

COMPUTER AND DIGITAL GEOGRAPHY: AN UPCOMING BRANCH

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ABSTRACT:

Geography is the study of the physical features of the earth and its atmosphere, and of human activity as it affects and is affected by these, including the distribution of populations and resources and political and economic activities. The digital technologies changed geography study very fast. Digital geography offers the opportunity to study almost every place in the world anytime anywhere. This paper provides an overview of the development of geographies based on new digital technologies.

Keywords: *Technology, Digital Geography, GIS, Digital Earth.*

INTRODUCTION

Charles Babbage originated the concept of a digital computer (Copeland, B. Jack, Dec 18, 2000) and it can be said that beginning of the digital era by his hand. Human life is dependent on technology everywhere. Digital technologies are being increasingly used by people (Geographers, researchers, students). Digital and its study are changing in subtitle and dramatic ways in the rapid transition to a digital world (Battey Michael, May-June 1997). So in present trend Digital Geography as a branch of Human Geography is quite desirable. Screens, information, and speed. These three words define how students in the 21st century are used to interacting with the world. These students, sometimes referred to as the digital generation² are students who are growing up constantly connected to the world around them through smart phones, tablets, and computers. Because of this hyper connectivity, students will learn differently. Members of the digital generation thrive on creative and engaging activities, varied sources of information, and a more energetic environment. So it is important to change and adapt in the geography study for digital generation to fulfill their need.

OBJECTIVE

To know the uses of technology in Geographical field

To understand the global strategy and find out the changes with globalization and technological advancement.

METHODOLOGY

Literature review based secondary data analysis is used in whole work.

RESULT AND DISCUSSION:

Use of technology for work, learning and socially:

Table 1:

Percentage using Technology	Students		Workers	
	Learning (%)	Social (%)	Working (%)	Social (%)
Information Search and Publishing	94	99	88	98
One to One Communication	96	98	97	98
Simulation and Gaming	17	63	10	56
Collaboration	89	93	91	89
Publishing	26	63	25	55

Data source: <https://www.slideshare.net/guest50fdb1/digital-generation-survey-2008-technology-part-1-presentation>

Table 2:

Online Activities: India

	Email (%)	Chat (%)	Info (%)	Entertainment (%)	e-commerce (%)
School Students	37	11	31	21	0
College Students	31	19	35	13	2
Young Men	54	12	16	11	7
Older Men	58	6	15	15	6
working Women	52	9	21	13	5
Non-Working Women	51	13	17	14	5

Data Sources: IMRB International / IAMAI, 'Internet in India 2007'

