DIGITAL
TRANSFORMATION
SKILLS FOR
GOVERNMENT

— AND HOW —

PUBLIC SECTOR
ORGANIZATIONS
CAN ACQUIRE THEM

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1 INTRODUCTION

" For government and public sector organizations, digital transformation represents an opportunity to think and operate like digital companies

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Technology plays an increasing role in everything we do. In every sector it is shaping growth, disrupting industry landscapes and providing the catalyst for businesses to transform themselves with new business models, products, services and experiences.

For government and public sector organizations, digital transformation represents an opportunity to think and operate like digital companies in the way they engage their customers, empower their employees, optimize their operations and transform their services. But these organizations also face the challenge of a significant shortage in the skills they need to achieve these goals.

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2 DIGITAL
TRANSFORMATION:
DRIVERS, OPPORTUNITIES AND CHALLENGES

"Those that can harness the ubiquitous, disruptive force of technology stand to become more agile, drive efficiency, transform their services and engage users
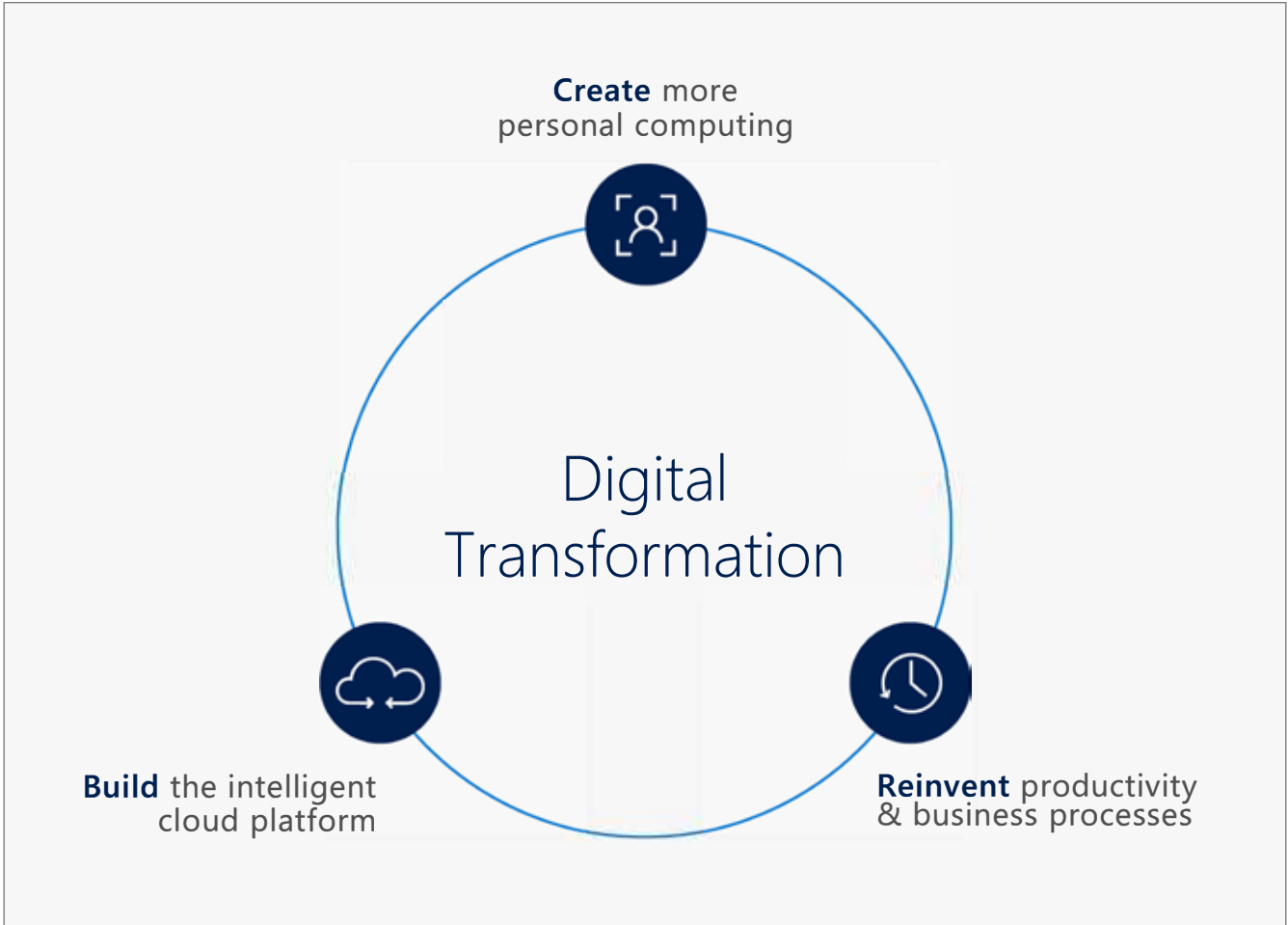
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The rise of disruptive technologies such as connected devices, the internet of things (IoT), growing volumes of data, advanced analytics, machine learning, artificial intelligence and augmented reality have brought great opportunities – and great challenges – for organizations of all kinds.

