.

At present, personal computers selling for a few thousand dollars can put significant computing power on the desk of every researcher. Meanwhile, advances in the software through which people interact with and instruct computers have made computers potentially accessible to people with no specific training in computation. More recently, computer technology has joined telecommunications technology to create a new entity “information technology.” Information technology has done much to remove from the researcher the constraints of speed, cost, and distance. On the whole, information technology has led to improvements in research. New avenues for research have opened. The amount of data that can be analyzed has expanded, as has the complexity of analyses. And researchers can collaborate more widely and efficiently. Different research disciplines use information technology differently. Uses vary according to the phenomena the discipline studies and the rate at which the discipline obtains information.

For these disciplines, computers that can handle large amounts of information quickly are essential and have made possible research that was previously impractical. Other disciplines, such as economics, psychology, or public health, gather data on events that accumulate slowly over relatively long periods of time. These disciplines also need computers with large capacities, but do not need the capability to react in “real time.” Most disciplines use information technology in ways that fall somewhere in the range between these two extreme

Objective of study

- To grasp the concept of IT in research.
- To study and understand the nature and need of IT in research.
- To assess the advantages uses and challenges in implementations of IT in research.

Research Methodology

An explanatory research is study based on secondary data collected from various e-journals, articles, newspapers, and reports with focus on different concept of IT use in research.

Important IT Tools in Research

1. REF-N-WRITE Academic Writing Tool

REF-N-WRITE is a fantastic research tool for beginner writers and non-native English speakers. This is a Microsoft Word add-in. This tool allows users to import research papers into MS Word. Then the tool allows us to search the research documents while we are writing our research paper or academic essay. This tool is similar to GOOGLE search engine.

1. REF-N-WRITE Academic Writing Tool



2. Free Online Statistical Testing Tools

One of the most important requirements for our research is the use of appropriate statistical methods and analysis to backup our claims. Whether we are doing quantitative or qualitative research, statistical analysis will be an indispensable part of our workflow. This tool allows us to cut and copy our data directly from our spreadsheet and perform the required statistical analysis.

2. Free Online Statistical Testing Tools



3. Microsoft Excel

One of the widely used tools for research is Microsoft Excel. MS Excel has plenty of features that will come in handy when we are doing a research project. Excel is a must-have research tool if our study involves a lot of quantitative data. Excel offers a wide range of statistical functions that we can apply to the cells in a few clicks. We can visualize our data using a wide variety of chart types. We can use pivot tables to organize and generate summaries of our data easily.

3. Microsoft Excel



4. Google Scholar

Google Scholar is a free online research tool offered by Google. This tool allows users to search for academic literature, scientific articles, journals, whitepapers, and patents across the web. This is an excellent tool for research. Google Scholar displays vital information about the article, such as citation numbers, version, and other articles citing the current article. It also alerts us if somebody else has cited our papers.

4. Google Scholar



5. Research Gate

Research Gate is a social networking site for people doing research. The site contains more than 11 million members that includes scientists, academics, PhD students, and researchers. Users can create an account using a valid institutional email address. Once successful, they can create a profile, upload pictures, list publications, and upload full-text papers. Research Gate is a perfect research tool for researchers and academics looking for collaborations.

5. ResearchGate



6. Plagiarism Checker

Plagiarism is seen as academic misconduct. Plagiarism is not taken lightly by academic and research institutions and is punished and penalized severely. Plagiarism occurs when we copy and paste a large chunk of text from a document return by someone else without giving credit to the author there are plenty of plagiarism detection softwares and online cheking tools available that we can use to check how much of our text overlap with previously published materials.

b. Plagiarism detection software tools



7. Project management tools

This tool can help us minimize the amount of time we spend on managing the project and instead concentrate research work it allow us to layout what is to be done, by whom, and by then it also helpful if we can visualize our task and the timeline in execution using simple diagrams such as Gantt chart.

7. Project management tools



8. MS Word

MS word is a popular word- processing program used primarily for creating documents such as letters , brochures, learning activities, tests, quizzes and students's home assignments. there are many simple but useful features available in Microsoft Word to make it easier for study and work.



9. Microsoft Power Point

Microsoft Power Point is a presentation created using Microsoft Power Point software. The Presentation is a collection of individual slides that contain information on a topic. PowerPoint presentations are commonly used in business meetings and for training and educational purposes.



