

essay

That Interactive Thing You Do

The incorporation of interaction in the display of maps may be viewed as a major accomplishment of the computer-era in cartography. Certainly, interaction has pervaded all forms of mapping, whether it is with a database of a geographic information system, a multimedia atlas on a CD-ROM, or street maps on the World Wide Web. A characteristic shared by all of these forms of mapping is the control that the user has over the resultant map.

However, interactivity is not new in cartography. In fact, it may be as old as cartography itself. While we don't know when the first map was made, it was very likely a product of an interaction between two individuals. It may have been much like the "paper-napkin map" of today – the kind of map that is drawn on any piece of scrap paper when words fail as one tries to explain where something is located. A common characteristic of these maps is that the person for whom the map is being made will ask questions that affect how the map is drawn. For example, the person might ask where a particular landmark is located to provide a point of reference. The map becomes a product of interaction when the maker of the map includes the landmark. It is likely that the first map was a product of this type of interaction.

If the first maps were interactive, what does this mean about cartography now? One way to answer this is to view the progression of cartography in three stages. The initial maps were interactive, perhaps drawn in sand with a stick. A major shift occurred long ago as a more stable medium was used and maps were transformed into static objects, first on clay and later on paper. This was an important transition because it made the communication of spatial information possible without the mapmaker having to be present. However, it removed the interactive component. With the help of GIS, multimedia and the web, cartography, now in its third stage, is becoming interactive again.

The first and third stages are both interactive, but differ in how the interaction is achieved – human vs. computer. What do we call the intervening period? In geology, the time period in which we live is commonly referred to as an "interglacial," i.e., the time between major glacial events. In a similar sense, cartography may be seen as having been in an "interinteractive" period – a period when static maps were the norm. The ice is still melting from this period.

The transition to interactive maps is a difficult one for those accustomed to static representations. A "paper-thinking" envelopes us. It is a type of thinking that is difficult to overcome because we have been influenced by static maps for such a long period. It is the way we think maps should be. It is the way we have come to know the world.

We should remember that while we have adapted to static maps, many people have not. A large percentage of the population cannot effectively use these maps. They apparently do not find that the information is presented in a usable form. The one million daily hits on interactive mapping services like MapQuest are an indication that interactive maps are much more accessible to many people. While we might criticize the poor graphic quality of these maps, people seem to use them.

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How can interactive maps be made better? A conversation is a good metaphor to use in understanding what interaction means with a map. An important aspect of a good conversation is that each participant responds in some way to what the other has said. A bad conversation is characterized by no response, a response that has nothing to do with the topic of the conversation, or does not relate to the previous point that was made.

An additional and important aspect of a conversation is that each participant is building up a database of what the other has said. The database can be fairly sophisticated at times. For example, I can remember stories that people have told me several years ago (although they have sometimes forgotten that they have already told me these stories - a flaw in their 'who-have-I-told-this-to' database). We have not reached this stage of sophistication in interactive cartography. The system rarely remembers what it has already shown. (The closest we get to this is the short-term caching structure of a World Wide Web browser.)

Viewed in the perspective of a conversation, the type of interaction that we have with maps on the computer is simplistic. It is somewhat like talking to a person for the first time over and over again. There is no database of the interaction. The computer doesn't remember anything. Because it doesn't remember, it cannot raise the sophistication of the interaction.

Perhaps the conversational form of interaction with maps is not we want. Imagine if the computer responded with messages like:

- I've made this map for you before!
- Don't you remember where that feature is located!
- Can we move to a more intelligent level of interaction, please?

We apparently prefer a more shallow form of interaction with the computer. Perhaps we want to maintain the status of a master. We certainly don't want the computer to challenge us as another person might do.

Some computer games incorporate varying levels of sophistication. They adapt to a particular user and move them forward to more complicated tasks with rewards along the way. This, and the very high level of interaction that characterizes these games, maintain the interest of the user. The user is made to feel part of the game. The interactive map can create the same feeling on the part of the user.

How far we have come from that first interactive map? It might be said that with all of our computers and technology, we still cannot simulate the interaction in a "paper-*napkin*" map. We may be making more accurate maps and maps that are the result of greater analytical thought, but they may not be as interactive as that first map in the sand.

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