Capitalizing on this phenomenon is the key to innovation and growth. Those that can harness the ubiquitous, disruptive force of technology stand to become more agile, drive efficiency, transform their services and engage users. The results can be staggering – private sector organizations that are mature in their digital transformation journey generate an average of $100 million more in additional operating income each year than those that lag behind.[1]

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Government organizations are well aware of the impact of digital on their sector. A recent survey by Deloitte Public Sector Research found that 76% of respondents felt that digital technologies are disrupting the public sector, and 96% felt that digital technologies are having a significant impact on their domain.[2] Deloitte identified cost and budget pressures and citizen demands as the two primary drivers for digital transformation, with government directives also having significant influence. Those drivers differ across different countries – for example, cost and budget pressures are driving transformation in 56% of public sector organizations in the UK, while 64% of those in Canada cite citizen demands as the key driver.

But many feel that their organization is unprepared for a digital, citizen-centric world. Only 30% assessed their digital capabilities as ahead of other public sector organizations, and nearly 70% said they lagged behind the private sector.

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Create more
personal computing

Digital
Transformation

Build the intelligent
cloud platform

Reinvent productivity
& business processes

By managing digital transformation astutely, governments can drive productivity, increase mobility and innovate new digital services across and between multiple departments and agencies, and to a broader set of citizens and stakeholders. But in order to achieve this, they need to navigate the expectations of a changing workforce, address evolving cybersecurity threats and manage a host of other challenges. And public sector organizations in particular face the major challenge of a significant shortage in the skills they need to achieve these goals.

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3 ESSENTIAL SKILLS ARE IN DEMAND

" It's essential that new tools and processes are relevant to the people who will use them, and that those people are enabled to recognize the value transformation will deliver

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As governments work toward digital transformation, they face the challenge of integrating and exploiting rapidly growing volumes of data with their existing legacy systems. To achieve this, they need access to a combination of essential skills.

In a world that is connected by an increasing number of apps, tablets and social media, data has become a critical currency for every organization. As digital channels proliferate and the volume of data continues to grow, data scientists and statisticians are needed to provide the statistics, mathematics and programming expertise that can turn data into insights that support the organization's strategy and empower fast, informed

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EARNINGS AND GROWTH: COMPUTER AND IT OCCUPATIONS

Role	Median annual wage, May 2015	Earnings of highest 10%	Projected growth in employment 2014–2024
Computer and information research scientist	$110,620	> $170,610	11%
Computer network architect	$100,240	> $155,250	9%
Computer support specialist	$48,620	> $81,260	12%
Computer systems analyst	$85,800	> $135,450	21%
Database administrator	$81,710	> $127,080	11%
Information security analyst	$90,120	> $143,770	18%
Network and computer systems administrator	$77,810	> $124,090	8%
Software developer, applications	$98,260	> $153,710	19%
Software developer, systems software	$105,570	> $159,850	13%
Web developer	$64,970	> $116,620	27%

