Learning Cartographic Communication for Digital Humanities

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Abstract:

From spatial humanities research, we see how cartography can improve digital humanities (dh) map creation and use – both for analysis and presentation (Knowles, 2008). A map in the digital humanities (dh) is a key means for learning but often simplified to an iconic image that fails to account for syntactic and semantic dimensions of cartography. Taking concepts of cartographic communications and cartographic generalisation (selection, distortion, etc) we show in this paper ways to improve dh analytical map use.

We start by considering cartographic communication in more detail with a focus on viewers/readers instead of creators. Traditional concepts of cartographic maps are connected to language theories - semiotics in particular (Saussure et al. 2011, Bertin 1967). Accordingly the map can be understood as a system of signs and ideograms, where it is possible to provide analysis between objects and support discovery and understanding. From this understanding of semiotics consisting of syntactics, semantics and pragmatics we can 'decompose' the map's graphic communication into relationships/dependencies (Freitag 2000) that are central to learning–a continual process. Scale is one of the most important aspects of cartographic communication in dh. Considering generalisation offers a way to develop dh cartographic approaches that support viewer/reader learning and the development of multiple perspectives through syntactical and semantical operations.

Starting with syntactic dependencies, these include rules concerning the composition of the map, what elements it should consist of, and what elements appear on the map that provide agreement with cultural concepts and more specific conventions. Related semantic dependencies describe how creators and readers/viewers learn how to associate signs on the map with other knowledge, in the process developing new knowledge and relating this to experiences. Other map elements play important roles. The map legend helps navigate the complex semiotic associations created by combinations of spatially organised graphic symbols. A neatline separates the graphics of the map as a representation from other immediate experiences of the world. In a learning approach, a dh usage involves developing more and better understanding of these relationships. Pragmatically learning is always occurring.

A pragmatic approach to map use places the user at the centre and focuses on relationships among a map and its users. This is based on four orientations: epistemological (the development of understanding and transmission of information), practical (as a basis to make decisions), scientific (related to the development of improved geographical understanding) and didactic (as support for developing analysis and communication approaches) (Ratajski and Lipiński 1973), (Saliszczew 1973). Learning is the process of developing all of these. When cartographers publish maps, they often consider users' epistemology, practical interests, scientific background and perspectives and didactic orientation. Map makers present the content on the map in such a way as not to only produce an increase of portrayed information; they also must avoid elements that are not relevant to a given presentation (Moles 1957, Meynen 1959), for example, mentions the principle of simplicity (using graphical forms as sparingly as possible) and clarity/transparency in map preparation. Generalisation operations involve syntactical and semantic transformations to create and reconfigure graphical variables to support cartographic communication as a process of learning, e.g, understanding the symbol for church in a small scale map is the same church on the crest of the old city's hill that is shown on a large scale map as an ornate outline of the structure.

Scale is a function in the creation and use of maps that exemplifies how syntax and semantics can be changed. In dh research the map provides an important form of support for knowledge generation and assessment, providing visualisation, references, and as part of geographical framework (Iosifescu-Enescu and Hurni 2007). Communication of the 'uncertainty' arising in generalisation and its relationship to scale aid dh research in extending source criticism to account for cartographic communication. In the paper we discuss preliminary research exploring how scale and

generalisation operators are understood in a dh learning process. For example, other functions of generalisation (selection, classification, simplification), which stand out, have different impacts on the assessment of map reliability and relevance to historical analysis that often have to be learnt.

This contribution focuses on supporting dh learning. Obviously the learning process is a two-way street and we close with some consideration of how cartographers can learn from dh. To go beyond the map as image in dh, this contribution shows the relevance of scale and generalisation in coming to better critical understandings of cartographic communication.

References

Bertin, J., 1967. Sémiologie graphique: Les diagrammes, les réseaux, les cartes. Paris: Mouton.

Freitag, U., 2000. Die Entwicklung Der Theorie Der Kartographie. *Theorie*, 4–14.

Iosifescu-Enescu, I. and Hurni, L., 2007. "Towards Cartographic Ontologies or How Computers Learn Cartography." In: *Proceedings 23rd International Cartographic Conference*, 1.5.3, pp. 4–10. Moscow.

Knowles, A., 2008. Placing history: how maps, spatial data, and GIS are changing historical scholarship. ESRI Press.

Meynen, E., 1959. Einheit von Inhalt Und Form Der Thematischen Karte. *Geographisches Taschenbuch*, 1958/1959, pp. 534–40.

Moles, A. A., 1957. Théorie de l'information et Perception Esthétique. *Revue Philosophique de La France et de l'Étranger*, 147, pp. 233–42.

Ratajski, L. and Lipiński, M., 1973. Metodyka Kartografii Społeczno-Gospodarczej" [Eng: Methodology of Socio-Economic Cartography]. Warsaw, Poland: Państwowe Przedsiębiorstwo Wydawnictw Kartograficznych.

Saliszczew, K., 1973. Wykorzystanie Map Geograficznych Jako Narzędzie Badań [Eng: The Use of Geographical Maps as a Research Tool]. *Przegląd Zagranicznej Literatury Geograficznej*, 3/4: 10–38.

Saussure, F., Baskin, W., Meisel, P. and Saussy, H., 1916/2011. Course in General Linguistics. New York: Columbia University Press.