

EMBEDDED GOVERNANCE: DOWNLOADING LAWS INTO OBJECTS AND THE ENVIRONMENT

when everything is
programmable:
LIFE IN A COMPUTATIONAL AGE

Over the coming decade and beyond, governments will begin to implement automated systems of law and regulation. Leveraging location-based computation, smart identification technologies, and sensor networks, these systems of enforcement will be contained in our official documents and embedded within our devices and throughout our physical environment. Laws, now written on paper and enforced by people, will be carried on software and enforced through electronically updated and immediately downloadable rules woven into the fabric of our environment. Governance will become automatic, and lawbreaking much more difficult.

IDENTIFICATION: FROM POCKET TO NETWORK

Governments, in the name of security and control, will require citizens to register their biometrics and carry machine-readable identification. This identification will be easily read at borders, on highways, and at points of contact with regulations and licensing (such as purchasing firearms). Increasingly, our built environment and machines will communicate with our identification markers, allowing use only when licenses are valid and all legal requirements and authentications are met. Information about citizens will be consolidated and centralized, creating a very rich database. Strict policies on how this information is used, and rigorous oversight of its use, will be necessary to protect citizens from government intrusion and abuse.

TAXES AND TOLLS: FROM INDIRECT TO DIRECT

With the ability to accurately track consumption and use of government services, governments will be able to collect taxes and fees directly and automatically from citizens during their daily lives. Energy, water, and other services are already charged for and taxed based on actual usage data. Taxes for more services will be charged and collected in this way. For example, instead of indirectly taxing road usage and automobile travel through gasoline taxes at the pump, which impact drivers differently depending on their car's gas efficiency, governing bodies will tax actual miles driven on highways and roads.

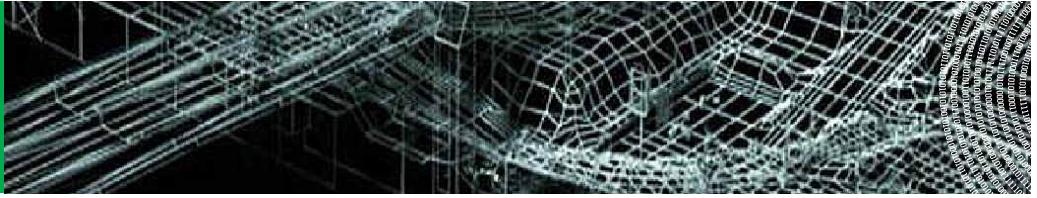
LAW: FROM RIGID TO CONTEXT-AWARE

Currently, most laws are "one size fits all," applying to everyone at all times. Soon, laws will be much more responsive to situation and context through continuous feedback from user information, updated policy, and the environment. Speed limits can be adjusted immediately based on weather and traffic conditions to directly govern the speed of automobiles. Pollution emissions standards can be set relative to environmental conditions. Patients and clients will be able to view real-time updated medical and legal licenses, while doctors and lawyers will be unable to practice without valid licenses. Airplanes, elevators, escalators and all machines and devices will be enabled to function only if and when all safety inspections and licenses have been registered with the network.



A cloned version of the electronic passport used by the U.S. and other countries

ENABLING TECHNOLOGIES



Cloud Computing:
Supercomputing on demand

Location-based Computing:
Everything knows where it is

Pervasive Wireless:
Continuous connection

Wireless Power:
Always-on mobile devices

Sensor and Sensor Networks:
Everything in its right place

Ubiquitous Displays:
Every surface is alive

Simulation:
Modeling possibility space

Parallel Programming:
Applications for a
multi-threaded world

Deep Web:
Semantic engineering of
linked data

Signals:

ELECTRONIC PASSPORTS (IDENTIFICATION: FROM POCKET TO NETWORK)



The United States, along with dozens of nations across the globe, is requiring all passports to contain a radio-frequency identification chip, embedded in the passport itself. This will allow nations to track citizen travel abroad and visitor travel within the borders. Border stamps and near-universal interrogations about length of stay and countries visited will be phased out. This level of data will help speed international border crossings and provide accurate data about citizen travel, but the threat of information being stolen and/or used against a citizen by outside actors or governments themselves will increase.

Source: http://www.bundesdruckerei.de/en/press/press_photoarchive/photoarchive_idDoc/index.html

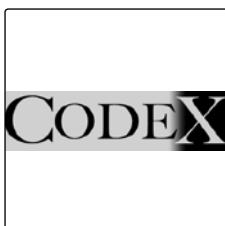
NATIONAL PRICING FOR ROAD INFRASTRUCTURE (TAXES AND TOLLS: FROM INDIRECT TO DIRECT TAXATION)



At the 2008 World Congress on Intelligent Transportation Systems, Ed Regan, a traffic planner and consultant, proposed replacing the gas tax by creating a "National Pricing for Road Infrastructure." This plan would charge drivers per mile driven, and tolls and fees would be automatically deducted from drivers' accounts. Every car in the country would be outfitted with a GPS-enabled device that would allow information about driving distance and location to be collected. This application could open the door to all kinds of information exchange about road conditions, traffic, location-based services, and safety systems.

