USE OF INFORMATION TECHNOLOGY (IT) IN RESEARCH

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Abstract:

Now a days from schooling level to doctorate level study or education, technology has become most integral part of the learning process in and out of the classroom.Research has become so much easier than before with the help of Information Technology in today's era. The main purpose of the Article is to answer the question "How does InformationTechnology can be used in Research education and why it is important in Research". In other words, this Article intends to discover how different techniques and tools are being used during each steps of the Research process. This study helps us to know about the importance of current and accurate information in one's respected field and by what other way's it would be beneficial for their purposes and does technology be allowed as major source of organized information source for education.

Keyword: Information and Technology, use of Technology, Techniques and Tools, Importance of IT, Methods, Advantage and Disadvantage of IT in Research.

Introduction:

Information Technology uses several layers of physical equipment and management or automation toolsandsoftware used to perform essential functions.Information technology (IT) is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data. Typically, IT is used in the context of enterprise operations as opposed to personal or entertainment technologies. The commercial use of IT encompasses both computer technology and telephony. IT has taken an important role in Research.

Research commonly refers to search for knowledge and that Information Technology has led to improvements in research. Research includes a lot of materials which needs to be searched or examined like, collection of data, analysing of data, questionnaire, discussion with colleagues, review of data, literature review, article writing, and Information Technology has had important effect on all these activities. That's the reason IT has made research a loteasier than before.

What is Information Technology?

Before talking about Information Technology, we need to know what Information Technology is. Information Technology is basically the use of computer, laptop or other physical devices, storage, or networking, infrastructure that processes to store, create, process, secure and to exchange all forms of electronic data. Information Technology includes software and hardware, hardware is those which has several layers of physical

equipment. Software are mostly used to perform essential functions. User devices, peripherals and software, such as laptops, smartphones or even recording devices, can be included in the IT domain. Information Technology is considered to be the subset of Information Communication Technology.

What is Research?

Research is detailed and careful study on a particular topic with scientific methods. While research using scientific methods, you try and learn something by performing and experiment. It is the best way to turn a topic into a question and to the eye of people. Research can be about anything, to begin researching something, you have to have a problem, concern, or issue that has turned into a question. These can come from observing the world, prior research, professional literature, or from peers. Research really begins with the right question, because your question must be answerable.

Use of Technology:

Technology made human life way easier but the negative aspect of it can not be ignored. Over years technological advancement has caused a several rise in pollution. Also, pollution has become major cause of health issues. Technology has become the part of everyday life. Technology is being used in many ways:

1. Communication Technologies: it helps to continue being in touch with people who are not staying near with us. Long distance communication is one area where technology has made its place specially n workplaces. With the help of Technology there is no need of fax machine and surface mail.
   Today, there are a lot of modes to communicate in business is available. Such as, email, SMS, and various chats software tools have become principle modes. Also, the video conferencing facility has also reduced to travel physically for any meeting.
2. Office productivity: Word processing, spreadsheets, digital presentations and other office productivity software have become so commonplace that their use has become routine, and this has completely transformed office work. Office software is now becoming integrated with other productivity and decision-making tools like Power BI and this new wave will revolutionise the workplace again.
3. Record keeping and retrieval: Another area where advanced technology is already ubiquitous is record keeping.Most businesses have switched to electronic databases, rather than paper files, to store and access their records, and this has become an essential and everyday part of our work environment.
4. Internet and search: Another major tool that has become so commonplace so as to become nearly unremarkable, is the internet and its organization through search portals such as Google and Bing.

There are a lot more use of technologies then the above-mentioned sectors, which has taken place in today's nation. Though all the useful sectors are not discussed here but can be find everywhere.

Research Methods:

Research methods are specific procedures for collecting and analysing data. Developing research methods are the integral part of research design. When planning your methods, there two key decisions you will make.
First of all, you will have to decide how will you collect data. There are many ways to collect data on a research. A research is based on what type of data you need to answer your research question:

- **Qualitative vs. quantitative research:**

At the time of collecting and analysing data, qualitative research deals with the words and meaning while quantitative research deals with statistic and numbers. Both the methods are important in collecting different types of knowledge.
Qualitative research expressed in words, it is used to understand the concept, meaning and experiences. This type of research enables you get into the depth of the topic that are not well understood. Qualitative method includes interviews, literature reviews, observation described in words that explore concept and theories while in quantitative research it is expressed in graphs and numbers, it is used to confirm or test theories and assumptions. This type of research is used to established generalizable facts about a topic. This method includes experiments, observations recorded as numbers.

