



TRENDS IN THEMATIC CARTOGRAPHY AND VISUALISATION IN INDIAN EDUCATIONAL CURRICULA

Dr. Vijay Bahuguna¹ and Narendar Kumar²

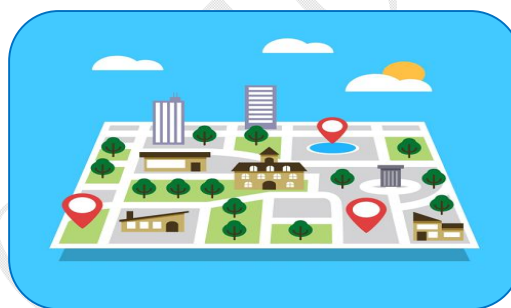
¹Assistant Professor, Department of Geography, D.B.S. (P.G.) College, Dehradun (U.K.)

² Narendar Kumar, Research Scholar, Department of Geography, D.B.S. (P.G.) College, Dehradun (U.K.)

ABSTRACT :

From customary cartography to advanced and data cartography, the cartography in china has made incredible improvement in a long time since 1949. This report outlined the accomplishment in cartography and press strategies, programmed speculation of advanced guide, map book, GIS programming, perception of geographic data and VGE methods, spatial information mining and learning disclosure, vulnerability of spatial information and cartography hypothesis. In view of condense, the course of improvement is advanced by 6 fields: absorption of spatial information, geo-examination and spatial information mining, geographic data administrations dependent on web, insight of spatial information speculation, combination of GIS and VGE and the hypothesis cartography dependent on 'multi-design', 'space time', 'coordination' perception model.

The new web mapping worldview has made energizing conceivable outcomes for anybody to creator and distribute topical maps utilizing ArcGIS Online. You don't need to be a cartographer, however realizing what makes an effective guide causes you plan a guide that individuals will need to utilize and investigate. It will urge you to create inventive methods for planning and envisioning your information.



KEYWORDS : *customary cartography to advanced and data cartography , cartography hypothesis.*

INTRODUCTION

Cartography or mapmaking (in Greek chartis - map and graphein - compose) is the investigation and routine with regards to making portrayals of the Earth on a level surface. The order of cartography joins science, feel, and specialized capacity to make a reasonable and intelligible portrayal that is fit for imparting data viably and rapidly.

Cartography, anyway automated it moves toward becoming, stays both a science and a workmanship. The feel of some random guide will consistently be a basic segment basic to the movement of data. A guide must give precision and in the best of arrangements, a creative introduction of information or examination of information, however consistently in a structure that is promptly intelligible and welcoming to the peruser. A guide is both more, and less, than basically topographical or physical space. What's more, it is consistently a consequence of imaginative and specialized decisions, making something both helpful and, once in a while, wonderful.

One issue in making maps is the basic reality that the outside of the Earth, a bended surface in three-dimensional space, must be spoken to in two measurements as a level surface. This essentially

involves some level of mutilation, which can be managed by using projections that limit twisting in specific regions. Besides, the Earth is certainly not an ordinary circle, yet its shape is rather known as a geoid, which is an exceptionally unpredictable yet precisely understandable and measurable shape.

Maps of all scales have customarily been drawn and made by hand, however the utilization of PCs has changed cartography. Most business quality maps are presently made with programming that can be categorized as one of three fundamental sorts: CAD, GIS, and concentrated delineation programming.

Working as instruments, maps impart spatial data by making it noticeable. Spatial data is gained from estimation of room and can be put away in a database, from which it tends to be separated for an assortment of purposes. Current patterns in this field are moving endlessly from simple techniques for mapmaking and toward the production of progressively unique, intelligent maps that can be controlled carefully.

Cartographic portrayal includes the utilization of images and lines to outline geographic wonders. This can help in imagining space in a theoretical and convenient organization. The cartographic procedure lays on the reason that the world is quantifiable and that we can make solid portrayals or models of that reality.