Source: Bureau of Labor Statistics, US Department of Labor, Occupational Outlook Handbook, 2016-17 Edition, Computer and Information Technology Occupations, on the Internet at http://www.bls.gov/ooh/computer-and-information-technology/home.htm (visited July 19, 2016)

decisions. Database administrators provide the skills needed to make sure that data is collected, stored and used in a secure and compliant manner while ensuring that the right data is available to serve the needs of the organization.

Big data analysis capabilities are increasingly in demand as organizations seek to turn their accumulated data into business intelligence. In a digital organization, business intelligence

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analysts provide data mining, cleansing and reporting skills to generate insights that support business decisions and yield a quantifiable return on investment.

Computer systems analysts are needed to design systems and processes that combine technology expertise with business strategy to serve the specific needs of the organization. Working in collaboration with decision-makers and end users, their skills are invaluable in researching solutions, providing cost-benefit analyses for any upgrades, overseeing the installation of systems, testing them and troubleshooting any problems.

Security is a key concern for public sector organizations, whether they store their data on premise or in the cloud. IT architects play an important role in managing the security architecture and ensuring compliance with existing rules and regulations. Their skills in risk assessment, and in the creation and implementation of updates to

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the security architecture as new threats continue to emerge, are critical to the digital organization.

Digital transformation combines people, processes and technology, and change management skills are vital to achieve the cultural shift that will enable a truly digital organization. Many government organizations have used the same processes for decades, so it's essential that new tools and processes are relevant to the people who will use them, and that those people are enabled to recognize the value transformation will deliver to them and to the organization. Long-term commitment to transformation at the highest level, with a dedicated team that can align it with strategy and communicate its value effectively throughout the organization, is critical to achieving this.

These skills command high salaries on the employment market – and as demand continues to grow, government organizations find it increasingly difficult to compete with the private sector in attracting them. For example, the average computer and

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information research scientist currently earns $110,620 a year, with the highest-paid 10% earning more than $170,610.[3] The US Labor Department reports that database administrators made a median salary of $81,710 in 2015, with the highest-paid 10% in the profession earning more than $127,080 that year.[4] Employment of statisticians and computer systems analysts is projected to grow 34% and 21% respectively from 2014 to 2024 – faster than the average growth for all occupations.[5] And an 11% increase in employment of database administrators by 2024 means that 13,400 new jobs will need to be filled.[6] Average pay for computer network architects in the US is $100,240 per year, with a 9% increase in employment expected by 2024.[7]

Employing these skills in-house might present a challenge to government, but by partnering with carefully chosen experts they can access the skills they need for a successful journey to transformation. Microsoft and its partners have the technology skills and vast industry experience available to governments, as and when they need them, to help fill the growing demand for transformational skills.

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4 BUILDING SYSTEMS OF INTELLIGENCE

