Putting Cancer Data on the Map

Background:

The National Cancer Institute (NCI) is the Federal Government's principal agency for cancer research and training. The NCI is a component of the National Institutes of Health, which is a part of the Department of Health and Human Services.

The NCI coordinates the National Cancer Program, which conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.

Challenge: Delivering Cancer Mortality Rates Efficiently and Effectively

The NCI is waging a battle against one of the toughest killers of our time, cancer. Part of the mission of the NCI is to disseminate information in a clear, concise manner that helps inform and educate those concerned with this dreaded disease.

The NCI has built a massive data repository regarding cancer occurrences and cancer mortality rates. A few years ago, the NCI tied their mortality database to a program called PopChart from Corda Technologies to display the information in the form of charts and graphs. In addition to the PopChart graphing system, the NCI wanted a way to extend their presentation of this data in the form of a geographic display or an interactive, dynamic online map.

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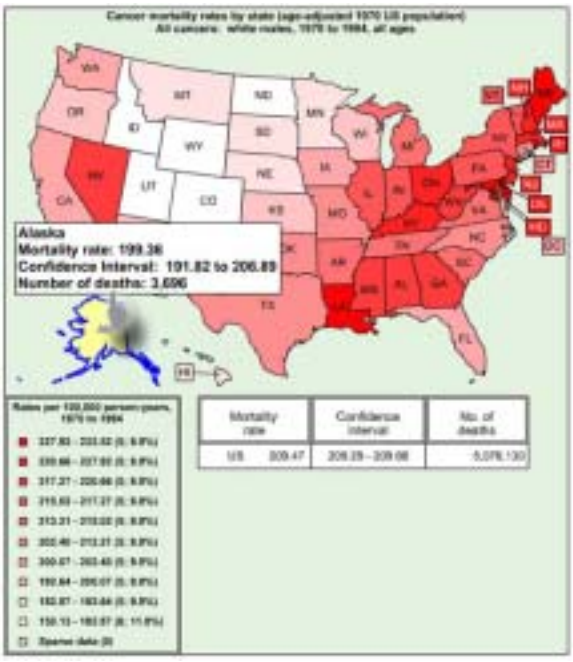
Finding a Fast and Flexible Solution

Initially, the NCI decided to go with a Geographic Information System (GIS), which was the best available technology that would fit their needs at the time. GIS programs deal with spatial information. They are usually characterized by the ability to link attributes and characteristics of an area to its geographic location. They can be used in a variety of applications, including exploration, demographics, dispatching, tracking and map making.



GIS can be highly effective when used for certain applications, but for the NCI, this type of system was simply too big and slow for this particular task. A telling experience came when Yahoo! posted a story with a link to the NCI's cancer mortality maps and graphs page. As thousands of people tried to access the maps, the GIS mapping system crashed almost immediately. However, the charting and graphing side of the site, which is powered by PopChart, was able to take the load quite easily and serve up chart and graph requests without breaking a sweat.

The NCI still wanted to use mapping software to display geographic patterns and time trends of cancer death rates, but they realized that they needed to change their approach, so they came to Corda and asked about its OptiMap.

OptiMap is a server-based online mapping software that runs on the same underlying (Java-based) technology as PopChart. It suited the needs of NCI much better than a GIS system ever would. Why? Primarily because it is very fast, very flexible and it can handle a myriad of requests for maps populated with data that are pulled instantly off the NCI's databases.

Using OptiMap, NCI can display customized maps that help educate people on cancer mortality rates. Visitors to this public site can choose to view the data by such variables as gender, age group, and types of cancer. The Web site lists 40 different cancers for all 50 states and their 3000+ counties. OptiMap provides users the ability to drill

down into the maps. They can start at a high view of the entire US, then go down to a state level and view the cancer mortality rates by county or state economic area. With the data portrayed geographically for visitors, it becomes possible to visualize connections that they might not have seen by just looking at alphanumeric data. The NCI's cancer mortality maps can be found at ww.cancer.gov and www3.cancer.gov/atlasplus/.

Meeting the Needs of the Visually Impaired

In 1998, Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities. Under Section 508 (29 U.S.C. 794d), agencies must give disabled employees and members of the public access to information that is comparable to the access available to those without disabilities. Since so much public information is available on the NCI web site, it too must provide information that is accessible to the visually-impaired, among others.

GIS vendors had informed the NCI that it was impossible to make their maps 508-compliant. First of all, maps are an inherently visual medium and GIS programs primarily use photographs or other fixed images to display information. The challenge is to make the data contained in maps accessible to the visually impaired in a usable and informative manner.

A visually impaired person who wishes to access information from the Internet uses a screen reader that reads out loud the text on the screen. When it comes to an image, such as a photograph, the screen reader simply states that it has come across an image—if the photograph has a caption that describes the content of the photo, the screen reader would read that.

The problem the NCI faced was that they had dozens of variables that would display literally millions of different maps. It would have been impossible for the NCI's Web developers to manually input captions describing each of the custom maps.

Corda's OptiMap has the power and ability to create a textual description of each variable on every map that it outputs—instantly and automatically. This description is accessible to the visually impaired through a [D] link (descriptive link) which the screen reader recognizes and announces the link to the user. The link can then be accessed and the full descriptive text read by the screen reader. This method provides the visually impaired the greatest access to information in an online, interactive map.

Creating Custom Maps on the Fly

One of the primary reasons the NCI wanted to create this informative Web site was to quickly and easily answer questions about cancer mortality in the United States. OptiMap from Corda Technologies does this by providing custom maps based on user-controlled parameters. People from all walks of life including private citizens, special interest groups, students, researchers, health care professionals, legislators, and others, including the visually-impaired, now have the ability to quickly access and benefit from this important information.

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