Etymology

The expression "Cartography" was begat in 1859, from the French, *carta* significance card and -graphie, from the Greek, which means to compose, or to draw. [1] A somewhat unique rendition finds the term getting from Old French *carte*, or guide, with its foundations in Latin *charta*, or *carta*, which means paper produced using papyrus. *Graphie* is the French for *graphia*, from the Greek for composing. [2]

History

Duplicate (1475) of St. Isidore's TO guide of the world Maps have been a huge piece of the human story for quite a while (maybe 8,000 years - no one knows precisely, yet longer than composed words). They were known to have existed in social orders of Europe, the Middle East, China, India, and others. The soonest realized guide to date is a divider painting of the old Turkish city of Çatal Hüyük which has been dated to the late seventh thousand years B.C.E. [3] Other known maps of the old world incorporate the Minoan "Place of the Admiral" divider painting from c. 1600 B.C.E. demonstrating a coastline network in an angled viewpoint, and an engraved guide of the heavenly Babylonian city of Nippur, from the Kassite time frame (fourteenth - twelfth hundreds of years B.C.E.). [4] The antiquated Greeks and Romans made maps starting with Anaximander in the 6th century B.C.E. In antiquated China, albeit land writing ranges back to the fifth century B.C.E., the drawing of genuine topographical maps was not started decisively until the principal half of the Han Dynasty (202 B.C.E.- 202 C.E.), with crafted by Prince Liu A (179 B.C.E.- 122 B.C.E.).

Mappa mundi is the general term used to depict Medieval European maps of the world. Roughly 1,100 mappae mundi are known to have made due from the Middle Ages. Of these, somewhere in the range of 900 are found showing compositions and the rest of as remain solitary archives [5].

In the Age of Exploration from the fifteenth century to the seventeenth century, cartographers replicated prior maps (some of which had been passed down for quite a long time) and drew their very own dependent on voyagers' perceptions and new looking over strategies. The development of the attractive compass, telescope, and sextant expanded precision. Because of the sheer physical troubles innate in cartography, map-creators much of the time lifted material from before works without offering credit to the first cartographer. For instance, one of the most well known early maps of North America is informally known as the Beaver Map, distributed in 1715 by Herman Moll. This guide is a precise generation of a 1698 work by Nicolas de Fer. De Fer thus had replicated pictures that were first imprinted in books by Louis Hennepin, distributed in 1697, and François Du Creux, in 1664. By the 1700s, map-producers began to offer credit to the first etcher by printing the expression "After [the unique cartographer]" on the work. [6] Not all maps were drawn on paper. Very much looked into models incorporate the navigational stick graphs of the Marshall Islanders, intertwined sticks

masterminded to delineate separations crosswise over oceans, wave fronts, and heights of islands. Local Alaskans cut mind boggling figures that reproduced coastlines and heights in a convenient, and very precise, three dimensional structure. [7]

Technological changes

In cartography, new innovation has been joined into the creation of the maps of new ages of mapmakers and guide clients. The principal maps were physically developed with brushes and material, were changed in quality and of constrained appropriation. The appearance of attractive gadgets, similar to the compass and, a lot later, attractive capacity gadgets, prompted the production of unmistakably progressively precise maps and the capacity to store and control those maps carefully.

Advances in mechanical gadgets, for example, the printing press, quadrant, and vernier calipers took into consideration the large scale manufacturing of maps and the capacity to make exact proliferations from progressively precise information. Optical innovation, for example, the telescope, sextant, and different gadgets that utilization telescopes, took into account exact studying of land and enabled the mapmakers and guides to discover their scope by estimating edges toward the North Star around evening time or the sun around early afternoon.

Advances in photochemical innovation, for example, the lithographic and photochemical procedures, have taken into account the production of maps that are finely point by point, don't twist fit as a fiddle, and oppose dampness and wear. These advances wiped out the requirement for etching, further shortening the time it takes to make and duplicate maps.

In the late twentieth century and mid twenty-first century, progresses in electronic innovation prompted another upset in cartography. In particular, PC equipment gadgets, for example, PC screens, plotters, printers, scanners (remote and record), and scientific stereo plotters alongside perception, picture preparing, spatial investigation and database programming, have democratized and enormously extended the creation of maps. The capacity to superimpose spatially found factors onto existing maps made new uses for maps and new ventures to investigate and misuse these possibilities.