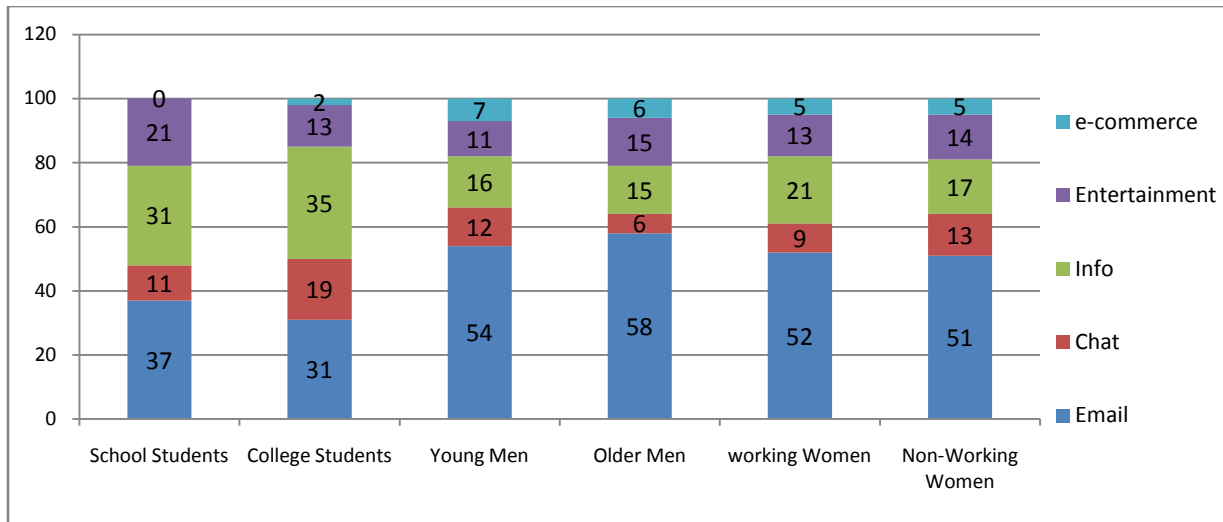


Figure-1

Younger generations are heavily influenced by technology. In Today’s world, the development of younger generations greatly affected by technology, it changes the experience of childhood not just socially, but also in both cultural and economical aspects.

DIGITIZATION IN GEOGRAPHY:

Digitization is the process of converting information into a digital format. In this format, information is organized into discrete units of data (called bits). This is the binary data that computers and many devices with computing capacity can process. Text and images can be digitized similarly: a scanner captures an image (which may be an image of text) and converts it to an image files, such as a bitmap. Audio and video digitization uses one of many analog-to-digital conversion processes in which a continuously variable (analog) signal is changed, without altering its essential content, into a multi-level (digital) signal. The process of sampling measures the amplitude (signal strength) of an analog waveform at evenly spaced time markers and represents the samples as numerical values for input as digital data.

Digitizing information makes it easier to preserve, access, and share.

Software uses in Geography Education

Using GIS tools users can search information about specific geographical areas, analyze spatial information, edit the data and create maps, charts and create reports.

Few examples of GIS tools are:

GRASS GIS, QGIS, gvSIG, MapWindow GIS, SAGA GIS, ESRI Arc, Intergraph, MapInfo, Clark Labs IDRISI, Google Earth, Capaware, FalconView, TerraView, Whitebox GAT, GeoServer, Mapnik, MapServer, Spatialite, TerraLib

Used Digital Instrument in Digital Geography:

Remote sensing has been playing an important role in cartography and studies of different spatial phenomena for decades. Over the last 20 years, it has become the most prominent tool to make weather forecasts, in the surveillance of wildfires, for mapping deforestation, alterations in vegetation cover and the coverage of the polar ice-caps, as well as military surveillance and civil cartography^{2,5}. Remote sensing is the process of acquiring information about a place from a distance. Such collection can occur with devices based on the ground, and/or sensors or cameras based on ships, aircraft, satellites, or other spacecraft. Nowadays, the data obtained is usually stored and manipulated using computers. The most common software used in remote sensing is ERDAS Imagine, ESRI, MapInfo, and ERMapper.

“An information system that is designed to work with data referenced by spatial or geographic coordinates. In other words, a GIS is both a system with specific capabilities for spatially-referenced data, as well as a set of operations for working [analysis] with the data”. (Star and Estes, 1990)

“A system of hardware, software, and procedures designed to support the capture, management, manipulation, analysis, modeling and display of spatially-referenced data for solving complex planning and management problems”. (NCGIA lecture by David Cowen, 1989)

“A system for capturing, storing, checking, integrating, manipulating, analyzing and displaying data which are spatially referenced to the Earth”. (Chorley, 1987)

A Geographical Information System (GIS) is an automated system for capturing, storing, analyzing and managing and displaying spatially referenced data. It is an information system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically referenced information. In a specific sense, GIS is a software tool that allows users to create interactive queries, analyze the spatial information, edit data, maps, and present the results of all these operations. GIS technology is becoming essential tool to combine various maps and remote

sensing information to generate various models, which are used in real time environment. Geographical information system is the science utilizing the geographic concepts, applications and systems.

Micheal Wood (Vice-President of the International Cartographic Association (ICA) in his opening speech at the International Cartographic Conference (ICC) in Ottawa 1999) mentioned “that it is said humankind has invented three great forms of communication: language, music and mapping, but by far the oldest is mapping. Technology has been driving force behind many changes in Cartography”

“Map users in the twenty-first century will witness changes in the visualization and application of spatial information. The convergence of enabling technologies, such as automated positioning, wireless communication, and digital spatial information handling, will permit the development of previously non existing implementations of cartographic communication”. (Burnett &Kalliola 2000).