" Systems of intelligence represent the continuous digital feedback loops that help organizations draw better insight out of data and convert it to intelligent action
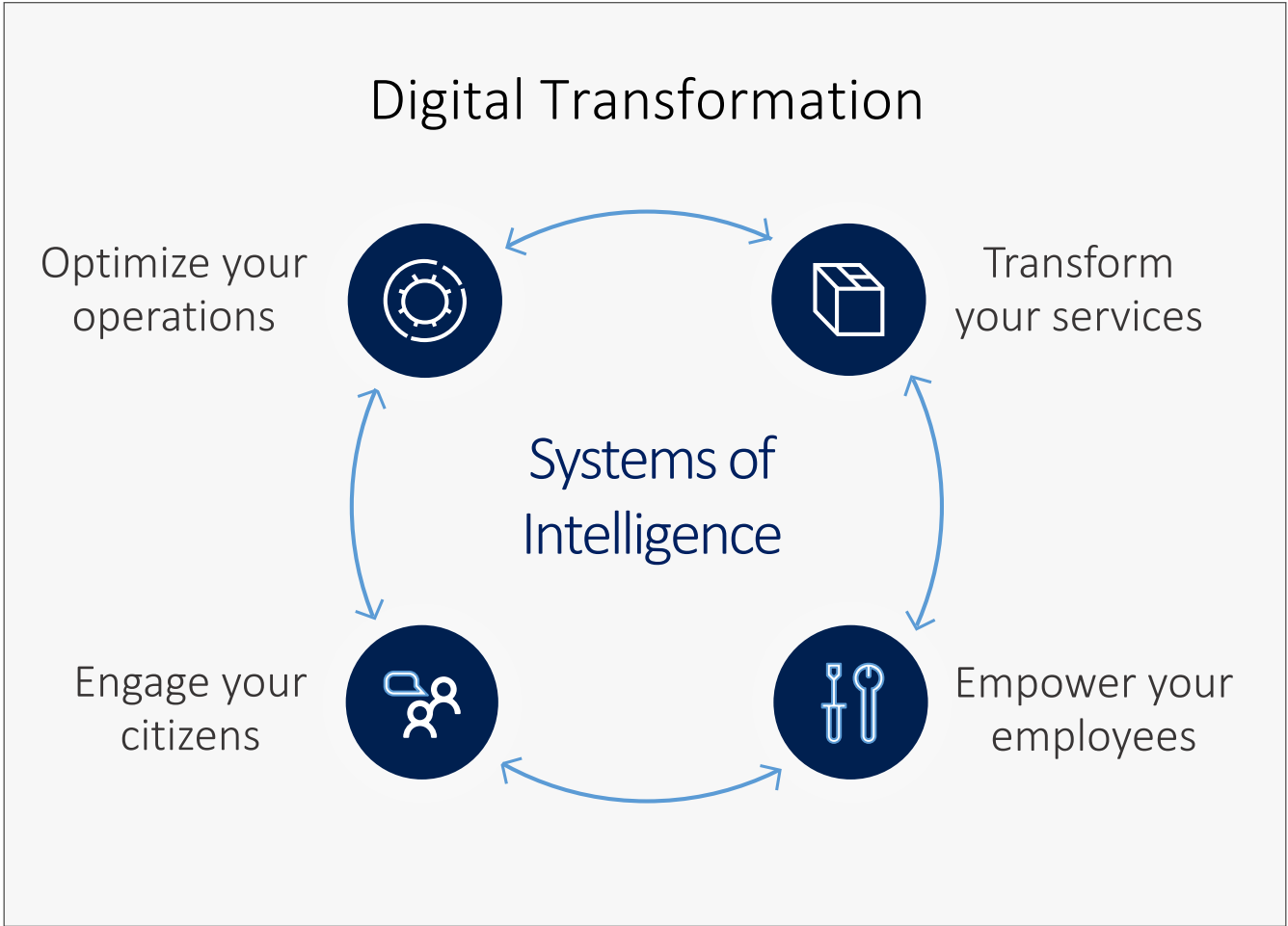
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n our mobile-first, cloud-first world, digital transformation is achieved through bold innovation, but it is not simply a case of taking advantage of digital technologies. Successful digital transformation results from connecting people, processes and technology to empower every person and every organization to achieve more.

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Understanding how technology is changing both the business and its core business model is a critical starting point for transformation. Answering these questions requires the mindset of a digital organization that is anchored on building systems of intelligence, rather than one that deploys individual technology solutions.

Systems of intelligence represent the continuous digital feedback loops that help organizations draw better insight out of data and convert it to intelligent action – to engage with citizens, empower employees, optimize operations, and reinvent products and

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Digital Transformation

Optimize your operations

Transform your services

Systems of Intelligence

Engage your citizens

Empower your employees

business models. These rich systems of intelligence represent the combination of technology, people and process. They define an organization's competitiveness and ability to change the landscape of the industries in which it participates, and they are essential to digital transformation.

