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15. Significance of Information Technology for the Protection of Environment and Human Health

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Figure 15.1: Information Technology for the Protection of Environment

Abstract:

Today is an information age and tremendous flow of information is emerging in all fields throughout the world. One cannot live life without information. Various technologies have been developed for environment and health care which is user friendly which contributes tremendously in environment education and health care. Development of computer, satellite and telecommunication etc. has resulted in total revolution on all aspect of life as they give up-to-date information on various aspects of environment and health. India is endowed with rich natural resources while facing the problems of poverty, illiteracy, population growth, environmental degradation etc., Information technology is creating new possibilities to tackle these problems. Information technology plays a key role in human health. It has changed the human life style completely.

Keywords:

Information Technology, Healthcare, Environment, poverty, illiteracy, population growth.

15.1 Introduction:

Information technology is a process of studying or using system like computer for retrieving, storing and sending information[1-7]. Upgrades of the technology have left a potential impact on the status of environment and Healthcare as compared to other respective areas. There has been a tremendous growth in the Internet Services and facilities like Geographical Information System GIS, data that is transmitted from satellite etc. which have generated a greater influence on environment education and human health. Remote sensing and GIS can be used in environment where it provides digital data that can be used to produce maps and graphic displays for analysis and presentation purposes. Super computers are used for calculating weather and climate situations. The MRI machine and the others scan equipment's that are used in the Healthcare are also compatible for working with computers. Technologies that are related to human health allows patient to have information about their Medicare. Websites are also available that guide the patient regarding various health information like diet plan, medicines etc. Internet services are becoming a powerful tool that helps increase human knowledge and awareness about environmental issues. With advances in technology, we can access and monitor environmental issues from anywhere in the world[8-11].

The major advantage of information technology is that it has highly developed infrastructure which could be used for accessing scientific knowledge about the environment. Today various internet services and a website are available that provide knowledge to the people regarding their Healthcare and diagnosis. Government has also taken major efforts in this direction by using telemedicine in providing information to the patient regarding their health status on their computers or mobile phone. GIS act as a barrier for both environment and Healthcare as it plays an important role in mapping the resources, environment conservation, management and planning these impacts. It also helps in identifying various disease infected areas. Database management systems will also be used for storing and retrieving data whenever required.

In environment system, the expansion database is used for wildlife, wasteland conservation etc. Database is available in healthcare for storing the status of patient's history. These databases are used in the lab systems, patientsatisfaction system, patient identification, billing and payment processing etc.

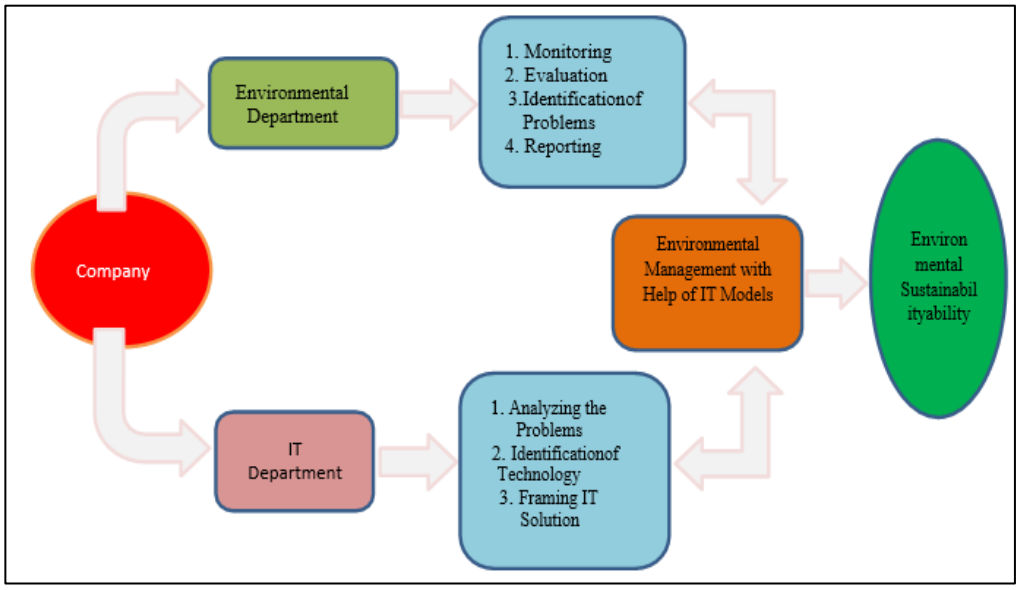

Chart 15.1: Information Technology for the Protection of Environment

15.2 Role of IT in Environment:

With advances in technology, it has a few good as well as bad effects which are directly or indirectly having an impact on the environment. With Internet facilities and services now available, all the information related to environment can be found online which makes it easily available. It also provides up-to-date environmental information like weather, climate change etc. Information Technology has helped in storing digital data which can be edited and modified according to when it will be required. It directly contributes to the Environment protection. GIS has a major contribution and has worked as an effective tool for environment.

