AN INDUSTRY JOURNEY:

TRANSFORMATION AND OPPORTUNITY

IN THE CLOUD

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It is time for transformation in the public sector. The events of 2020 and 2021 forever changed expectations for how public agencies work, deliver services, and engage with their communities.

SUDDEN TECH SHIFTS

As the coronavirus pandemic progressed, we saw an accelerated adoption of technology enabling remote work and facilitating virtual services. Familiar, in-person workflows, for example, transitioned to web-based cloud solutions like digital content management, electronic time sheets, and employee self-service. These solutions proved easily scalable as community and staff needs evolved.

Technology that facilitated new ways to provide services and share information connected government to business partners and the public in new, beneficial ways. Automating business functions and enabling self-service for licensing, tax remittance, and fee collections expedited actions necessary for economic recovery. Online permitting, inspection, payment, and enforcement functions bolstered community development. Public-facing community engagement tools allowed residents to make payments, participate in virtual meetings, report non-emergency issues, and request and respond to services in convenient, intuitive, and immediate ways.

In schools, integrated student transportation systems and parent communication apps kept buses running on time even with substitute drivers and provided critical contact tracing and school and parent notification functionalities. Virtual courts provided flexible options to handle cases for video technology. Online dispute resolution helped individuals reach family or small claims case resolution from their own homes, outside of court hours. Open data dashboards and maps helped leaders collect and make sense of data to draw correct inferences and take smarter action.

ADDRESSING CHALLENGES, HARNESSING MOMENTUM

Even though these advancements may have loomed in leaders' minds as future considerations, their quick adoption in crisis creates a unique momentum and moment of revelation for the public sector: How can these solutions continue to make operations smarter and more sustainable? How can the benefits of mobility, online engagement, and remote citizen interaction continue to evolve and drive communities forward?

These questions intersect with three noteworthy points unique to this time:

> First, the public health crisis of the pandemic drove residents to rely on and trust their state and local governments more than ever before. As new technology adoption met obvious community and resident needs, the public's buy-in for such investments remains high.

> In addition, the pandemic elevated the importance of technology and the role of the CIO in the public sector. According to Gartner research, "The COVID-19 pandemic has increased government executives' understanding of the positive role technology can play in achieving their public purpose. In conversations with our analysts, government CIOs have indicated that the role technology has played throughout the crisis has elevated their leadership profile within their organizations."[1] In other words, now is the perfect moment for CIOs to leverage their skills and elevated roles to drive long-term technology strategies.

> Finally, public sector leaders are faced with a once-in-a-generation opportunity to leverage new federal funding sources to strengthen communities and weather future crises. This cash influx comes with significant pressure to maximize dollars and not waste the moment.

In short, the public sector is tasked with managing unforeseen technology momentum and strategizing around smart relief fund investment while still navigating public health and other political and societal challenges.

The good news is governments can — and already are — using this changing, challenging context as a springboard for future stability.

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Below, we explore important areas of opportunity that come from the industry's current challenges and discuss why the cloud is the key to leveraging this moment for long-term success.

MOVING FORWARD, BETTER

With creative, innovative uses of technology newly in play and new funding sources to support recovery efforts, leaders are looking for ways to make strategic investments and optimize resources. Given small moments to pause and look ahead, elected officials and staff leaders alike may be wondering what's next. This depends on driving pandemic-accelerated technology transformation to do the following:

Improve Equity

Successful communities are ones in which all needs are met. And communities in which all voices are heard benefit from smarter policy decisions. New and creative ways to break down barriers and create more accessible government, particularly through self-service opportunities, can result in more equitable communities.

Enhance Security

A recent security report noted cyberattacks on state and local governments are up 50% in the last three years. Extended work from home has increased cybersecurity risks. To stay ahead of the evolving threat landscape, having superior threat management, disaster recovery capabilities, automated backups, and server redundancy are critical. System flexibility and resiliency ensure an incident only causes a minor interruption to business-as-usual, not a full-scale suspension of operations.
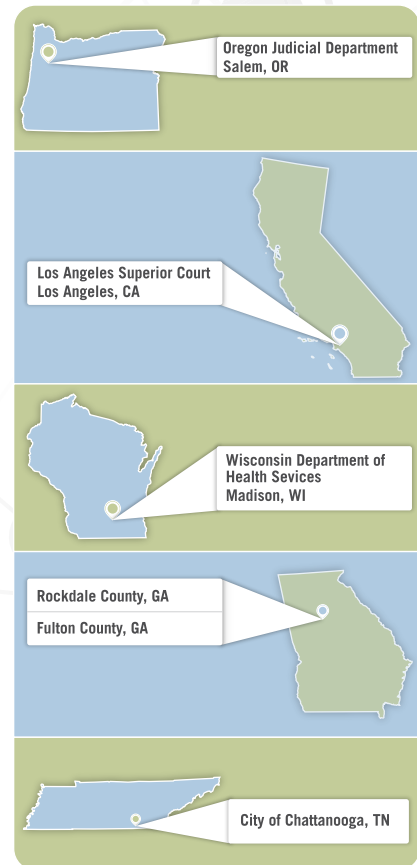
Find and Deliver Solutions to Community Issues