Microsoft's platform approach entails three key areas of innovation:
- Create more personal computing by enabling applications and data that transcend individual devices

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- Reinvent productivity and business processes through productivity tools that enable people to focus on what matters most to them and the organization
- Build the intelligent cloud platform that enables organizations to convert their data assets into intelligence that can yield insights to inform appropriate action, and fuels rich experiences across the organization's systems, critical apps and services.

The approach is designed to enable organizations to create the systems of intelligence that enable digital transformation, through technology that enables others to innovate, build their own technology and create the solutions that help them achieve

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Reimagining public service

With over 1.4 million residents in 12 district councils and 300 town and parish councils, Kent County Council, UK, residents have a broad set of service needs in everything from help with small business growth to managing a growing senior population. Kent looked at digital technology as a way not just to improve how it delivered services, but as a way to completely reimagine how it served its entire population.

"We wanted to think big, we wanted to think bold, and we wanted to think imaginatively about what was in the art of the possible with new technology," says Elizabeth Harrison, Economic Development Manager for Kent County Council.

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The council worked with Microsoft to reimagine the way it delivered health and social care services. Residents can now control and monitor their own health record with Microsoft's health platform, and with their mobile phones, and they are able to share that data with their carer network in a secure, reliable and cost-effective way.

"Working with Microsoft and working with technology seems to us to be the only way really to develop a new business model so that we can deliver services to help people live longer, independent lives," says Debbie Johnson, ICT Business Development Manager at Kent County Council.

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5 CHANGE MANAGEMENT

“ Change is an emotive subject for many people, and every organization has a mixture of visionaries and skeptics

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Government organizations face a unique set of challenges as they approach digital transformation. "While most government organizations see the benefit of digital transformation, many of them are still working with legacy technology investments and paper-based processes," says Lina Mongrand, Worldwide Public Sector Services at Microsoft. "Change is an emotive subject for many people, and every organization has a mixture of visionaries and skeptics. Initially, it can be difficult for them to collectively visualize exactly what they want to achieve and how they can achieve it while adhering to regulatory requirements, protecting their data and ensuring continuity of services."

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At this critical early stage in the transformation journey, the expertise of Microsoft and its global network of partners is proving invaluable in providing the skills and best practices that build the foundations for success.

"By focusing on solutions for specific public sector scenarios, and then discussing the business processes and challenges that are involved, organizations can develop a vision of how digital technology can help them achieve their goals," says Mongrand. "That's the starting point of our discussions with customers. We discuss with them what they want to achieve – for example, providing a seamless citizen service across any device or sharing

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information from citizens with field agents and government officials – and provide visual demonstrations to illustrate specific scenarios. That could be an app that enables citizens to report issues in the street which are then taken care of by mobile operatives, or a more complex service, depending on what the organization wants to achieve. What works well is to start with something small, perhaps in a specific department or agency, and to build on the experience and skills gained through that."

Once a clear vision of the goal is established, a people-focused approach is essential in making sure that digital transformation reaches its full potential to empower every person and every organization to achieve more. Accenture's annual Technology Vision report identifies emerging IT developments that will have the greatest impact on companies, government agencies, and other organizations in the next three to five years. In 2016, the report identified the ability to evolve corporate culture as the deciding factor for organizations in the digital era.[8]

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"Digital means people too and a cornerstone of this year's Vision is people first," says Paul Daugherty[9], Chief Technology Officer at Accenture. "Companies that embrace digital can empower their workforce to continuously learn new skills to do more with technology and generate bigger and better business results."

Successful change management entails making a visible, long-term commitment at senior level, and thinking about who will use the digital solutions, how they will use them and, crucially, what will help them to recognize their value they deliver. Achieving that places tough demands on the skills of public sector organizations.