It helps to provide reliable and verifiable information about forest covers and conservation. A number of modern technologies are available which provide acquisition, processing, storage and retrieval information. There are a number of programs which the government has initiated out of which one is Environment Information System. The ministry of Environment and Forest created an information system which is web enabled and comprehensive portal that provides information on environment[12-15]. It has a database which is run by the Ministry of environment forest and climate change. This center also acts as the medium for information collection, collation, storage and retrieval of specific subject areas. Another initiative is United Nations Environment Program. it is a program which coordinates and assists developing countries in implementing environmental related policies and practices.

With this program Information Technology has majorly contributed in decision making. The technique of Remote sensing is also being used to assess the ongoing changes in the environment which can be latter used to predict natural calamities like floods, hurricane, earthquakes etc., Some of them are:

A. National Management Information System (NMIS):

NMIS is a database compilation tool that is based on research and environmental development projects. It also can be used for gathering scientific information and is used by scientists worldwide.

B. Environmental Information System (ENVIS):

On December 1982, the Government of India after realizing the importance of environmental information established in ENVIS. The main objective of this database is to provide information to all the technical experts over the country. ENVIS has also tied up with several Institutions and Organization so the whole environment program would the meaningful. Several centers of ENVIS have been developed in the recent years in conjunction with the focal point in the ministry of Environment and Forest. Its foremost objective is to build storage repositories and dissemination centers for environment science.

C. Geographical Information System (GIS):

The geographical information system is mainly used for capturing, analyzing and storing data that has been obtained from the Geographic position of the Earth surface. It is the tool that maps relationship, patterns and their respective trends. Geographical information system stores spatial data in digital mapping environment, it can also be used for analyzing the data and planning quick comparative view of highly prone areas. It can also be used to produce graphical maps and patterns which can later be used for analysis and presentation purpose. GIS plays an important role analysis and in formulating quick mitigation.

D. Remote Sensing

It involves gathering information through satellites which could be used to find the alterations in the environment and also protect against natural disasters such as floods, Hurricane, cyclone etc. before they can attack the planet. Active sensors are used for scanning objects which help us detect and measure the radiations that are reflected from target. The sensors are usually mounted on the top of the satellite or airplanes which then record the activities which are emitted from the surface of the earth.

E. Worldwide Web (WWW):

The world wide web the powerful tool in providing information regarding all the social political and economic aspects. All information about the environment its causes, hazards and how to overcome them can be obtained from the worldwide web.

F. Computer Aided Design (CAD):

Computer aided design is used for accurately creating photo simulation that is required in the preparation of environmental impact report. It also helps in minimizing the negative impacts of Planning and development which can be measured in terms of carbon footprint, energy consumption and a water impact.

G. Satellite Technology:

Satellites are used for monitoring the climate change as they monitor the concentration of greenhouse gases in the atmosphere such as aerosol, water vapor carbon monoxide, carbon dioxide and methane. It can also be used for monitoring the changes and help in promoting responsible use of land and natural resources in order to protect our ecosystem. It helps us in monitoring the health of our forest. Canada producers a yearly crop inventory that help the farmers better by using the satellite imagery.

15.3 Role of IT in Health Care:

Information technology is being used in countless ways to improve Healthcare by keeping patient's safety and by maintaining a healthy between patients and Healthcare providers. The most effective way in which information technology being used in healthcare is with the management of data and patient record. Instead of having to document everything manually, hospital scan now tracks patient record securely with all the patient's history, medicine charts and diagnosis which they can read and share against the various doctors and can also keep that information in their database. Electronic Medical Record (**EMR**) are used for keeping patient's information and their safety reports. These electronic records are replacing the manual record which is a game changer in the medical world.

It provides immediate electronic access to a person and also provide support for processes that are related to healthcare delivery. Nursing Informatics is an interdisciplinary study that links nursing with IT. Nurses that use IT are likely to find spot medical errors then a normal person. Telemedicine is also playing and integrate role in various areas of hospital, Laboratories, medical record department and pharmacy. Hospital information system also covers various aspects like inpatient and outpatient billing, insurance, reimbursement procedures and pharmacy.

Intranet that is hospital intranet is based on the TCP/IP Protocol which is only accessible by the organization members, employees and the ones that have authorized access. It includes facilities like organizational growth and knowledge sharing.