10.PDF

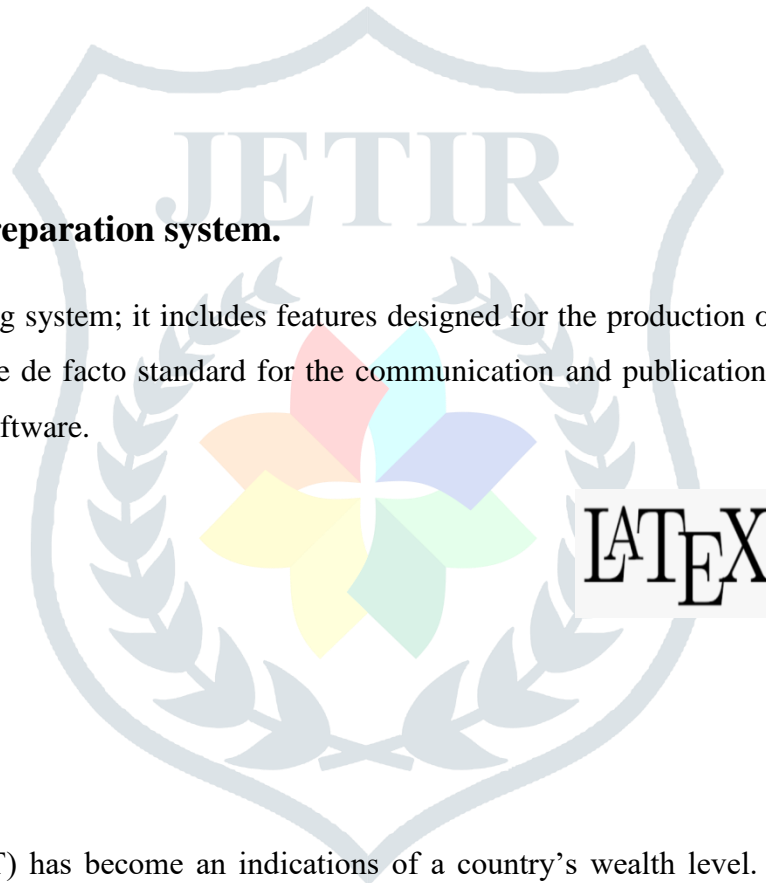
PDF stands for “portable document format “.It was introduced to ease the sharing of documents between computers and across operating system platforms when you need to save files that cannot be modified but still need to be shared and printed.



11. LATEX

LaTeX- A document preparation system.

LaTeX is a highly typesetting system; it includes features designed for the production of technical and scientific documentation. LaTeX is the de facto standard for the communication and publication of scientific documents. LaTeX is available as free software.



Review of literature

Information Technology (IT) has become an indication of a country's wealth level. Countries which fail to prepare for information technology and do not use it properly, are likely to lose their global competitiveness. Muslim countries have paid little attention to leverage the benefits offered by the IT use in their library and information centers. There is so much information that is generated and available in the Muslims world that is hardly indexed, abstracted, or compiled in local databases, Ramazan Mohammad(2004).

The application of information and communication technologies in health information access and dissemination in Uganda. The project focused not only on information obtainable through libraries for research, teaching, learning and practice, but also on ICT applications concerned with the administration and planning of health services in Uganda. A thematic analysis highlighted the current state of ICT applications, the extent of applications, the roles played and problems faced. Further explores areas where it is used most, cost of accessing

information, user profile, ICT literacy, quality of services and telemedicine in the country, Omona and IkojaOdongo (2006).

The training and knowledge are the sine qua non of a positive attitude toward ICT. It is essential for libraries to keep up with ICT developments. The fears of some in the developing world toward ICT is widening the digital divide. In African it is time to bridge the digital gap. African libraries who are not yet automated should begin thinking about it now. Training is the first step, which will reduce fears when implementation of ICT begins, Adekunle, et al (2007).

The accelerated adoption and use of ICT has resulted in the globalization of Information and knowledge resources. ICT is changing the work of libraries and Inf. Centers. An increased number of users, a greater demand for library materials, an increased in the amount of material being published, new electronic formats and sources, and the development of new & cheaper computers are some of the reasons for the growing need for ICT in Bangladesh. The country's libraries have not made equal progress in this areas. The government, must help develop ICT based libraries to meet the changing demands of the users, Islam, Shariful and Islam, Nazmul (2007)

Choosing appropriate ICT hardware and software, continuous pressing for more funds from parent institutions; seeking for alternative sources of funds, staff and user training and raising awareness are the among key strategies that can lead to effective utilization of ICT facilities and services in libraries, Emmanuel, Grace and Sife, Alfred (2008).

IMPLICATIONS & RECOMMENDATIONS

The institutions supporting the nation's researchers must recognize and meet their responsibilities to develop and support policies, services, and standards that help researchers use information technology more widely and productively. Specifically

Universities should provide accessible, expert help in learning and using information technology

Universities departments, and research and professional groups, should establish career ladders for scientific programming positions

Funding agencies should provide support for research programming and for help services in learning and using information technology systems for research

University departments, and scientific and professional groups, should implement mechanisms for the evaluation, merit (peer) review, and dissemination of software useful in the conduct of research.

Software vendors, and scientific and professional groups, should create program libraries and make them accessible through the networks

Information service providers should create simplified common standards for accessing and querying information sources and eventually provide unified access to information

Conclusion

Software's like REF-N-WRITE academic writing tool, Free online statistical testing tools, Microsoft Excel, Google Scholar, Research Gate, Plagiarism Checker and, Project management tools are predominantly used even in research activities, rather than tools distinctively designed for specific research interest. The cause for the same, as highlighted in the survey outcome is that respective researchers are not trained in using them. Moreover, the existing softwares lack proper analysis mechanisms and report generation features. Another major aspect highlighted in our research was the absence of correlation between business intelligence and research activities. In order to increase the usage of IT among researchers it is suggested that software tools should user friendly with data analysis feature present there. There is a huge potential in developing mobile based software applications for research which currently are almost nonexistent. Also positive steps need to be taken by Government and private funding agencies to involve more and more people into the research.

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