"Public sector organizations face a number of challenges that don't typically face the commercial sector," says Mongrand. "Government needs to make vital services accessible to all citizens, young and old, whatever their level of digital skill. In addition, public sector organizations typically have quite a high proportion of long-

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serving employees who are used to paper-based processes, and in some countries regulations still require a physical signature on a document. They need to make sure their applications are accessible on any device anywhere, whatever its screen size – whether that's a desktop computer or the latest tablet device. It's really important for agencies to understand who will use the digital capabilities, because if you just move to a digital process the technology won't necessarily be adopted for use. Transformation is a gradual process because changing the way people work takes time and it's important to get it right."

Working with trusted partners who have deep sector expertise enables government organizations to build the digital skills they need for successful transformation. Microsoft and its partners work with government organizations to profile end-user personas and demonstrate how digital processes can deliver value by driving efficiency and improving communication and collaboration between different personas.

PROFILED: IMPENDLE MUNICIPALITY

Building foundations for cloud-based continuity

Impendle Municipality, in the uMgungundlovu District of the KwaZulu-Natal province in South Africa, is mandated to provide basic service delivery to the community it serves. When it was confronted with failed audit findings on IT service continuity, it considered cloud computing as an alternative to the costly task of building infrastructure and creating a revamped datacenter, but it was not sure how to use the cloud for its requirements.

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The municipality has already invested in other Microsoft technologies, and it planned a pilot project using Microsoft Azure cloud services to see how the solution could meet its disaster recovery and business continuity requirements. It approached Microsoft, which then identified their Partner, Gijima as the implementation partner of choice to assist with the project.

Gijima planned, designed and implemented a simplified disaster recovery solution that would protect the critical workloads of the municipality in case of any disaster which could cause infrastructure outages. The key objective was to implement a consolidated platform that would provide Impendle with the capability to easily extend its data centre to Azure. Gijima also suggested implementing an Azure Site Recovery solution.

After a successful pilot, Impendle is now in the process of a full rollout. Ayanda Mkhize, senior ICT officer of the Impendle Municipality, says that lessons learned from the pilot gave Impendle the confidence and motivation to take the implementation to the next level. "The pilot helped us to run Azure in a limited environment to test the waters," he says. "While we initially had concerns around our hardware infrastructure, Gijima and Microsoft provided us with the assistance we needed to embrace Azure."

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6 HARNESSING DATA

"A lot of the data held by governments is public already, and moving it to the cloud can enable them to foster public-private partnerships to develop innovative services and apps

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M anaging increasing volumes of data in a way that enables intelligent insight for everyone who needs it is a challenge for any organization, and getting it right is at the heart of a truly seamless and efficient government service.

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Data is a subject that relates to several key transformation skills as government organizations face the challenge of collecting, storing and managing growing volumes of data in a secure and compliant way, and using it to generate the intelligence they need to provide better services, drive efficiencies and engage with citizens.

"Data is central to any discussion about transformation in government," says Mongrand, "The challenge for the public sector is often embodied by business process, regulation and bureaucracy, but a lot of the data they have can be moved to the cloud as long as it is managed correctly. Governments have a lot of field workers who traditionally have to go into the community with their paperwork, then back to the office to transfer details from paper onto the computer, taking a lot of time. If those field workers have devices and data intelligence, they can do their work much faster and more efficiently. In order to provide that seamless

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service, organizations need to handle a lot of data, to transform that data into insight, and to make sure it's secure and compliant, and accessible on any device. The cloud's elastic capacity and analytic capabilities enable them to do that. In addition, a lot of the data held by governments is public already, and moving it to the cloud can enable them to foster public-private partnerships to develop innovative services and apps."

