Cartography Communication in Digital Environment

Li Weisheng
Dept. of Computer Science
Wuhan Technical University of Surveying and Mapping
39 Luoyu Road, Wuhan
P. R. China

The concept of cartography Communication theory was accepted as the key theoretical element in cartography in 1960s and i970s. But the interest in it has declined with the developing of automated mapping and GIS. It seems there is a big gap between electronic technology and formalistic cartography. The discussion of this paper will reveal the connection between automated cartography and communication theory, under the guidance of which, the author has established a object-oriented map generalisation system model.

The following 4 points were discussed:

The Elementary Difference Between Humans and Computers in the Cartography Process.When manually process a map, the eyes, hands, and the brain are synchronised. This is not widely noticed so that though the map making process actually a process of putting the raw information into maps with the feedback from map reading (analysing), but this feedback is neglected in the traditional theory. Normally used computers are sequential machines, and the processes of map drawing and the map reading (analysing) can not be merged. They all are set in the process series. So the communication way in manual process is totally different from that in digital process. There is a necessary to build a map communication for digital mapping.

Digital Map. As a graphical representation of space and spatial relationships, the essence of digital map has not changed. But some elements do change however, and the information and methods involved in map representation can have many new characteristics and the way for map reading is also changed. It is an important factor for the computer's understanding digital maps.

Digital Cartography Communication. The synchronised actions of eyes, hands, and the brain, which are merged together in traditional cartography communication theory are all lined up as a sequential process to fit the digital way. The emphasis is put on the feedback in map making.

Digital Cartography Communication Model. A model for digital cartography communication is proposed. The concept of map was separated into several parts: 1) map graphics which is a picture shown in any media providing for the human visual thinking; 2) graphical map model which is the code for a graphical structure describing the geometry and drawing attributes of map symbols (e.g. for a line, its coordinates, colour, width...); 3)logical element map which represents the logic aspect of a map and the nature of map objects (e.g. for a railway, its coordinates, length, start station, end station...). The connections between the different parts of a map are existed. With this separated concepts, the sequential processing is easy to organise.