- **Primary vs. Secondary:**

Primary data in a research is called the main data of the research. It is originally the data that we collect for the purpose of answering the research question. These types of data are collected through survey, observation and experiments. While secondary data are those which are already been collected by other researchers.
You will need to collect primary data when you are exploring novel research question. While secondary data might be better choice when you analyse the existing knowledge, analyse historical trends or analyse pattern of a large scale.
Primary data can be collected to answer specific question and requires training in data collection method. while secondary data are easier and faster to access and requires extra processing to make sure it works for your analysis.

- **Descriptive vs. Experimental data:**

In descriptive research, you collect data about your study without intervening. The validity of your research will depend on your sampling method. In experimental research, you systematically intervene in a process and measure the outcome. The validity of your research will depend on your experimental design.

Descriptive allows you to explain your research subject without influencing it. It is accessible and can collect more data on a large number. While experimental more control over confounding variables and can establish cause and effect relationships.

Analysing Data:

After collecting data of a research, there comes the second step how you will decide how the data will be analysed. Data analysing helps to go depth of a particular subject. Data analysing is the process of evaluating data using the logical and analytical reasoning to carefully examine each component of data that has collected. In every research it is important and necessary to collect and analyse the data that has been collected, no research is complete without the analysing of data.

Analyse in Quantitative data:

In this data we can use statistical method to identify relationship between variables. In analysis of quantitative data, it often describes a situation or event, answering the "what" and "how many" questions you may have about something. The result of quantitative analysis in research can easily be standardized and shared among researchers.

Analyse in Qualitative data:

This data analysis of data is used to understand words, ideas, and experiences. We can use it to interpret data that was collected:

From open-ended survey and interview questions, literature reviews, case studies, and other sources that is used to collect data that is in text rather than numbers.

Using non probability sampling methods.

Qualitative analysis tends to be quite flexible and relies on the researcher's judgement, so you have to reflect carefully on your choices and assumptions.

Advantage and Disadvantage of Information Technology:

The competitiveness of most companies is in a large degree based on the effective use of information technologies and information systems especially. The main purpose of information system is providing the right information to the right people at the right time. It is used to track, store, manipulate and distribute the information from gathered data to appropriate persons when necessary.

Advantages:

Communication:

With the help of information technologies, the instant messaging, emails, voice and video calls becomes quicker, cheaper and much efficient.

Globalization and cultural gap:

By implementing information systems, we can bring down the linguistic, geographical and some cultural boundaries. Sharing the information, knowledge, communication and relationships between different countries, languages and cultures becomes much easier.

Availability:

Information systems have made it possible for businesses to be open 24×7 all over the globe. This means that a business can be open anytime anywhere, making purchases from different countries easier and more convenient. It also means that you can have your goods delivered right to your doorstep with having to move a single muscle.

Creation of new types of jobs:

One of the best advantages of information systems is the creation of new and interesting jobs. Computer programmers, Systems analysers, Hardware and Software developers and Web designers are just some of the many new employment opportunities created with the help of IT.

Cost effectiveness and productivity:

The IS application promotes more efficient operation of the company and also improves the supply of information to decision-makers; applying such systems can also play an important role in helping companies to put greater emphasis on information technology in order to gain a competitive advantage. IS has a positive impact on productivity, however there are some frustrations can be faced by systems users which are directly linked to lack of training and poor systems performance because of system spread.

Disadvantages:

Unemployment and lack of job security:

Implementing the information systems can save a great deal of time during the completion of tasks and some labour mechanic works. Most paperwork's can be processed immediately, financial transactions are automatically calculated, etc. As technology improves, tasks that were formerly performed by human employees are now carried out by computer systems.

Dominant culture:

While information technology may have made the world a global village, it has also contributed to one culture dominating another weaker tone. For example, it is now argued that US influences how most young teenagers all over the world now act, dress and behave. Languages too have become overshadowed, with English becoming the primary mode of communication for business and everything else.

Security issues:

Thieves and hackers get access to identities and corporate saboteurs target sensitive company data. Such data can include vendor information, bank records, intellectual property and personal data on company management. The hackers distribute the information over the Internet, sell it to rival companies or use it to damage the company's image. For example, several retail chains were targeted recently by hackers who stole customer information from their information systems and distributed Social Security numbers and credit card data over the Internet.

Implementation expenses:

To integrate the information system, it requires pretty good amount of cost in a case of software, hardware and people. Software, hardware and some other services should be rented, bought and supported. Employees need to be trained with unfamiliar information technology and software.

Information systems contribute to the efficient running of organizations. Information systems are showing the exponential growth in each decade. Today's information technology has tremendously improved quality of life.

Conclusion:

Use of technology in researchis so extensive that it is difficult to conceive today a scientific research project without Information Technology. Many research studies cannot be carried out without use of Technology particularly those involving complex computations, data analysis and modelling. Technology in research is used at all stages of studyfrom proposal/budget stage to submission/presentation of findings. Mostly Research are done to identifying a problem and then solve the problem.