The first professional Healthcare Informatics Organization was started in Germany, whose main concern was managing the resource devices and methods that are required for optimizing storage, retrieval and information about healthcare and biomedicine. Information systems in healthcare have benefited the overall cost, quality, accessibility and delivery. The use of information technology in healthcare in expanding tremendously and can emerge on top in the recent years. Some of them are:

A. Electronic Medical Record (EMR):

EMR provides real time access to patient's information such as medical condition, medicines, diagnosis, patients follow up etc. which will be important for decision making. It is used by General practitioner surgeon and all physician. With everything documented online, it is easy to access anything anytime without the hustle of maintaining all the documents manually. All the health-related information is gathered and managed by the authorized clinicians and staff. Medical information about a patient is stored on the computer which can then be accessed by a few physicians to view the patient's history, medication and a lot more things can be done from a single screen.

B. Clinical Decision System:

It is a support system that is designed for physicians and professional Healthcare experts for clinical decision support (**CDS**) which can for the assist them in decision making task. It also provides computerized a lot and reminders to patients and the latter professional expertise that contribute in maintaining the clinical workflow.

It is important as it provides timely information to clinicians and patient to make them aware of the decisions about healthcare operation management and other planning supports systems. The benefit of clinical decision support is that we can access all the information in one place which therefore reduces the risk of medication error.

C. Computerized Physician Order Entry (CPOE):

It is identified as a Core component for improving the Healthcare delivery. It is a practice that gives medical practitioners instructions about the treatment to be given to the patients under expert guidance. These orders are communicated through and over computer networks. All this information is shared with the medical staff and with organization that is responsible for fulfilling all these orders.

D. E-prescription:

It is a computerized process of generating, transmitting and fulfilling the patient's prescription. The communication take place between the prescriber, the patient and the pharmacy through which the prescription is shared. It also provides error free and accurate prescription. The most significant benefit is to deliver these prescriptions or medicines to the caretaker and the patients. Nowadays it is gaining tremendous popularity and is growing rapidly.

E. Healthcare information exchange:

It is a computer information exchange tool that shares patient's health information across healthcare providers. The information that is being exchanged should be safeguarded and secured. Also, that Authentication and authorization plays an important role in such exchange. All the information should be confidential among various Healthcare providers.

F. Personal Health Record (PHR):

It is an application which was maintained and managed by the individual patient or the consumer. It has a static repository for patient's data which combines data, knowledge and software tools that help patient to become an active participant in their own care. PHR represents repository for patient data and also includes a decision support capability that can assist in managing patients' chronic condition. There are two main types of PHR that is Stand-alone PHR and Connected PHR. The benefit is to track and access Health Care records and your progress as well.

G. Remote Patient Monitoring (RPM):

RPM is a technology in which the patient is monitored outside the clinic or hospital so as to increase the access of healthcare and reduce their Healthcare cost. All this care is delivered on the network through telecommunication.

H. Tele Health:

It is a healthcare technology that provides health related services with the help of computers and telecommunication Technologies. It helps in communicating with long distance patients who cannot travel from such far places. Tele health is different from telemedicine because it refers to remote Healthcare services then telemedicine. Tele health provides non clinical services like a providing training administrative meeting and continual medical education. It involves video conferencing, remote monitoring, storing and forwarding images etc.

I. Clinical Data Processing (CDP):

Clinical data processing or data management is a process of collecting, integrating and making the data available at an adequate cost and appropriate quality. It involves monitoring the patient either continuously or periodically. The ultimate goal here is to ensure that all the conclusions which are drawn from research are supported by the data. This goal will help in protecting the public health and confidence in healthcare.

J. Health Information Exchange (HIE):

It is an electronic device that is used for managing Healthcare related data which are included in medical facilities, health information organization. It allows doctors, nurses, healthcare providers to securely access patient's information. It also makes it possible to move patient's information across various healthcare organizations.

15.4 Conclusion:

Environmental sustainability is one of the utmost important world-wide challenges of the 21st Century. Information systems are an important but ineffectively stood weapon in the arsenal of organizations in their environmental sustainability by permitting new practices

processes in backing of belief formation, action formation, and outcome asses. Information Technology has greatly contributed in bringing up the environment and healthcare. With the help of Information Technology, a healthcare system is now all computerized and secure for exchanging information between consumers, providers and has also helped in improving patient's safety. Information Technology can also be used to develop and built environment. Information Technology tools and software's play an important role in environmental studies like disaster management, weather information, forest information etc. The research paper draws attention on how Information Technology has helped in improving environment and healthcare. Information Technology will definitely play a major role in Environmental Protection and Human health care with its benefits. That will lead to cleaner, greener and sustainable universe in the future.

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