Moving forward, data must be an integral part of a government's operations. Breaking down silos and surfacing relevant data supports smarter decisions and delivers better department and community outcomes. Whether it's finance, tax, permitting and licensing, or public safety, courts, justice partners and school systems, data ties it all together and creates the connections that solve problems. Further, finding ways to integrate internal data with relevant third-party data empowers leaders with insights they need for a complete picture of the challenge they seek to overcome. This results in better policy, more effective resource allocation, and measurable results.

Advances in these areas are already happening in jurisdictions across the country. Relevant, scalable examples include:

» The **Oregon Judicial Department** helps self-represented litigants navigate complex court processes and fill out forms correctly on their own with a web-based platform that simplifies documents into plain-language questions.

» The **Los Angeles Superior Court** uses a cloud-based online dispute resolution tool to help co-parents create parenting plans without having to hire a lawyer, find childcare, take time off from work, or travel to a courthouse.

» The **Wisconsin Department of Health Services** uses a cloud-hosted case management system for its IRIS (Include, Respect, I Self-Direct) Waiver program serving more than 22,000 seniors and individuals with disabilities. The system provides users with a way to manage their own benefits, directing their care and retaining agency over their health while at home or in another care setting.

» **Rockdale County, Georgia**, overcame network outages and two security incidents by migrating its solutions to the cloud for enhanced data security and continuity of operations.

» The **City of Chattanooga, Tennessee**, uses an enterprise cloud solution to maximize its data for better service. Analyzing incoming calls to the fire department, for example, showed most calls were requests for medical assistance. This insight led to a partnership with a local agency to check on frequent callers, which saved fire department resources while enhancing service. The open data portal supported by the solution also helps the city measure and track equity and transparency efforts, including through a policing and racial equity dashboard.

» **Fulton County, Georgia**, uses an enterprise data platform to connect and share data across criminal justice, courts, and behavioral health systems. This helps leaders examine each aspect of the continuum of care — pre-arrest, housing, court collaboration, medical treatment, and re-entry — to increase community safety and reduce recidivism.

The commonality in the above examples is the use of cloud-enabled technologies. Cloud-based technology solutions like these help governments enhance operations, become more agile and secure, improve service, and solve problems.

Oregon Judicial Department
Salem, OR

Los Angeles Superior Court
Los Angeles, CA

Wisconsin Department of Health Sevices
Madison, WI

Rockdale County, GA
Fulton County, GA

City of Chattanooga, TN

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PATHWAYS IN THE CLOUD

Moving to the cloud is an undeniable trend in the public sector. As noted in this GovTech article, "State and local public sector agencies have long been making a move to 'cloud first' and now 'cloud smart' strategies." A 2019 NASCIO state CIO survey found 34% of IT leaders had a cloud migration strategy in place, and 51% had a strategy in development. "COVID-19 has opened up the throttle on those efforts," continued the piece. Tyler Technologies' own Chief Operating Officer Jeff Puckett emphasized the same in his remarks to public sector technology users at the 2021 Tyler Connect conference. "Organizations that were already in the cloud at the onset of the pandemic had an advantage," he said. "Cloud technology provided seamless remote access to data and systems the minute buildings were closed."

It's important to note Tyler's cloud strategy anticipated this movement. Its own cloud development not only kept pace with the public sector, but it is also mature and ready to support clients wherever they are along their technology roadmaps. Tyler was an early pioneer of cloud-hosted solutions, with the first applications in Tyler's private cloud appearing in 2003. Today, Tyler develops and deploys dozens of cloud-optimized and cloud-native applications. For nearly two decades, Tyler's staff has developed expertise in supporting cloud-hosted environments, cloud-native mobile applications, cloud data storage, digital content access, multi-agency deployments, online public portals, and more. This was all done with purpose, recognizing the cloud helps government software users in any role, as well as the communities they serve.

