

MODEL(ED) INDUSTRIES: PREVIEWS AND RE-DO'S FOR BUSINESS AND ORGANIZATIONS

when everything is
programmable:
LIFE IN A COMPUTATIONAL AGE

In the coming decade, the huge influx of quantitative social data collected through cell phones and sensors will usher in a new era of modeling complex social systems. The ubiquity of sensors and cell phones is creating new data streams—including demographics, location information, and mobility patterns—as individuals intersect with technology through devices and sensors. These new data streams along with advances in modeling of complex networks will provide an integrated framework that will enable modeling of social systems, from industry supply chains to global pandemics to smart cities.

MODELING AT EXTREME SCALES

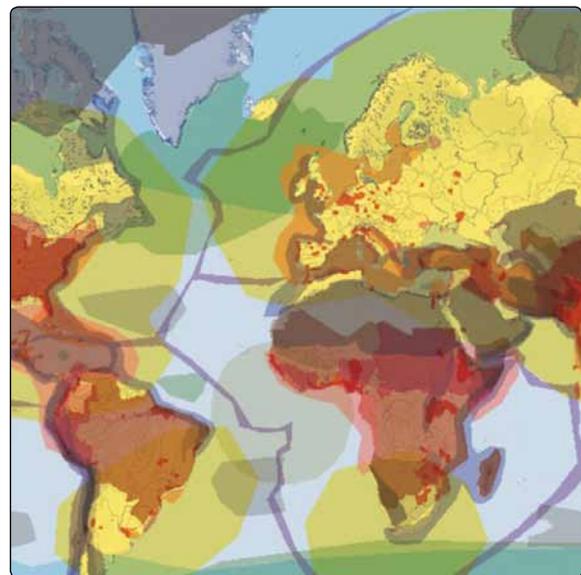
The collection of enormous quantities of social data will enable modeling of social systems at extreme scales, both micro and macro, helping uncover new patterns and relationships that were previously invisible. Agencies will be able to model macro-level phenomena such as global pandemics to stop their spread across the globe, while at a micro level individuals will be able to simulate their route to the office to avoid traffic congestion based on real-time traffic data. Micro- and macro-scale models will mesh to create models that are unprecedented in their complexity and completeness.

GROWTH OF BOTTOM-UP MODELING

Decentralized bottom-up movements that use social data to model cities, environments, social groups, and individual behavior will become more common as the abundance of quantitative social data and easy-to-use modeling and visualization techniques go mainstream. We are already seeing early signs of this in the DIY city movement—which aims to use open and decentralized data, as well as open-source tools to build cities that thrive on a participatory and collaborative citizenry as opposed to the traditional government-controlled and centrally-run cities. With quantitative social data residing in the hands of everyone, there will be grassroots experiments in modeling—such as efforts to model local and even global climates and food webs through data collected by individuals.

MODELING AS A MUST FOR BUSINESS DECISION MAKING

Running a business is becoming a meticulous science utilizing quantifiable information to inform design. Modeling business decisions and processes using quantitative social data will be a key element, and modeling will be considered a requirement for decision making, not a luxury. Organizations will rely on modeling what-if scenarios for everything from everyday decisions to make-or-break choices. Before starting a new business enterprise, it will be possible to model the entire industry to ensure business success. For instance, in the coming decade it will be essential for an airline to model routes based on people's travel patterns before starting operation.



Opensailing.net and 2012hopes.com world map based on areas of conflict and environmental disaster



ENABLING TECHNOLOGIES



Simulation:

Modeling possibility space

Cloud Computing:

Supercomputing on demand

Location-based Computing:

Everything knows where it is

Pervasive Wireless:

Continuous connection

Sensors and Sensor Networks:

Everything in its right place

Wireless Power:

Always-on mobile devices

Signals:

CITY SENSE (MODELING AT EXTREME SCALES)



City Sense is offering heat maps of real-time mobility patterns in cities such as New York and San Francisco. Since it provides users information on where people are, subscribers can use it to figure out what the top nightspots are in real time or where everybody is going next. The service is available for the iPhone and BlackBerry. Services like these help users plan their daily routines by modeling this choice through cell phone data.

