About V2_ Knowledgebase Visualization

Social scientists have recognized that we are living through an age which "the generation of wealth, the exercise of power, and the creation of cultural codes has come to depend on the technological capacity of societies and individuals, with information technologies as the core of this capacity". Information and communication technologies are increasingly linking into everyday life processes. More and more of the elements that define us as humans are being mediated and inserted by structures that generate, codify and preserve data.

In 2007, humanity was able to store 2.9×10^{20} optimally compressed bytes[1], communicate almost 2×10^{21} bytes[2], and carry out 6.4×10^{18} instructions per second on general-purpose computers [3]. And general-purpose computing capacity was growing at an annual rate of 58%. Meanwhile, the world's capacity for bidirectional telecommunication was growing at 28% per year, closely followed by the annual rate of increase in globally stored information (23%).

The generation of endless masses of data has become one of the primary scientific, economic and social activities in contemporary society. Data-driven concept takes into account how much a discipline changes when techniques of data gathering, analysis and representation are introduced into it. As a result of the capacity for and inevitability of data generation, data-driven is a transformative agent in new scientific methodologies and working processes and a key tool for different agents in society.

Yet it seems that our capacity for generating data has far exceeded our ability to comprehend it. Human cognitive capacity has not expanded to match the exponential increase in information to be interpreted . Attempting to understand all the information we generate is no longer possible with traditional graph techniques.

For this reason, a new field is emerging. Data visualization (also known as datavis and infovis) looks for new representation strategies and new ways of understanding and explaining information. It is an interdisciplinary practice that uses the great power of visual communication and the full range of our cognitive capacities – the vast bandwidth of our eyes – to comprehensively explain the relationships of significance, cause and dependence created by vast masses of information generated through scientific and social processes.

Nineteenth-century graph techniques, such as bar charts, pie charts, scatter plots and line charts, used a particular visual language, which included points, lines, curves, simple shapes and other primitive graphics, to depict quantified data by systematically mapping it in visual images. From our perspective, this particular way of explaining phenomena now fits within a scientific paradigm of reduction (breaking nature down into the simplest possible elements and defining rules for how they interact). Over the past 20 years, the way we look at nature has shifted with a need to understand phenomena of complexity (e.g., chaos theory, emergence and complexity theory), and this change is reflected in the kinds of visualization we find appealing: for example, networklike structures.

Nowadays, generating, classifying and tagging data with social technologies and Web 2.0 applications is becoming a social activity, something everyone does. This means much more data is being generated and gathered, practically in real time. We need systems capable of dynamically representing it.

Rather than identifying visualization culture as a single category, let us consider it as existing in a space defined by three vertex.

Information visualization is mainly a tool for understanding data, i.e., discovering patterns, connections and structures. If science is the area of human activity that targets the discovery of new knowledge about the world through systematic methods – such as experimentation, mathematical modeling and simulation – then visualization is one of these methods.

But it is also part of design, since it involves the visual presentation of data in a way that facilitates the perception of patterns. Just as a graphic designer organizes information on a poster or web page in such a way as to help the user navigate its layout efficiently, an infovis designer organizes data to help the user see patterns. At the same time, like graphic designers, infovis designers aim for more than just efficiency and clarity. They choose particular visualization techniques and graphic styles to communicate ideas about the data and evoke particular emotions in the viewer.

Some infovis projects can also be considered as art, products without utilitarian activity as opposed to utilitarian designs. The intention behind these projects is not to show patterns or structures in data sets but to use infovis as a technique for producing something aesthetically interesting.

In conclusion, the aesthetic and technical strategies of infovis are coming from a wider and wider ambit. After beginning as a technique of scientific exploration and moving into social and artistic domains, it has finally emerged as a medium in its own right, with a broad range of expressive potential.

The project we are presenting is an attempt to bring all these theoretical background ideas into play within the context of some of the information generated within the V2_ Institute.

[1] Storage is defined as the maintenance of information over a considerable amount of time for an explicit later retrieval and is estimated as the installed (available) capacity

[2] Defined as the amount of information that is effectively received or sent by the user while being transmitted over a considerable distance (outside the local area).

[3] Computation is defined as the meaningful transformation of information and is estimated as the installed (available) capacity.