The quick trade of data and learning are the fundamental conditions for fruitful and powerful research and down to earth applications in cartography. For effective research improvement, it is important to pursue patterns in this space, yet in addition attempt to adjust new patterns and advances from different regions. Patterns in cartography are additionally regularly themes of numerous meetings which have the principle expect to connection research, instruction and application specialists in cartography and GIS&T into one huge stage. Such the perfect spot for trade and sharing of information and aptitudes was additionally the CARTOCON2014 meeting, which occurred in Olomouc, Czech Republic, in February 2014 and this book is a gathering of the best and most intriguing commitments. The book substance comprises of four sections. The initial segment New methodologies in guide and map book making gathers learns about imaginative courses in guide creation and chart books assemblage. Following piece of the book Progress in web cartography brings models and instruments for web map introduction. The third part Advanced strategies in guide use incorporates accomplishment of eye-following exploration and clients' issues. The last part Cartography by and by and research is an unmistakable proof that cartography and maps assumed the noteworthy job in numerous geosciences and in numerous parts of the general public. Every individual paper is unique and has its place in cartography.

5 Popular Thematic Map Types and Techniques for Spatial Data

As our comprehension of Location Intelligence and its applications over the general population and private division develops, topical maps are turning into an increasingly basic piece of any expert's toolbox. Dissimilar to reference maps, which reveal to us where something is, topical maps disclose to us how something is. Topical maps pull in characteristics or measurements about an area and speak to that information in a manner that empowers a more prominent comprehension of the connections among areas and the revelation of spatial examples in the information that we are investigating.

There are various representation strategies and topical guide types that have various applications relying upon the kind of information that you are investigating and the sort of spatial examination that you are hoping to do. The procedure and the kind of guide that you need to make might be unique, for instance, in the event that you are investigating worldwide delivery information or voter penchant, or natural fiasco sway.

How about we investigate five topical guide representation strategies that are especially helpful to chiefs, experts, storytellers, and other people who are hoping to draw bits of knowledge from their information, recount to a ground-breaking story, or addition a more noteworthy comprehension of our general surroundings.

A choropleth guide is a topical guide where geographic districts are hued, concealed, or designed in connection to a worth. This kind of guide is especially valuable when imagining a variable and how it changes crosswise over characterized locales or geopolitical territories. For instance, a choropleth guide is very valuable when seeing vote aggregates by ideological group per area in the United States, as beneath. In a choropleth map, shading can be utilized to speak to unmistakable traits or, as in the model beneath, to speak to weight of a worth (a solid or feeble gathering vote-share appeared as light or dull hues). Fun Fact: the normal utilization of red and blue to speak to Republicans and Democrats separately, is a cutting edge marvels. Built up during the 2000 Presidential Election, when the extended discussion over outcomes lead to choropleth maps being a staple of political news inclusion, organizations bit by bit chose the red as republican/blue as democrat shading plan to furnish watchers with a typical seeing paying little mind to their favored news source.

2. Warmth maps

A warmth guide speaks to the force of an episode's event inside a dataset. A heatmap uses shading to speak to force, however not at all like a choropleth map, a heatmap does not utilize geological or geo-political limits to gather information. This procedure requires point geometries, as you are hoping to outline recurrence of an event at a particular point. Imagining the power of event utilizing a warmth guide is a procedure normally utilized when following climate and common marvels, in which set up fringes and limits are less valuable for understanding effect regions. In the warmth map underneath, dry spell conditions over the United States are imagined dependent on force, giving us a more prominent comprehension of past and potential effect regions.

3. Relative image maps

A relative image guide can speak to information attached to a particular topographical point or information that is collected to a point from a more extensive territory. In these maps, an image is utilized to speak to the information at that particular or total point, and after that scaled by worth, with the goal that a bigger image speaks to a more noteworthy worth. The size of every image can be corresponding to the worth you are picturing or you can set 3 to 5 'classes' of qualities considering examination and order of areas. Relative image maps are amazingly helpful for obviously recounting to the tale of your information, as in the above guide, indicating urban populaces by nation around the globe. Furthermore, with 4.5% surprisingly having some degree of partial blindness, a relative image guide adds a degree of openness to your representation over a portion of the more shading centered choices. Our Head of Cartography, Mamata Akella, has additionally given some prescribed procedures to structuring an incredible relative image map.