Digital technologies have influenced the roles of maps and cartography. Using digital cartography map production will be quicker and more intelligent, while maps will become more attractive, diverse, and interactive. Cartographers will be free from heavy map editing work, and can be used in more detail.

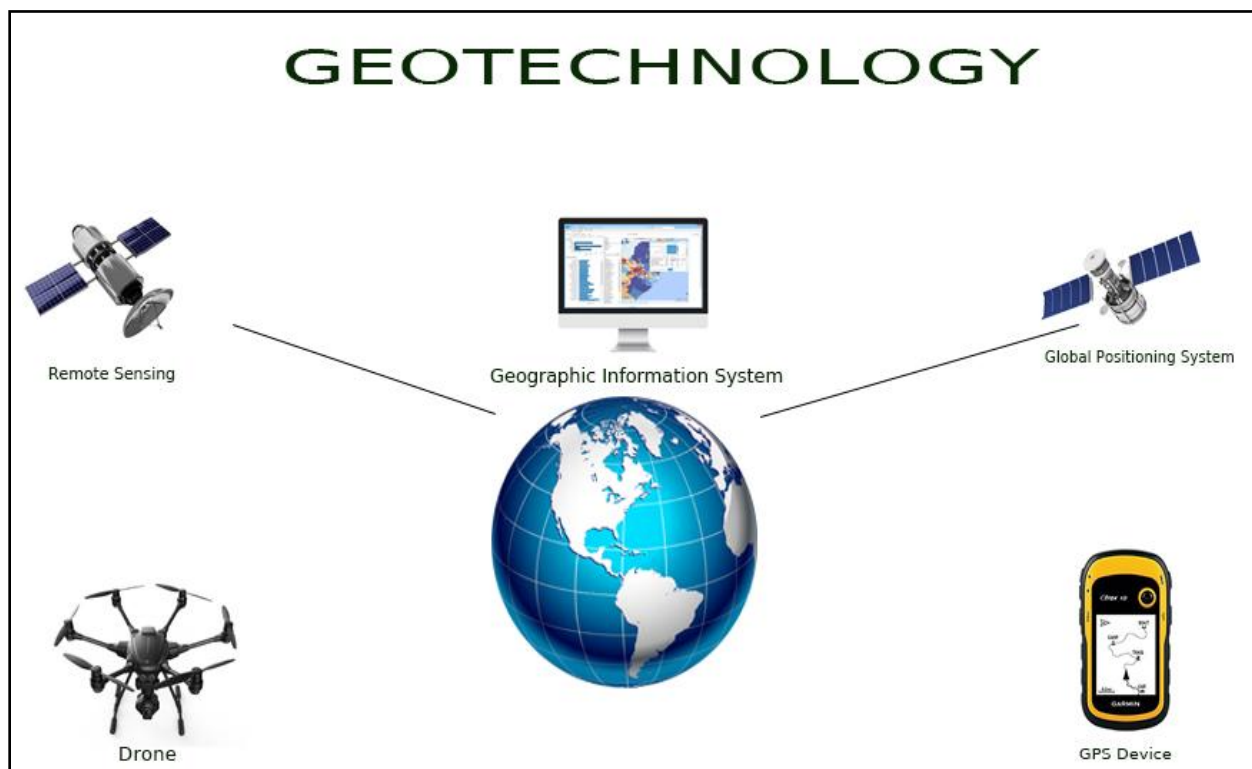
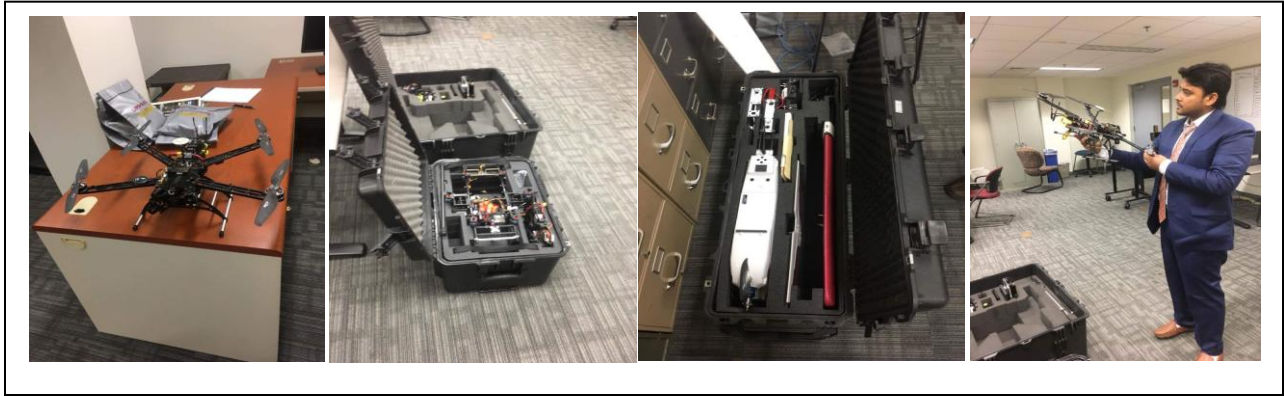


