Cartography

Cartography can be concisely and classically defined as “the art science and technology of

making maps”. The popular associations of the word, with techniques of map making are a

reflection of its lexical routes in cart (French for map) and graffiti (Greek for writing).

More specifically cartography is a unique set of transformations for the creation and

manipulation of visual or virtual representations of spatial information, most commonly

maps, to facilitate the exploration, analysis, understanding and communication of

information about that space. Maps are a symbolized representation of a spatial reality

designed for use when spatial relationships are of primary interest. This sweeping definition

would encompass all types of maps, plans, charts and sections, three-dimensional models

and globes representing spatial (i.e information) or geospatial (i.e. information tied to the

earth) or any celestial body at any scale. Cartography therefore has many of variables of

meaning, but can be broadly considered as the process and study of map making. It is more

than an art/craft, or a technology for producing artifacts (maps); it is a science seeking to

abstract general truths and principles about this process.

The nature of cartography relates to the fundamental human need to have a spatial

awareness and knowledge of the environment. This has been expressed from times of

prehistory in cave drawings to the present-day in complex computer models, and virtual

worlds. In this sense maps have historically, and today continue to act as external aids for

spatial communication and facilitate the investigation, analysis and discussion of spatial

problems.

Defining maps

Put simply a map is a model of spatial information. Traditionally maps were often

classified according to their subject or purpose; navigation charts, cadastral maps showing

land ownership, topographic maps, general reference maps, thematic or statistical maps,

those illustrating a particular theme, and so on. It is preferable to now think of maps along

different dimensions. A map can be permanent and hardcopy, such as on paper, or

„virtual‟, existing in digital or cognitive (mental map) form. Maps can be visible; they can

be seen, or „invisible‟ - stored in a computer database. Maps can be readily manipulated

between these forms; paper (permanent: visible and tangible); on a computer screen

(virtual: visible but not tangible); stored on a disk (virtual: invisible but tangible);

accessible over a network from a database, such as the world wide web (virtual: invisible

and intangible). Maps now have the capacity for additional functionalities, they can be

dynamic, animated in real time; designed with new variables such as sound; interactive,

containing hyperlinks to connect with additional information within the related database,

thus offering sources well beyond their visible content. Maps help users navigate through

geospace, via associated networklinked databases of geospatially-related information.

Maps can be used as single virtual images or collections of such images accessible on CDs

or over a network; part of an interactive system in which the user/decision-maker is able to

select and interact with previously assembled maps; to access databases (via an interface

map) in order to search and customise what is needed. This facilitates a novel dynamic two

way process of interacting with spatial information

Cartographic Transformations

These map types have been develeloped due to recent transformations in cartography. Since

the 1960s cartography has become increasingly computer assisted, (i) with the

development of software and hardware to facilitate map production, (ii) the flexibility and

user friendliness of the graphical user interface and widespread development of desktop

publishing software, (iii) the rise of the use of geographic information systems (GIS) has

led to a renewed interest in cartography, and the power of maps as the critical endpoint in

the public display of complex and systematic geographic analysis. A GIS is a specialist

information system that processes geographic/geospatial information combining software,

hardware, data, data transfer systems, procedures and human beings, facilitating the

analysis and display of geographic and related information. The advent of the internet and

in particular the world wide web has led to a profileration of maps and mapping services.

This has increaseed the amount of geo-spatial information avaible to non experts and the

authoring of maps by many non traditional cartographers. Parallel to this new issues around

ownership, access and the security of information have developed. Further insights in

cartographic products have been gained through cartographic visualisation. Here a

generalised, symbolised and measurable visual image is explored in a cartographic manner

to reveal previously unknown relationships or patterns within the data. Thus an animated

interactive digital terrain model is a form of cartographic visualisation. With recent technological

devolopments in positioning systems, and mobile computing, a new realm of cartography is

emerging; portable digital mapping delivered to personal data assistants or mobile telephones with

personalised content and geographically contextual relevant information.

Cartography is now used a range of scales from displaying the minute, DNA in medical imaging, to

the vast, cartographic displays of inter-stella systems

Cartographic Research Areas

The technical advances of cartography have been paralled by a series of major questions

about the discipline. A detailed exposure of the power of maps as used for colonial,

navigation, war, propaganda, ownership, territorial agendas and their role in framing and

shaping the power and knowledge that have led to understanding of geographies of the

modern world. That is, traditional mapping of peoples, themes and natural world, but also

that have shaped social and moral spaces. Cartography is a complex culturally embedded

process, situated within its own contexts. Maps can be viewed as products of their authors a

deconstructed as literature would be, subject to a post modern critique, exploring the

rhetorical power and cultural relations of maps, diagrams, and other graphical

representations.

There has been a rise of technical and computational approaches that have lead to an

increase in analytical tools, symbolic codes, comprehension of data values, spatial patterns,

and geographic relationships, derived from developments in computer science and other

disciplines. At the same time cartography has been challenged as an objective rational

science –its ability to create an accurate, objective scaled represenation of reality due to

inherent problems with representation, those of cartographic generalisation, selection,

classification, with the need to suppress, smooth, and displace features. These problems

have been known for a long time, but have been explored more systematically in a technical

manner attempting to quantify uncertainty and imprecision.

The creativity of the artistic process involved in cartography has been acknowledged.

Art is most apparent by the use emotive symbols, the choice of colors for interpretation,

graphical representation and the use of decoration, and hence maps being prized as works

of art, and secondly, an awareness of the role of the imagination and artistic processes

involved during the classic cartographic methodological problems of framing selection,

classification and composition.

Cartography is a vibrant field, combing research and ideas from many diciplines and

relevant to social and scientific inquiry. Cartography‟s broad reach and impact upon our

lives continues to evolve with new developments in visualisation, new areas of the web,

cybercartography, and develops taking cartography into areas of augmented and virtual

reality.

Suggested reading:

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