WikiCity
Real-time location-sensitive tools for the city

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In the past decades, real time control systems have been developed in a variety of engineering applications. In so doing, they have dramatically increased the efficiency of systems through energy savings, regulation of the dynamics, increased robustness and disturbance tolerance.

Now: can you have a city that performs as a real time control system? This is the aim of the WikiCity project at MIT.

Let's examine the four key components of a real time control system:

1. entity to be controlled in an environment characterized by uncertainty;
2. sensors able to acquire information about the entity's state in real-time;
3. intelligence capable of evaluating system performance against desired outcomes;
4. physical actuators able to act upon the system to realize the control strategy.

A city certainly fits the definition of point 1, and point 2 does not seem to pose particular problems. As an example, the RealTimeRome project (senseable.mit.edu/realtimerome) used cellphones and GPS devices to collect the movement patterns of people and transportation systems, and their spatial and social usage of streets and neighborhoods.

But how to actuate the city? Although the city already contains several classes of actuators such as traffic lights and remotely updated street signage, a much more flexible actuator would be the city's own inhabitants.

Consequently, we are creating a new platform for storing and exchanging data which are location and time-sensitive, making them accessible to users through mobile devices, web interfaces and physical interface objects (Fig. 1). This platform (Fig. 2) enables people to become distributed intelligent actuators, which pursue their individual interests in cooperation and competition with others, and thus become prime actors themselves in improving the efficiency of urban systems.
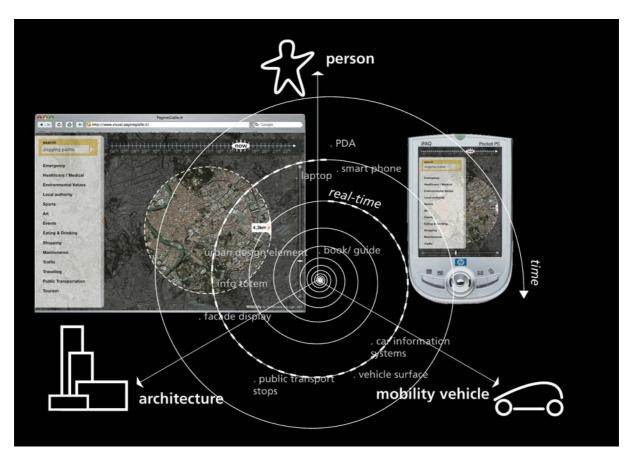
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Figure 1. Device Interface study. WikiCity explores different interface modalities that create connections between the virtual data and the actual physical world where these data is accessed by users. Interfaces to WikiCity can be more closely positioned to the built environment, to moving vehicles or to the user. Functional elements of the 2D display interface include: search field, "local" distance range indicator, time range indicator and a results area.
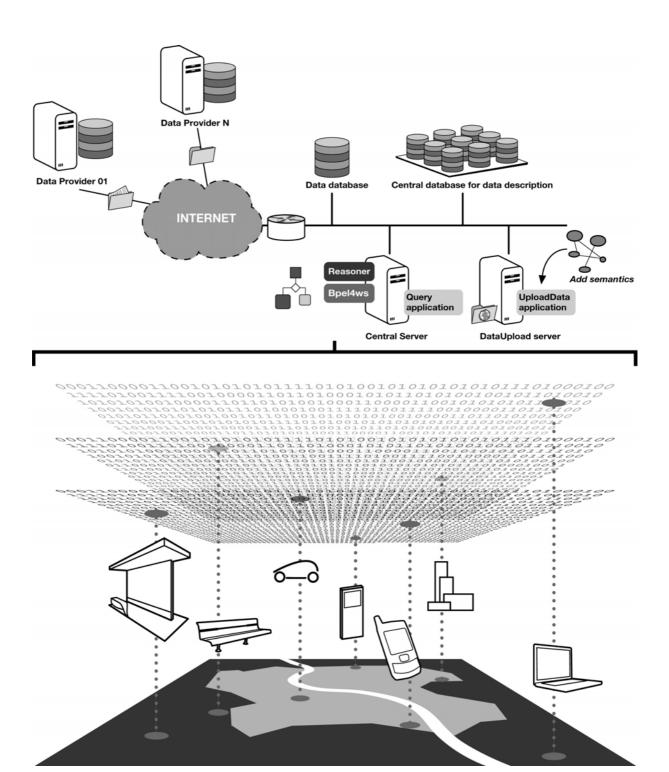
Figure 2. The system is based on a common, semantically defined, format for interchange of locational data and a distributed platform able to collect and manage such data in real time. The latest W3C trends: Semantic Web and Web Services Composition, provide the basis for developing and maintaining such platform.