Figure-2

Few Examples of Digital instruments used for Geographical Study:



Digital instruments used for Geographical Study in State University of New York

Digital Library for E-geography:

“An organization, which might be virtual, that comprehensively collects, manages and preserves for the long term rich digital content, and offers to its user communities specialized functionality on that content, of measurable quality and according to codified policies”. ("Digital Library")

Libraries play crucial role in learning and research process. A digital library can provide access to many of the knowledge networks around the world, which is a necessary component of any learner and researcher. Digital libraries combine technology and information resources. Digital libraries have removed the physical barriers of traditional libraries by making accessible huge amounts of information in digital form through variety of electronic tools. E-geography is digitally enriched with huge range of geographical resources (e-resources).

Digital Geography: Digital geography is an area of study that concentrates on the digitally capture, storage, manipulation, and analysis of geographic data.

Advantage of Digital Geography:

Cartography and Computer-Assisted Drafting: Computers offer the same advantages to cartographers that word-processing software offers writers. Automated techniques are now the rule rather than the exception in cartographic production.

Photogrammetry and Remote Sensing: Aerial photogrammetry, a well-established technique for cartographic production and geographic analysis, is now complemented by the use of "remotely sensed" information gathered

by satellites in outer space. Information technologies have made both sorts of information far more readily available and far easier to use.

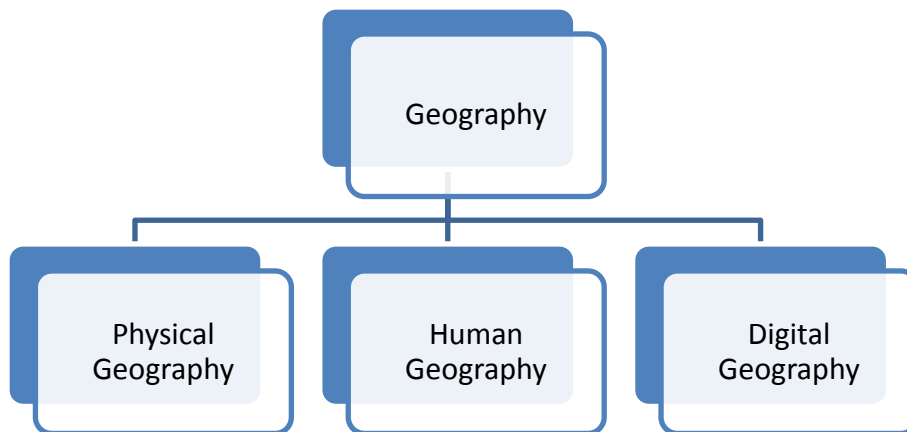
Spatial Statistics: Statistical analysis and modeling of spatial patterns and processes have long relied on computer technology. Advances in information technology have made these techniques more widely accessible and have allowed models to expand in complexity and scale to provide more accurate depictions of real-world processes.

Geographic Information Systems (GIS): These systems allow geographers to collate and analyze information far more readily than is possible with traditional research techniques. As will be noted below, GIS can be viewed as an integrating technology insofar as it draws upon and extends techniques that geographers have long used to analyze natural and social systems.