As data collection increases, the need for public sector data skills grows. Microsoft and its partners provide the skills and technology to make this journey easier. For example, when the southern German City of Ulm wanted to involve citizens directly in joint decision-making on land use, it deployed an open-source solution on Microsoft Azure, providing a scalable platform to solicit feedback, inform citizens of updates, share answers, and generate a clear picture of public opinion. Microsoft partner

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Zebralog helped to provide essential skills the city needed for the project. "We combined our years of experience with online surveys and e-participation into a compact solution that offers great usability for all project participants," says Matthias Trénel, Managing Director of Zebralog. "By using a solution that takes advantage of Microsoft cloud technology, the city gains IT security and trust, ease of use, and, most important, scalability. To prepare, we held two workshops to show Ulm employees how to optimize the website for their use. It was that easy."

Building the intelligent cloud to suit the needs of the organization enables governments to take advantage of unprecedented processing capacity and use tools such as Microsoft Power BI and Cortana Intelligence Suite to make sense of a huge array of data sources, from facial recognition to sensor information from the internet of things (IoT).

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"Cloud computing offers the smallest organization or city government agency access to the same computing power as a large multinational company or national government ministry without having to invest in their own servers and large technology staffs," says [Alfonso Vegara](#), Founder and Honorary President of Fundación Metrópoli, writing on the Microsoft CityNext blog.[10] "And with access to basically unlimited computing resources at low cost, organizations can collect, mine, and process huge amounts of data to gain competitive advantages and large-scale efficiencies.

"As the data and insights they produce enable more elaborate and more ubiquitous conversations between citizens and the urban environment, cities that enable communication through a well-designed digital layer will have a distinct competitive advantage in attracting and keeping the global talent needed to build and grow knowledge economies."

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Gaining skills for a digital future

With a population of 1.3 million dispersed across a diverse terrain, Estonia prioritizes digitally enabled, self-service government. Mandatory ID cards enable citizens to log in and sign documents wherever they are, and less than 5% of government transactions are done on paper. "We are creating government as a service," says Taavi Kotka, CIO, Government of Estonia. "We are able not only to serve Estonians here, but also all Estonians around the world."

Estonia wanted to back up all its applications in the cloud, and it worked with Microsoft to make sure they were resilient against events such as

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cyberattacks and natural disasters. "Microsoft helps us from a scientific and research point of view," explains Kotka. "Applications that were built ten, or even five years ago were not built with the cloud in mind. It was a much more complicated task than we imagined, but we have to do it because we want to be able to run all the meaningful applications that the country needs in the cloud. We need to work with strong global players because they have datacenters all around the world. That's why we started our collaboration with Microsoft, to guarantee that whatever happens, our society is protected."

By working with Microsoft, the Estonian team was able to gain vital skills for its digital future. "We had to do a deep security assessment and a data classification assessment to really tease apart how the applications could be effectively ported and reconstructed on the cloud platform," says Bruce Johnson, Senior Director of Technical Strategy, Microsoft. "We were able to apply a lot of the techniques that Microsoft uses to develop its own software to be secure and resilient, and to work with the Estonian development teams to show them how to apply these same things when they're developing applications for the cloud."

7 EMPOWERING GOVERNMENTS TO TRANSFORM

“Government organizations are working with Microsoft to gain the skills they need to innovate at their own pace and deploy real-time solutions that can interoperate with their legacy IT investments

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Governments play a unique role in communities, providing vital services to citizens of all ages and administering critical public systems. As they embark on their digital transformation journey, they need the skills not only to enable the insight and flexibility that support proactive service, but also to ensure secure and compliant use of data, to build digital resilience and to minimize disruption.

Microsoft and its global network of partners have the technology skills and vast industry experience available to governments, as and when they need them, to help fill the growing demand for transformational skills. The Microsoft focus on delivering a trusted cloud and innovating productivity and mobility solutions is supported by a vast network of device, software and services partners, which empowers workers in every government organization to achieve more for the institutions, businesses and citizens they serve. Government organizations are working with Microsoft to gain the skills they need to innovate at their own pace and deploy real-time solutions that can interoperate with their legacy IT investments, enabling them to transform in a way that prioritizes flexibility, integration and trust.

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