

SMART CITIES AND SPACES: SENSE-ABLE PLANNING

when everything is
programmable:
LIFE IN A COMPUTATIONAL AGE

Over the next decade, mobile devices and ubiquitous connectivity, the sensory and servo web, and situated software will become tools for programming the social activity of urban places. Beyond just inciting flash mobs, programmable peer networks will let us tell each other precisely where to go, what to do, and how to do it. The aggregation of sensory data will also allow top-down social programming of the cityscape on a scale and at a level of detail never imagined even by George Orwell. The same platforms that allow us to design activities for our cliques and neighborhoods will also allow planners to program us.

CITIES AS SOCIAL INFORMATION SYSTEMS

Throughout history, cities have been sites for social “programming.” The earliest cities were centers of religious and governmental power. These early institutions harnessed the social “code” of their day—laws, ledgers, and sacred texts—to exert influence and control over populations. In the industrial age, technologies such as radio and television were exploited to conduct mass-scale social programming. Over the next decade cities will enter a new age of experimentation and innovation around tools for social programming, as urban dwellers pioneer new ways of exerting social influence across these platforms. This period of innovation will be characterized by a tense interplay between bottom-up and top-down applications of context-aware technologies for social programming.

PEER PROGRAMMING

In recent years, mass-market social sites have become platforms for highly decentralized, network-focused social communication. But a growing sector of innovation on the Web will consist of what Clay Shirky called “situated software ... software designed in and for a particular social situation or context.”¹ As the cost and time involved in creating new, highly specialized social networks and social applications falls, we will see an explosion of DIY social interaction design. This “peer programming” will have a transformative impact on the way social experiences play out in the city and will drive the emergence of new group behaviors.

THE PROGRAMMABLE PANOPTICON

Just as the Web decentralizes and democratizes the tools for building and using social communication in cities, it will give existing institutions near-omniscient powers for social surveillance and programming. Combining rich streams of data from multiple city-scale sensor grids with combinatorial analytics, 21st-century versions of Jeremy Bentham’s Panopticon—a prison design organized around an invisible but all-seeing warden—will give large institutions a new degree of social influence. Today, these weapons of data mining, behavior modeling, and pattern finding are used against terrorists to lay traps. Over the next decade, they will increasingly be used to design “nudges”—policy frameworks that seek to influence small decisions at the consumer or citizen level.



A street light equipped with data sensors



ENABLING TECHNOLOGIES



Simulation:

Modeling possibility space

Pervasive Wireless:

Continuous connection

Location-based Computing:

Everything knows where it is

Cloud Computing:

Supercomputing on demand

Wireless Power:

Always-on mobile devices

Sensors and Sensor Networks:

Everything in its right place

Signals:

FOURSQUARE (PEER PROGRAMMING)



City guides have been peer-produced before, but what happens when you turn the process into a game and boil it down to just the tips and best “to-dos”? Foursquare is a mobile social application that lets players compete by visiting restaurants and bars, and sharing their favorite activities. Users have already repurposed the platform to code suggested sequences: pub crawls, gallery walks, and sightseeing tours. Location-sensed checkpoints help the system verify you’re actually following the “program.”

Source: <http://www.foursquare.com>

NATURAL FUSE (PEER PROGRAMMING)



Pachube, an effort of London-based architect Usman Haque, creates a platform for easily sharing social sensor data. His most recent project, Natural Fuse, suggests what may be possible as we add the capability for social machines to become servos (automatic devices that use feedback to correct the performance of a mechanism), as well as mere sensors. In Natural Fuse, an array of plants is used as a carbon offset for any device that can syndicate its power consumption sensor. If the device exceeds the carbon-mitigating capacity of the plants, a circuit trips and the plants are killed.

Source: <http://www.naturalfuse.org>

CITY DASHBOARDS (THE PROGRAMMABLE PANOPTICON)



Aerial photography revolutionized the perspective of urban planners in the early 20th century, allowing them to see the entire city at once. A similar revolution will unfold as massive sensor grids feed real-time visualizations of urban activity. Today, traffic data are widely sensed by probe vehicles and aggregated by transportation planners to manage congestion by “programming” route recommendations into traffic information services. The next step is using these data to perfect models of urban activity. These models can be used, for example, to program social responses to future epidemics.

Source: <https://www.eeducation.psu.edu/geog588/book/export/html/1407>

What difference does this make?

Social networks integrated with the life of cities enable programming of a dense narrative of connections between digital and physical places and open up new possibilities on a number of fronts.

ABILITY TO PROGRAM SOCIALLY DESIRABLE BEHAVIORS

One of the most exciting opportunities emerging in smart cities is for groups to use social programming to produce positive behaviors. For instance, recent research on social contagion indicates that people tend to quit smoking in groups. Programmable social networks extend the idea of “nudges”—micro-incentives that steer individuals to better decisions—to groups. Can social networks in place help improve group decision making in health, energy, and education?

DESIGN FOR SERENDIPITY

Applications like Foursquare seek to amplify what urban designer Christopher Alexander called the “magic of the city” by creating tools for discovery and chance encounters. The idea that we can design serendipity through the use of social applications will become an important element of environmental design going forward.

THE BODY AS SEARCH ENGINE

Cities have always structured information and social networks spatially; for instance, the Diamond District in New York City is a good place to find knowledge and expertise about gem cutting. Social programming will make clustering knowledge and expertise even more effective by making it transparent and accessible in place. It will make it easier, for example, to find the connections and information you’re looking for at a trade show or business meeting.

PROGRAMMABLE AND MASHABLE INFRASTRUCTURE

Social programming will allow the integration of social experiences with the physical city at multiple scales. As more sensors become syndicated and servos are connected to these streams, infrastructure mashups will layer new programmable connections atop existing grids—pipes between different parts of the physical city similar to the pipes of shared data that crisscross the Web. These programmable grids will allow for greater resilience in times of crisis.



What to do differently?

Organizations can reorient knowledge platforms, make tools for social programming available to innovators, and design systems that provide social programming cues from both peers and managers.

REFERENCE

1. http://www.shirky.com/writings/situated_software.html.

TRANSITION FROM CONTENT- TO PEOPLE-DRIVEN KNOWLEDGE PLATFORMS

It is important to reorient existing platforms to search for experts, not facts, and to create new knowledge platforms that provide opportunities for serendipity. Social networks should not just be about efficient knowledge discovery but should also make it fun and serendipitous.

PROVIDE TOOLS FOR SOCIAL PROGRAMMING EXPERIMENTATION

Many large organizations have platforms that can be used as a sandbox for experimentation in social programming—reward systems and tracking systems. Open these up to innovators in structured ways.

DESIGN SOCIAL NETWORK PLATFORMS FOR MIXED USE

Programmable social networks that bridge top-down and bottom-up approaches will probably be the most successful for larger organizations. Successfully mixing systems that provide cues from both peers and managers will require careful design.



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