Information Visualization

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INTRODUCTION

Information visualization refers to technologies that support visualization and help in the interpretation of information. These technologies include digital images, graphical user interfaces, animations, three dimensional presentations, geographic information systems, virtual reality, and of course, tables and graphs. All of these visualization techniques might be used in enterprise portals where the portal user often handles large amounts of data of different types, from many different sources, and utilizes various software tools. Information visualization helps enterprise portal users understand and interpret complex information, and most importantly, helps identify relationships. That is, information visualization allows portal users to study information in a new way which can lead to novel insights.

BACKGROUND

Because the human eye is the most powerful pattern recognition tool, visual presentation of information allows portals users to see patterns they would not have noticed otherwise. An example of an enterprise portal screen that includes information visualization that can be used efficiently by the user of this portal is shown in the Figure 1. Complex information on the sales at four branches of this insurer is rendered as a circle that can be presented in three dimensions and animated, with details available at a click of a mouse. The map of the territory is an intelligent map with complex geographic information captured through the real-time GIS application. Using such a portal, a sales manager, for example, can more efficiently direct resources to the most effective sales channels, spending less time analysing sales data, and having that much more time to devote to the other aspects of the business.

Information visualization has entered the public sector portals as well. For example, the U.S. Agriculture Department's National Agricultural Statistics Service (NASS) portal in not so distant past provided information on agricultural trends in hundreds of pages of statistical tables and charts, most of which had to be downloaded and viewed separately. The serious problem of such inefficient data dissemination needed to be addressed. That is why portions of the NASS portal were redesigned with the help of information visualization software from Inxight Software, Inc. (www.inxight.com/). One new chart, for instance, allows the portal user to quickly see how all 50 states rank in acreage of harvested cropland, and how they rank in several different crops, including soybeans, corn, wheat, and tobacco (www.nass.usda.gov/research/). Running the cursor over the bar representing, for example, North Carolina's cotton output, reveals the exact figure. Clicking on a given state makes it easy to read the figures for all of that state's crops. Columns on the chart can be moved around so that, for instance, corn output can be placed next to wheat or hay output, allowing

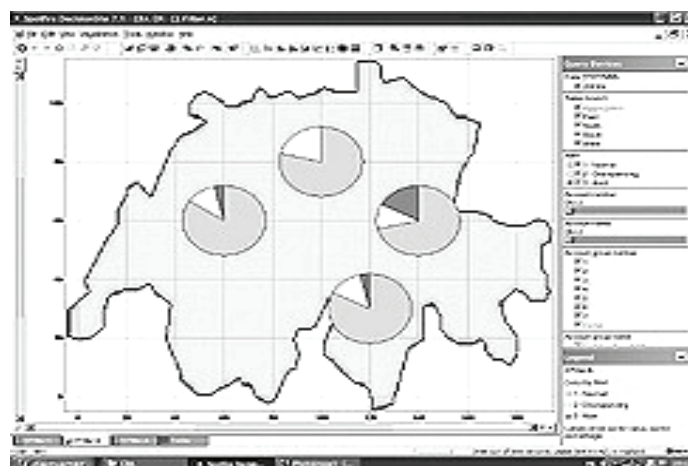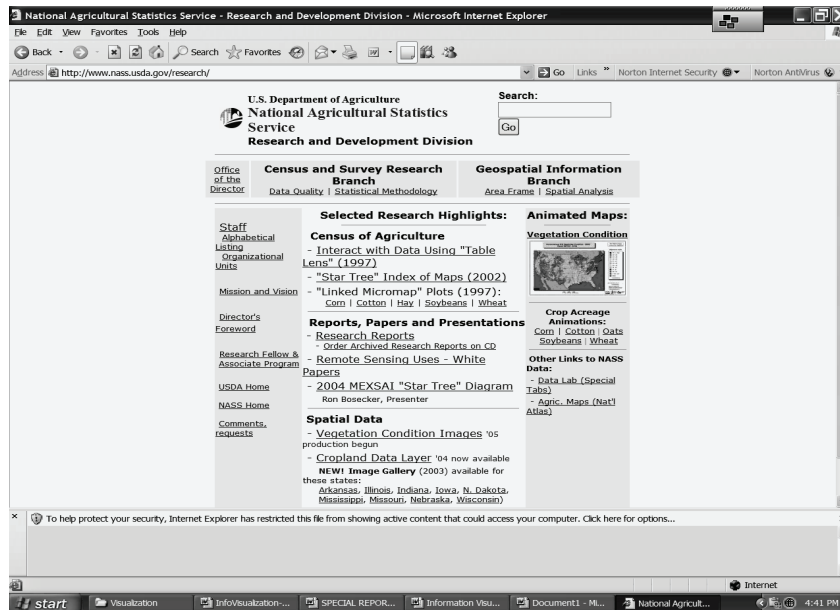*Figure 1. Screen capture of the enterprise portal that uses information visualization*

Figure 2. National agricultural statistics service portal

for easier comparisons. The charts benefit both public users of the portal and NASS employees. The information visualization allows them to get a bigger picture and to see patterns and structure in the data that they will never see otherwise. The screen image of the main NASS portal's page is shown in the Figure 2.

SPECIFIC EXAMPLES OF VISUALIZATION TECHNOLOGIES

Digital Images

A very interesting example of digital images are ispots, the intensity maps depicting in real-time the use and location of the wireless devices on the campus of the Massachusetts Institute of Technology (http://senseable.mit.edu/projects/ispots/ispots.htm). What is most intriguing is the possibility of analysing the specific spatial qualities of ispots in order, for example, to understand what makes one location on the campus more popular than another and why certain locations are seldom used. Such use of digital images seeks to introduce a new real-time feedback planning strategy, a strategy that can be very valuable to the managers using portals.

Figure 3. An example of visualization of information—intensity map showing the use of the wireless access points on the MIT campus
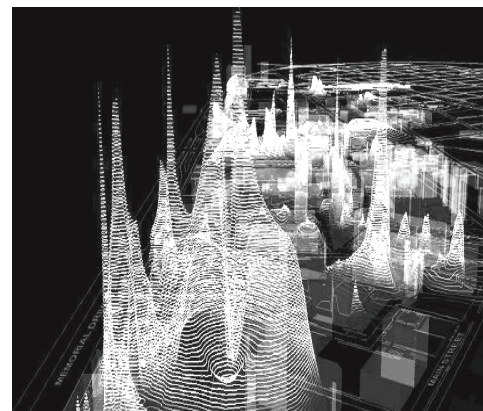

Figure 4. An example of visualization of information—digital image of the wireless access points on the MIT campus

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