4. Spot thickness maps

A spot thickness guide utilizes a speck to speak to a component or quality in your information. Some spot thickness maps are 'balanced' in which each speck speaks to a solitary event or information point, or 'one to many' in which each dab speaks to a lot of totaled information, for instance one dab may speak to 100 people with a specific characteristic. Both of these kinds of dab thickness guide envision the disperse of your information, which can give bits of knowledge into where occasions of an event are grouped.

Fun reality: One of the best known early utilizations of Location Intelligence was John Snow's guide of cholera patients in London in 1854. A 'balanced' speck thickness map, Snow plotted each recorded instance of cholera and in an early case of spatial examination, had the option to establish that a high thickness of cases were bunched around a particular water siphon, the wellspring of the cholera episode.

5. Energized time-arrangement maps

To a greater degree a strategy than a sort, if your information has a transient segment (occurring after some time), you can change any of the above perceptions into an enlivened time-arrangement map. Taking a gander at your information after some time can both improve your capacity to pick up bits of knowledge and make a more grounded and all the more convincing visual. The model beneath envisions GPS information over a 24 hour time frame for a subset of autos utilizing a route framework in the city of Berlin. Putting your information on a suitable time scale will enable you to settle on significant business choices. Mapping pedestrian activity through the span of seven days, for instance, may advise hours regarding activity for a retail store while mapping and quickening a century of ocean level estimations can paint a clear picture on the effect of worldwide environmental change.

With numerous applications from social tuning in to asset the board to statistic projection, energizing your information as a period arrangement guide opens another measurement at which to see your information.

Didac India is an absolute necessity go to for everybody from the instruction and preparing part. It is India's just occasion where one can observe worldwide instruction and preparing assets and arrangements from more than 32 nations and update their establishment to worldwide models. More than 10 years the occasion has helped a huge number of foundations to upscale and update. Teachers from all over India and neighboring Asian nations visit the occasion to investigate the amazing grandstand of things to come of training.

Indian Educational Curricula:

Choice Based Credit System B.A./B.Sc. (Honours) Geography Syllabus				
CORE COURSE (14)	Ability Enhancement Compulsory Course (AECC) (2)	Skill Enhancement Course (SEC) (2)	Elective: Discipline Specific DSE (4)	Elective: Generic (GE) (4) (Optional)
I Geomorphology Cartographic Techniques (Practical)	(English/ Hindi/ MIL Communication)/ Environmental Science			GE-1
II Human Geography Thematic Cartography (Practical)	(English/ MIL Communication)/ Environmental Science			GE-2
III Climatology Statistical Methods in Geography (Practical) Geography of India		Remote Sensing (Practical) Or Advanced Spatial Statistical Techniques		GE-3
IV Economic Geography Environmental Geography Field Work and Research Methodology (Practical)		Geographical Information System (Practical) Or Research Methods (Practical)		GE-4
V Regional Planning and Development Remote Sensing and GIS (Practical)			Population Geography or Resource Geography Urban Geography or Agricultural Geography	
VI Evolution of			Geography of Health	

Present day science and innovation have gained colossal ground in every conceivable field. Geospatial innovation has been risen another spatial data innovation. Advanced Cartography is a recently risen field in Geospatial Technology. In the current changing worldwide situation there is more interest and degree for expertly prepared labor. To address this difficulty beginning of need based ability upgrading and vocation building courses encourage occupations, independent working gigs and strengthening of the understudies. Keeping in view the requirement for creating prepared HR,

mechanical application and making openings for work, the course in Digital Cartography has been proposed for the postgraduate understudies.

The fundamental target of the course is to give satisfactory expert learning and PC aptitudes to empower the understudies to take up profession in the field of Geospatial Technology. The course intends to accomplish the accompanying targets: To acquaint with the understudies another Geospatial Technology of Digital Cartography. To give calculated information and preparing in Remote Sensing GIS and GPS. To build up the aptitude of spatial information securing, the board, investigation, mapping and basic leadership and so forth prompting a raised profession profile and openings for work in the corporate segment. To pick up a comprehension of cartographic programming to deliver exact suitable persuading and inventive cartographic and realistic pictures. To make computerized maps mirroring the reason, substance and capacity of geospatial information. To advance logical and innovative applications in instructing and research work.