"Cloud benefits include more predictable budgets, reduced IT infrastructure expenses, enhanced security and disaster recovery, and easier compliance with federal standards like CJIS," Puckett explained. "Cloud solutions also enable departments to use data as a strategic asset in the design, management, and delivery of innovative programs and services. These solutions create better connections between departments, across agencies and jurisdictions, and with citizens."

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MORE IS POSSIBLE

It's no surprise that those benefits directly support and enable the very outcomes noted above; the outcomes leaders should take this moment to drive. Perhaps most important is the notion of meaningful, solution-bearing connections. Effectively connecting governments to each other and citizens to government is done best in the cloud. In fact, the cloud enables governments to realize the promise of the Connected Communities Vision, a long-term technology strategy that serves department and user needs through a common digital foundation.

This foundation integrates workflow, tasks, and processes, and strengthens information-sharing across multiple departments so government leaders and staff have the ability to easily communicate, collaborate, and make data-driven decisions. When technology connects data, people, and processes across agencies and geographic boundaries, government becomes more transparent and responsive, and safer, stronger communities result.

Tyler's cloud-based solutions specifically support Connected Communities' capabilities and outcomes through:

- **Transparency and open data initiatives**

- **Government e-services that the public and vendors can access through web and mobile apps and portals**

- **Interoperability and data-sharing between departments and across jurisdictions**

- **Improved insights from easily surfaced and accessible data**

The above transform the way the public sector works internally and with the public. Eliminating on-premises silos help internal and external partners leverage relevant data for coordinated and more successful decision-making. Cloud-enabled solutions further facilitate coherent and consistent reporting and citizen engagement strategies across departments and jurisdictions.

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AWS AND A POWERFUL COLLABORATION

As noted above, Tyler developed and continues to host certain products in the cloud. To provide even more support to clients in an evolving digital world, Tyler began working with Amazon Web Services (AWS). This collaboration allows Tyler to leverage AWS to help clients deliver better services and experiences to their communities while improving security, reducing costs, and driving efficiencies.

Tyler started working with AWS in 2019 to deliver better solutions to its clients. Tyler Technologies is the largest provider of cloud technologies in the public sector, hosting 4,000 deployments and providing cloud systems to more than two million users. AWS pioneered the cloud infrastructure market and has industry-setting security standards. Security is a shared responsibility between AWS and its customers where AWS is responsible for the security of the cloud while Tyler and its clients are responsible for security on the cloud.

Leveraging AWS delivers an unparalleled experience to clients who are ready for the cloud. For example, Tyler is adopting AWS standard services across all cloud-optimized and cloud-native applications, providing platform interoperability required for reliable connections, data-sharing, and integration. Tyler will also leverage the secure infrastructure of AWS for application hosting. Notably, Tyler is evolving software solutions to be optimized for AWS on the back end in a way that will be unnoticeable for Tyler private cloud-hosted and on-premises clients alike. The overall cloud strategy between Tyler and its clients is one of full partnership and client preference.

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PUBLIC SECTOR PROOF POINTS

With the client experience as the driver, a cloud focus will improve installation and upgrades, Connected Communities' capabilities, and streamlined support models. For any type of user, the cloud offers monetary savings, enhanced flexibility, connectivity, mobility, security, and scalability. These benefits manifest themselves differently according to a department's mission and constituency. In public administration, for instance, enterprise resource planning and civic services cloud-based solutions have most recently enabled remote work and met increased community engagement needs. Self-service portals, remote payroll access, mobile apps, digital workflows, and data and insights are examples. Digital workflows and remote capabilities are important to schools as well. In that environment, the benefits are seen in managing absences and substitutes, capturing accurate attendance, or optimizing bus routes.

Practical benefits of Tyler's cloud-enabled solutions include:

Best User Experience

Solutions hosted in the cloud are not bottlenecked by an inflexible and aging hardware infrastructure. Responsive, scalable systems are necessary for governments to optimize processes and respond quickly to changing community needs.

Software users benefit from improved installation and upgrades, streamlined support models, uninterrupted day-to-day operations, and reduced training. More timely and stable software releases, or continuous deployment, provides the best possible user experience and can only be realized in the cloud.

Enhanced Security Protections

Reducing vulnerability to cyberattacks has never been more important. Solutions in the cloud can deliver the latest known security protections. AWS helps satisfy security and compliance needs with the most security standards and compliance certifications including PCI-DSS, HIPAA/HITECH, FedRAMP, GDPR, FIPS 140-2, and NIST 800-171.

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Reduced IT Burden

The cloud reduces IT overhead and eliminates costly, maintenance-heavy physical hardware infrastructure. In the cloud, maintenance and upgrade responsibilities from many silos are shifted to a shared cloud infrastructure. This moves IT staff away from back-end tech stack support and frees them to focus on the user application experience.

