Why Brenna Berman Is Giving Chicago an AIoT Upgrade

BRENNA BERMAN IS *at the front of a new wave of urban development. As the executive director of Chicago's City Tech1, she's working out how to reinvent cities for safety and efficiency using technology.*

"Cities are not growing as quickly and are not as flexible as the population is growing," Berman says. She's worked in city development for seven years, most recently as chief information officer for the city of Chicago, where her work focused on applying technology to solve modern urban policy and planning problems. In 2017, she became executive director of City Tech, an initiative from Chicago-based UILabs that brings together talent from academia, the private sector and city government to reinvent how the city is run.

Berman says city planners are still using guidelines and parameters that are nearly 50 years old. To bring cities into the 21st century, she is focused on using technology to gather data from around the city, learn from it and create more dynamic models to cope with volatile urban environments. Much of this technology centers on AIoT, the marriage of artificial intelligence with the Internet of Things. AI relies heavily on accurate data, delivered in high volume, to fuel its machine learning algorithms and produce accurate results, which are generated dynamically, based on the automation and learning elements of AI. IoT sensors scattered around smart cities can deliver constantly updated information about everything from traffic flow to water flow, providing regular, high-quality feedstock for AI algorithms.

The AIoT technology combination is already revolutionizing the urban environment. One report2 predicted that by 2019, 40 percent of local and regional governments will use connected devices to turn infrastructure like roads, street lights and traffic signals into assets that generate valuable data instead of necessary infrastructure that generates maintenance costs. Berman is already making this a reality for Chicago, and she hopes to continue finding ways to use technology effectively and democratically to prepare the Chicago for the future. And with the substantial investment Chicago has already made in IoT,

applying AI to the IoT data seems a natural next step.

Using AIoT on the Streets to Stop Accidents

One AIoT implementation Berman is involved with is a project called the Array of Things. When completed, it will be a citywide grid of 500 enterprise-caliber sensors that collects a panoply of data, including the movements of pedestrians and cars, temperature, pressure, light, vibration and ambient sound intensity information. Deployment of this initiative across the large footprint of the city was occurred over a two year period. Berman says the plan is to use this sensor data across a variety of AIoT projects designed to find the city's hidden stories.

"We're using AI to interpret photos to look at safety in intersections," she says, as an example. That project supports Chicago's Vision Zero4 initiative to eliminate traffic deaths from its streets. While cities often have a wealth of information from first responders and insurance companies about accidents that have occurred, she says, "data about the occurrence of accidents is not particularly helpful in preventing them. What you need is additional information about near misses, and cities don't have a lot of that information."

AIoT will help Chicago look deeper at the day-to-day activity on its streets. Using AI to analyze images collected by connected cameras will teach city planners about how vehicles interact with each other, the city's infrastructure and pedestrians. It will enable them to better design intersections and streets, work out where to segregate different traffic flows and tweak traffic light patterns to improve safety.

A Deluge of Data to Manage Flooding

Another use of AI that interprets images will allow city officials to address street floods—one of Chicago's growing challenges. Sensors will collect images of the street, and AI will be able to distinguish between dry and wet pavement, ice and standing water, and even tell how deep that pooled water is. With AIoT, Berman envisions automating the process of collecting and applying data that

is currently manual and often unreliable, and harness the automated learning to predict and preemptively address flood conditions to improve the safety and security of Chicagoans moving about the city streets.

"The city has no proactive indicators of where [street flooding] is happening because people don't call that in," Berman explains. "This will help the city create an early indicator and prediction model through AI processing of street conditions." The additional benefit of this AIoT application has bottom-line implications for Chicago taxpayers—it's expected to save millions by preventing costly damage to city infrastructure.

Berman sees much more potential in the AIoT to help solve some of Chicago's pressing problems—though hurdles do remain, not all of them technological. To spread AIoT across all 234 square miles of the city requires involving more stakeholders to ensure any changes are effective and efficient for everyone, she says, and balancing all those voices in the design and planning phase is perhaps the most challenging aspect of all.

"It's tempting for cities to take a command and control approach because you get more done," she concludes. "There's a cost to collaborative innovation, but there is a benefit to it too, because the outcomes are better."

And with AIoT's help, Berman hopes to create an infrastructure that continues to learn as the city changes, provides new insights, and drives safety and efficiency for all who live, work and play there.

Learn more about the AIoT

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Sources:

1. City Tech
2. One report
3. Array of Things
4. Vision Zero