Source: <http://www.citysense.com/home.php>

PACHUBE (GROWTH OF BOTTOM-UP MODELING)



Pachube is a Web service that allows users to store, share, and graph data from sensors and devices in buildings, transportation systems, energy grids, and agricultural fields across the world. This is a great tool for decentralized, grassroots efforts to collect and model data in order to encourage behaviors such as sustainable transportation.

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

MACROSENSE (MODELING AS A MUST FOR BUSINESS DECISION MAKING)



MacroSense is a groundbreaking application that enables businesses to get insights into human activities through quantitative social data captured through various devices such as GPS, Wi-Fi positioning, cell tower triangulation, RFID chips, and other sensors. The application can be used to answer questions such as where to open a store based on modeling people's movements within a specific location.

Source: <http://www.sensenetWORKS.com/macrosense.php>

What difference does this make?

Ubiquitous collection of quantitative social data will enable new approaches to research and design while at the same time raising privacy issues and inviting a backlash of tools to disable information gathering.

NEW PRIVACY ISSUES DUE TO AMBIENT DATA

Even though quantitative social data from cell phones and sensors will be collected passively and aggregated for predictive modeling, we can expect people to raise the Orwellian specter of Big Brother watching. This will be further compounded as different data streams will be meshed together to create a fuller picture at different scales.

GROWING MARKET FOR TOOLS TO DISABLE INFORMATION GATHERING

The constant collection of data will create a new market for products and services that help people disable and counter information gathering devices. Just as today, with cameras being commonplace, researchers are working on devices that will blur faces, in the coming years there will be efforts to blur data inputs from cell phones and sensors.

DYNAMIC METHODOLOGY FOR RESEARCH

Most large-scale quantitative social and market studies have heretofore collected data from respondents through surveys and questionnaires, but these instruments raise concerns about the validity and reliability of the data and the truthfulness of the respondents. Collection of social data from sensors and cell phones can provide more reliable and valid findings as well as a platform for the growth of new dynamic research methodology.

NEW APPROACHES TO ENGINEERING AND DESIGN

Analysis of quantitative social data will provide us with a window into dynamic behavior as people interact with physical infrastructure and the built environment. In some cases, this might provide new approaches to the design and management of built spaces. For example, it may be possible to use data to model where people will choose to walk before building a sidewalk around a building.



What to do differently?

The practice of modeling based on quantitative social data will become so deeply embedded and accepted among organizations that no decisions will be made without modeling. Organizations will need to restructure certain processes to accommodate model-based decision-making and design.

REFERENCE

1. http://bobsutton.typepad.com/my_weblog/2009/11/intuition-vs-datadriven-decisionmaking-some-rough-ideas.html

USE SIMULATION FOR COMPETITIVE ANALYSIS

Most organizations mine data that is collected internally for business intelligence. In the coming decade organizations will tap into these new data streams for modeling risks and opportunities.

LET MODELING AND INTUITION CO-EXIST

Organizations will increasingly be drawn toward making decisions that have been tested through modeling rather than based on intuition. Modeling and intuition don't have to be opposing forces. As Stanford professor Bob Sutton points out, modeling and intuition "are not opposing perspectives, but tag partners, where hunches are followed and then evaluated with evidence."¹

HIRE PEOPLE WHO SPEAK THE LANGUAGE OF MODELING

As modeling becomes recognized as a necessary tool, organizations will have to hire people who understand the language of social modeling. Special skills will be required for running what-if scenarios and making decisions based on their results.

CREATE AN OPT-OUT STRATEGY

In a world where all personal devices are a source of data about people's lives, there will be backlash from those who don't wish to be constantly on the radar. To deal with this backlash, organizations should provide opt-out strategies.



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