Communication and Collaboration: Electronic mail, discussion lists, and computer bulletin boards make it far easier for colleagues to communicate ideas and share ideas, locally, nationally, and internationally. Distance-learning techniques make it possible to hold interactive classes and workshops simultaneously at distant locations.

Access to Library and Research Materials and Sources: Network access to both primary and secondary research resources is expanding rapidly. From their offices, scholars can now get information held by libraries, government agencies, and research institutions all over the world.

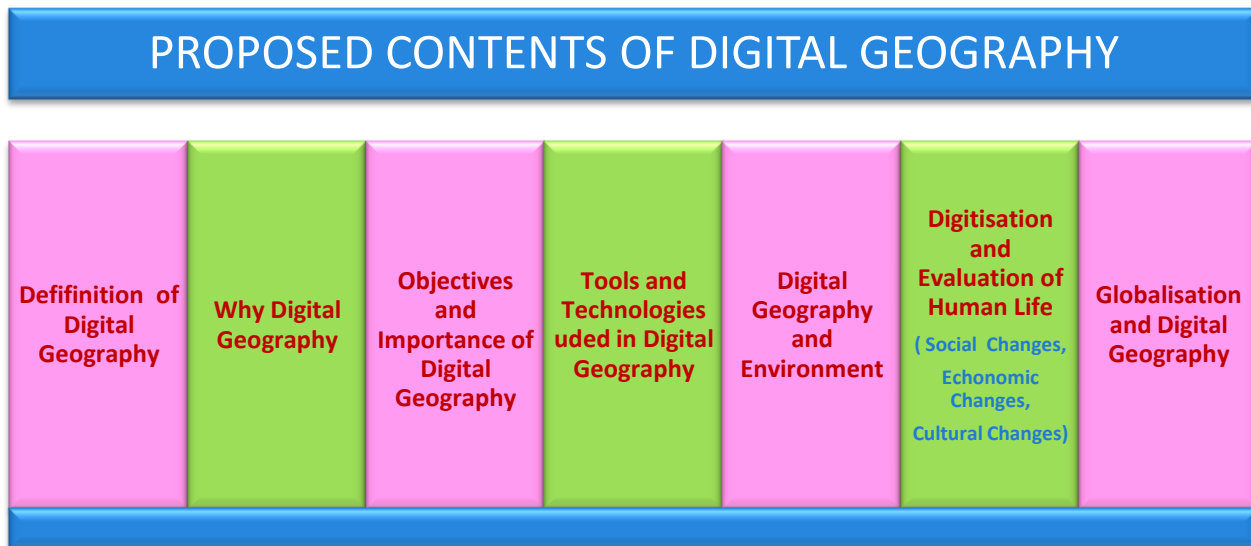
Publication and Dissemination: Information technologies are reducing substantially the cost of publishing and distributing information as well as reducing the time required to circulate the latest news and research results.



Different Branches of Geography

All across the world, educational Institutes are undergoing a transformation in teaching and learning with the help of digital technology. As educators re-imagine educational Institutes in new and different ways, Digital Learning Day provides an opportunity to collaborate with cooperator, share ideas, try new digital tools, and celebrate education innovation.

No other technological innovation in human history has affected the practice of geography in such a profound way as the computer. It has drastically transformed both geography as an academic discipline and the geography of the world. (Sui and Morrill, 2004: 82). Digital Geography is a branch Geography. With the help of the Digital Geography we can manipulate & analysis different types geographical data (digital maps, statistical data) through computer. It also discusses the social and cultural changes in the socio-economic environment of human life.



CONCLUSION

Living in a fast-paced society, it is essential to meet the market demands for quicker and more efficient service delivery. In order to improve working efficiency, shorten working period and create competitive advantage, student and researchers are required to be familiar with different kinds of technology used in geography, data processing and map-making software.

Development of geographies based on new digital technologies such as computer, mobile, internet. Computer technology and GIS bring to have the potential for revolutionizing geographic learning, offering learner access to

the information world and powerful tools for thinking geographically. So, there is no doubt about the importance of digital system to learning geography. Geography is a dynamic science. In addition to spatial and temporal changes, geography has been divided into different branches at different times as per requirement. Therefore, digital geography can be considered as the geography branch of geography, judging the importance and usefulness of the digital system.

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