



IT-Professionals » English News » Internet » WORLDBEAT - Wikis, the Semantic Web head to the streets

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While drivers are accustomed to using traffic reports to assess road conditions, pedestrians who navigate cities are typically left without aid to determine the best route. But researchers at the Massachusetts Institute of Technology using wikis and the Semantic Web look to change the way people map and navigate their cities.

The Wiki City project, run by MIT's , aims to apply wiki technology to the map-making process. The project's ultimate product will permit anyone to upload content to a map and utilize Semantic Web principles to cross search multiple layers of information.

, an early incarnation of the project's user-generated maps, used GPS (Global Positioning System) and cell-phone data to produce a real-time map during an all-night festival held in the city on Sept. 8. A Web site featuring a satellite image of Rome displayed event locations and the position of buses and pedestrian traffic in real time. Buses equipped with GPS devices fed their locations to the project every minute while cell-phone data was constantly received to show how crowds were moving around the city. An image of the map was also projected in one of Rome's main squares.

"If people know about the state of their environment in real time (as opposed to a static map), they can make better informed decisions about how to move about in the city which in term increases efficiency," Kristian Kloeckl, one of Wiki City Rome's team leaders, wrote in an e-mail interview.

Wiki City Rome served as an initial step in the Wiki City project. Future projects involve introducing the wiki city concept to other cities that have partnered with the SENSEable City Laboratory. The list currently includes only European cities because their public transportation networks and outdoor spaces correspond with the project's aim of studying how people react and move about in public spaces, Kloeckl said. But the project is applicable to non-European cities, he said. He mentioned that a Boston area furniture company is interested in placing displays in their products that would show a wiki city map.

Wiki City reseachers ultimately want to introduce full wiki concepts to the project and allow any person or business to upload information to a map, Kloeckl said. The wiki method of permitting anyone to add any information lends itself to fraudsters. One possible resolution involves introducing a ranking system similar to the one eBay Inc. uses with sellers.

"Users supply the rankings. The system is completely independent. People gradually acquire reliability. This approach would be the most coherent for this type of structure," Kloeckl said in a telephone interview.

Wiki City wants to combine different levels of data that, when searched, provide an answer incorporating each level of data. In Kloeckl's vision of a person using a full-featured wiki city map, a runner would use the map to search for a jogging course based on a city's traffic and air quality as well as the runner's health.

"Now making these layers intersect in a meaningful way should give you a proposal

of a jogging path that corresponds to your combined query," Kloeckl wrote.

Kloeckl also provided another example in which a person would use a map to locate a store with a specific bottle of wine and plot a course from the store to a friend's home.

Some challenges remain before a real-time map helps people navigate their cities.

While obvious devices to display a wiki city map include cell phones, PDAs (personal digital assistants) and smartphones, Kloeckl also wants more utilitarian structures, such as bus stops, to offer access to the maps.

"Everyone is familiar with a bus stop," he said. "So it's using the data with objects people are familiar with."

User interface issues also require additional thought, Kloeckl said. While users need to access the information with ease, uploading that data to the wiki also requires a simple method, Kloeckl said. He noted that the upload system must require little time and effort since some of the content will come from people who are moving around a city.

Finally, the data layers need to be arranged in such a way that a search produces pertinent results. Solving this problem involves further developments in the Semantic Web, an evolving component of the Web being developed by the Worldwide Web Consortium. The Semantic Web aims to take data and apply standards that allow computers to play a greater role in locating, finding and presenting information. This will permit computers to understand the standards and produce more contextual search results.

"We need information that is time and place relevant so it can be queried on a semantic structure," Kloeckl said. "We need a way to structure data so it can be cross queried."

Pedestrians may eventually turn to interactive maps to avoid the masses or catch a bus, at the same time that their movements become part of the map's display.