Source: <http://blog.saimatkong.com/index.php/2008/07/23/no-stop-toll-trials-to-begin-in-november-smooth-traffic-no-jam/>

STANFORD CENTER FOR COMPUTERS AND LAW (CODEX) (LAW: FROM RIGID TO CONTEXT-AWARE)



Researchers at the Stanford Center for Computers and Law (CodeX) are exploring and building a world of embedded governance and law. Development of autonomous driving technology and a "cop on your shoulder" is creating a new environment for law enforcement and citizen empowerment. Another project, called the Autonomous Intelligent Cyber Entity (AiCE, pronounced "ice"), "explores the commercial and legal aspects/implications of an intelligent cyberagent and its evolution into an autonomous intelligent cyber entity."

Source: <http://codex.stanford.edu/projects.html>

CHINA'S GREEN DAM (LAW: FROM RIGID TO CONTEXT-AWARE)



The government of China has issued a directive requiring the installation of filtering software on all computers, ostensibly to protect children from offensive materials on the Web. However, the software will also track user behavior and prohibit unauthorized use of the Web. This extension of control and monitoring of end-users in the system is a sign of how some governments will use pervasive computational and communications technologies to implement policy.

Source: <http://greatfirewallofchina.org/>



CONCLUDING SECTIONS

What difference does this make?

Embedded governance will signal a huge shift in the way law and policy are created and enforced. The benefits of increased security, fairness, and efficiency will be weighed against the costs of increased surveillance, reduced privacy, and less room for discretion.

MORE EFFICIENCY, LESS DISCRETION

Embedded governance will alleviate some of the redundancy and inefficiencies of human-run bureaucracy, but it will also eliminate the ability of officials to use discretion in the application of law. “The letter of the law” and “the spirit of the law” will become synonymous. This will raise the stakes of generating law and increase the need for transparency. Citizens and lawmakers will ask much more seriously, “Do we really want this law?”

REAL-TIME GOVERNANCE

Embedded governance will enable a much more responsive system that can update itself in real time, based on current law and changing conditions. New regulations will be implemented without a significant time lag—they will download immediately into the devices and machines we use. A recall on a toaster that is dangerously defective, for example, will immediately disable the toaster until it is returned for a replacement.

MAKING PREVENTATIVE MEASURES POSSIBLE

Embedded governance will prevent many of the crimes and violations we see today from happening. Firearms will work only when operated by their rightful, registered owners. Office computers will shut down after 40 hours of work unless overtime has been authorized. Disasters and quarantines could also be managed more effectively if information about citizens were known and if laws were downloaded to change behaviors immediately.

ENABLING NONSPATIAL GOVERNMENT

Embedded governance might also lead to a system of layers of government, one of which would be nonspatial—that is, not tied to a location but instead concerned with universal standards for human behavior. Nonspatial government would allow legal systems to be layered over a geographic location and tied directly to citizens and their chosen rules. Embedded governance would allow the coordination of these layers to reduce internal conflict.



What to do differently?

Automated and intelligent enforcement of rules is not just for governments. Companies can use these technologies to make their workplace and staff more efficient and productive as well.

IDENTIFY FACILITIES, MACHINES, AND PLACES WHERE RULES AND POLICY COULD BE EMBEDDED

Companies should look for opportunities and places to embed policy into the work or office environment. Computers and software-embedded devices will be the first point of intervention, and as more and more devices become networked and intelligent, there will be new opportunities to link devices to policy.

RETHINK LIABILITY, RISK, AND SECURITY

In a world where the rules of the game are woven into the fabric of the field, companies must think about all the points where they come into contact with the law. Inspections, compliance, and safety regulations will be automatically applied to an organization's infrastructure and workforce. This will reduce much of the uncertainty around whether regulations are being followed correctly, but it will also reduce flexibility.

CREATE LIGHTWEIGHT, EXPERIMENTAL CORPORATE POLICY

An ironic outcome of a fully embedded system of governance is that rules will become more lightweight, not less. Because the slow process of implementing and learning new policy is circumvented, much more opportunity exists for experimentation with rules and strategy. During times of rapid change, an organization can prototype policy rapidly, searching for different behavioral or business modifications to create an optimal result.



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