Actionable Insights

The future of state and local government is really about data and what it can do. Cloud solutions enable governments to use data as a strategic asset in the design, management, and delivery of innovative programs and services. Cloud-based solutions can aggregate disparate data in accessible dashboards, helping leaders make smarter decisions for their communities.

Executive insight capabilities, for example, enable mayors, city managers, finance directors, superintendents, and department heads to easily understand and monitor the health, performance, and service level of their organization.

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At present, 65% of Tyler clients are selecting cloud deployments for their solutions. New Castle County, Delaware, for instance, transitioned to a cloud-based ERP solution and is now enjoying intuitive, user-centered workflows, self-service capabilities for customers, and increased transparency and dashboard reporting. "From a technology perspective, cloud solutions eliminate hardware costs, ongoing maintenance, and operations costs," said Michael Hojnicki, New Castle County's chief of technology. "County leadership predicts ROI will materialize from process efficiencies and improved quality of financial data."

Ramsey County, Minnesota, used the cloud-native Socrata open data platform and Perspectives to simplify the annual assessor report in a way that is usable and makes sense for all stakeholders. Pierce County, Washington, used the same solution to automate a public ARPA performance report by surfacing financial data in an intuitive, web-based report.

The City of Los Angeles, California, created internal and external access to nearly 1,800 datasets through a cloud-based, centralized DataLA portal. The portal lets residents, employees, other jurisdictions, and the media view and work with the data in several ways. Commonly requested information is formatted into easy-to-understand views. Intuitive dashboards present summary data about city services and expenditures, as well as progress on sustainability plans for the environment and economy.

In Dallas County, Texas, the county and court clerk integrated a cloud-enabled court records platform with its existing case management system to offer up case information to more than 4,100 online users and expand the types of records legal professionals can view. What's more, the state of Texas partnered with the platform to unite case records spanning across jurisdictions in all 254 counties into a single database. Increased access to cases across hundreds of courts necessitates thoughtful and robust security. Using the AWS Cloud, they can protect the integrity of sensitive court data while still providing appropriate access.

The Central Bucks School District in Doylestown, Pennsylvania, completed a fully virtual implementation of its software as a service (SaaS) cloud solution during the pandemic, moving manual work in static spreadsheets to an efficient, responsive, accessible process for its $342 million budget. Likewise in schools, District 214 in Arlington Heights, Illinois, used its transportation management system to create an innovative shuttle-based schedule to transport nearly 12,000 students to more than 25 off-campus experiential programs. The system's flexibility accommodates the daily schedule changes of each student and is intuitive for easy staff training.

These and other demonstrated successes represent just the tip of the iceberg when it comes to the public sector's future in the cloud.

EMBRACING THE FUTURE

Events like the pandemic compel CIOs and other government leaders to work iteratively, resulting in innovation and improved outcomes for residents, businesses, and communities. In many jurisdictions, the pandemic drove the adoption or expansion of cloud-enabled solutions, especially as the urgent, evolving challenges brought a new recognition of the cloud's many benefits.

Leveraging events to drive modern technology adoption, including accelerating moves to the cloud, opens a new window for public sector leaders. Combined with increased public demand for digital services and new funding sources, governments would be wise to seize the moment and include the cloud in their long-term technology strategies.

As states, cities, and counties are already demonstrating, the cloud has the capacity to push the public sector beyond modernization and into real transformation. This transformation will optimize pandemic-driven advancements, enable the Connected Communities Vision, and result in real-world solutions to some of society's most pressing issues. The industry is, indeed, headed in the right direction with the cloud and its many exciting promises.

[1]*Gartner, A Master CIO in Government, 2020 (G00730356); Published August 5, 2020; Analysts: Alia Mendonsa, Alvaro Mello*

SOFTWARE THAT THINKS LIKE YOU DO.

Tyler Technologies (NYSE: TYL) provides integrated software and technology services to the public sector. Tyler's end-to-end solutions empower local, state, and federal government entities to operate more efficiently and connect more transparently with their constituents and with each other.

By connecting data and processes across disparate systems, Tyler's solutions are transforming how clients gain actionable insights that solve problems in their communities. Tyler has more than 27,000 successful installations across more than 11,000 sites, with clients in all 50 states, Canada, the Caribbean, Australia, and other international locations.

Tyler was named to Government Technology's GovTech 100 list five times and has been recognized three times on Forbes' "Most Innovative Growth Companies" list. More information about Tyler Technologies, an S&P 500 company headquartered in Plano, Texas, can be found at tylertech.com.

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