



Redefining Smart Cities with Cloud Technologies

It's time to redefine "smart" cities and what some people like to call "smart government." The original concept of smart cities was that interconnected devices could gather data in real time. Trash cans with sensors, "intelligent" buildings with energy saving devices and seamless transportation experiences were core to the smart city concept.

Today, the definition of what makes a government entity "smart" extends beyond sensors and 5G networks. Effective smart government applications integrate data, analytics and security to produce holistic insights that benefit everybody: residents, workers and visitors.

Cloud technologies are essential to redefining smart government because they establish a firm foundation for the practices and policies that produce useful business intelligence. This brief explores the central role of cloud technologies in smart government applications and offers guidance for successful smart initiatives.

Where to Start when Redefining Smart Government

Think about the construction of a home: "You don't build a house from the roof down," says Celeste O'Dea, managing director for strategy and business development at Oracle. "You build a house from the foundation up."

In O'Dea's analogy, digital infrastructure based in the cloud forms the foundation of an effective smart government initiative. Cloud-based platforms provide containers that frame up the house. "The windows might be your low-code application development tooling," she says. "The walls might be your data warehousing. And the roof might be your analytics and visualization."

Thus, the data and sensors that traditionally define smart government are more like the home's bedrooms: essential components of the greater whole.

Transit provides a useful example: A smart application dovetails data from sensors in streetlights, crosswalks, buses and bus stops. "I want to bring those pieces together holistically at scale to get a better picture of what's happening within my city," O'Dea says. This kind of high-level intelligence helps a city achieve goals like fighting traffic congestion and ensuring low-income people have transportation to work.

Redefining smart government with cloud technologies helps agencies build a firm foundation in four key areas.

Data and security. Analytics mines data from disparate sensors, devices and applications. The data flows from multiple locations in different constructs and frames: structured and unstructured; relational and non-relational.

Smart government applications converge data insights in a new home in the cloud. This poses a challenge underscored by the relentless tide of cyber intrusions and ransomware attacks.

"We need to do all this in the most secure way possible," O'Dea says. Cloud providers go to great lengths to lock down their technology, but they are only half of the equation. The shared security model of the cloud requires strong protections from the customer as well.

This is where a zero-trust security model proves its value. Zero-trust security does not assume anybody has the right to be anywhere on a network. Every transaction, user, device and application on a network must be authenticated and approved.

Even if intruders sneak in with stolen credentials, for instance, zero-trust controls ensure they cannot move up, down or sideways. "You cut them off at the knees and eliminate them from being able to spread throughout the network," O'Dea adds.

Agility and resilience. Smart applications depend on speed, scale and the ability to survive a crisis — all core advantages of the cloud.

Cloud environments typically virtualize the three-tiered data center, using software to replicate computing, storage and networking. This enables developers to rapidly spin up new development environments and replicate data center resources. Functionally unlimited storage allows robust backup, recovery and business continuity.

Let's say a city or county wants more precise estimates of the costs of building and maintaining roads and sidewalks. In a smart application:

- Sensors throughout the city stream real-time data on pedestrian and vehicle traffic.
- Archival data allows historical comparisons of user patterns and maintenance expenses.
- Third-party databases packed with weather and demographic insights deliver context on road and sidewalk life cycles.
- Analytics software pulls everything altogether to find correlations and relationships that were previously invisible.

“We need to bring these data points together at scale to really get full value out of the component parts,” O’Dea says.

For most government entities, the cloud provides the only practical path to the scale, speed and resilience that enable smart applications.

Staffing and automation. In the traditional, hardware-centered data center, IT people devote most of their time to care-and-feeding activities. Far less time goes toward using their training and experience to build better outcomes.

The cloud helps IT leaders reverse this model, freeing their staff to drive more tangible value. Cloud providers provision the hardware, update the software and hold up their end of the security relationship. Cloud environments are excellent places to use tools like infrastructure-as-a-service, low/no-code applications and robotic process automation to eliminate repetitive tasks.

Eliminating rote processes gives your IT people:

- More opportunities to strengthen their technical skillset, making them more valuable to your organization
- More work they find interesting and challenging; this can help governments retain skilled talent

“When they spend more time on interesting stuff that has direct, meaningful impact on the organization and constituents they’re serving, then your ability to retain and attract good people is going to be higher,” O’Dea suggests.

Equity and transparency. Cloud environments centralize and standardize. They also enable access on any internet-connected device. Given that almost everybody has an internet-linked phone, the cloud can be an engine of equity for residents, workers and visitors.

“No matter where people fall on the spectrum of diversity, revenue or income, and no matter which pocket of your city or county they live in, you can have equity across service and resource availability,” O’Dea says.

Smart applications hosted in the cloud can also make data-driven insights available to the entire population. Transparency helps people understand the impact of the choices their government leaders make. Residents can make up their own

minds on the value of government initiatives rather than nurse suspicions that decisions are happening behind closed doors.

“People can see that government initiatives are being undertaken for the greater good,” O’Dea adds.

Conclusion: Tips for Driving Success in Smart Initiatives

Ultimately, redefining “smart” government means integrating apps, data and security into a program that produces better outcomes for residents, workers and visitors. To improve their chances of success, government entities should keep these strategies and tactics in mind:

Strategies

- Plan for the inherent complexity of integrating multiple apps and data sources.
- Think about integration from the beginning: Make sure you’ll have the agility to add new features and services in the future.
- Architect everything from a strong foundation.

“You really have to think architecturally about making sure you have laid a foundation that is stable, secure and scalable,” O’Dea says.

Tactics

- Take a multi-cloud approach. Different cloud vendors offer different workload options.
- Spend time learning the subtleties of contracting in the cloud and establish strong procurement policies.
- Extend an on-premises workload with a chatbot for quick constituent engagement.
- Start with low-hanging fruit: Layer low-code development on top of an existing application for mobile phone access.

The smart way forward for governments is to ensure their home in the cloud has the right foundation to scale quickly and easily when it’s time to remodel and add new rooms.

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