Better data prompts better choices. So as to get that data, we need the correct arrangement of apparatuses and strategies. Geospatial innovation incorporates remote detecting, land data framework and GPS. It has been fastidiously assembled, controlled, observed, dissected and mapped spatial information. It consolidates instruments and strategies of spatial and computational sciences. Advanced spatial information procured from remotely detected pictures examined by GIS and envisioned on PC screen or paper structure the center of geospatial innovation. Cartography is the learning related with the workmanship, science and innovation of maps. Maps speak to and convey about our universes. Maps depict spatial relationship among chose marvels of intrigue. In today advanced age billions of bits of information are gathered each day and a lot of this data incorporates a part that feels the geographic area of the information. Practically all maps of spots on the earth are made today utilizing automated frameworks. It is an instrument utilized catch, alter, store, controls, examinations and show spatial information. The advanced transformation has made an uncommon interest for individuals who comprehends and how to make and utilize maps.

STRUCTURE OF THE COURSE

Course Code: PGDDC

Paper Code: DC

Paper No	Title	Credit	Marks		
			University	Internal	Total
DCT: 101	Fundamentals of Cartography.	04	80	20	100
DCT: 102	Quantitative Techniques in Cartography.	04	80	20	100
DCT: 103	Thematic Mapping and Remote Sensing.	04	80	20	100
DCT: 104	Digital Mapping.	04	80	20	100
DCP: 105	Laboratory Work.	05	80	20	100
DCP: 106	Field Work and Project Work.	05	80	20	100
		26	480	120	600

Geomatics is a multidisciplinary science branch associated with a wide range of subjects, for example, studying, geoinformatics or remote detecting. Likewise cartography and spatial information representation speak to a significant piece of geomatics. What is the present position of cartography among previously mentioned sciences in geomatics educational program? It is important to understand that cartography changes confounded spatial information items to clear, comprehensible and appealing yields (maps and comparable items). Cartography outlines and exhibits all consequences of different pieces of geomatics. Additionally cartography impacts all controls concentrated on spatial information

catching and handling just as it is affected by them. This paper depicts the job of cartography (as the apparatus to spatial information representation and introduction) in geomatics educational program by and large, including connection to change of worldview of college training. The accompanying part demonstrates the best in class of cartographic courses (for example Topical Cartography or History of Maps and Mapping) and related subjects (for example Prologue to GIS or Social-financial Geography for Geomatics) at the University of West Bohemia in Pilsen (Czech Republic), where the solid association among cartography and geomatics has a long convention (over fifteen years). The last part presents the new exercises concentrated on cartography. It means research ventures (VisualHealth), organizing ventures (NeoCartoLink), instructive tasks (Multimedia Geomatics) and usage of consequences of single man and ace proposition. The new exercises are likewise associated with utilization of new information (space learning just as basic instructive learning) and cartographic patterns (web cartography, ongoing mapping or server answer for memorable and old maps)

REFERENCES

- [1] Bertin, J. (1967) *Semiology Graphique*, Mouton, Den Haag.
- [2] Card, S. K., MacKinlay, J. D. and Shneiderman, B. (1999) *Readings in information visualization: using vision to think*, Morgan Kaufmann, San Francisco.
- [3] DiBiase, D. (1990) Visualization in earth sciences. *Earth & Mineral Sciences, Bulletin of the College of Earth and Mineral Sciences*, 59, 13-18.
- [4] Finke, R. A., Ward, T. B. and Smith, S. M. (1992) *Creative Cognition: Theory, Research, and Applications*, The MIT Press, Cambridge, Mass.
- [5] Hearnshaw, H. M. and Unwin, D. J. (Eds.) (1994) *Visualization in Geographical Information System*, J. Wiley and Sons, London.
- [6] Keller, P. R. and Keller, M. M. (1992) *Visual cues, practical data visualization*, IEEE Press, Piscataway



Dr. Vijay Bahuguna
Assistant Professor, Department of Geography, D.B.S. (P.G.) College,
Dehradun (U.K.)



Narendar Kumar
² Narendar Kumar, Research Scholar, Department of Geography, D.B.S. (P.G.)
College, Dehradun (U.K.)