

# Embracing digital government



# What's next in the transformation?

Leveraging **crowdsourced** solutions

Acting on **climate change**

Reinventing **citizen engagement**

Bridging **physical and digital worlds**

Achieving **continuous service delivery**

Delivering **faster, smarter** service

Advancing **human-centric** design



10101  
01010  
00100  
Data



Machine learning



Natural interfaces



Quantum computing

"Things"

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“A nexus of forces is changing all aspects of our lives. From the way we live, work, and interact with the world around us. As they become more interwoven into the world around us, digital technologies are disrupting the status quo of business and government. Governments need to redesign their structures and processes to capitalize on a new set of actors and tools.”

—Future of Government, World Economic Forum.

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Innovation and technology are key factors for governments in Canada as they move to create opportunities and transform lives to enable a mobile workforce, modernizing infrastructure with cloud technology, and getting new value out of big data. Microsoft firmly believes that technology has the power to enable every person and every organization on the planet to achieve more, and nowhere is this more important than in the public sector, where organizations exist to serve the public good.

This guide explores seven areas where we see technology innovations being used to transform government to address economic and social challenges. We hope it inspires new ideas and we look forward to partnering with you as you transform to a digital government.

# Leveraging crowdsourcing to drive citizen-centred government



Tracking hyper-local conditions



Collecting real-world insights



Using ideas and feedback from citizens

# When everyone and everything is connected, open data, open government and citizens themselves may become your greatest source of innovation.

*As part of the global open government movement, governments seek to broaden access to data and information, ensure transparency and accountability, and strengthen citizen engagement in the activities of government and in the democratic process. Canada has a longstanding commitment to openness and accountability as a cornerstone of a strong, modern democracy. From the passing of access to information legislation over 30 years ago to current open government and proactive disclosure activities, the Government of Canada has worked to ensure transparency on federal operations to enable Canadians to hold their government accountable."*

Source: Canada's Action Plan on Open Government

Data is the new currency and it is increasingly accessible and open to the public. In today's hyper-connected world, Canadians can mobilize and act faster than you can internally. How do you leverage that information to support decision-making in the public interest?

The vast growth of social and mobile technologies, combined with the cloud and the advent of big data, has created a technological shift that opens up a new world of innovative and data-driven solutions. Hyper-local data such as real-time weather or road conditions can be used to improve safety alerts or traffic routing. Real-world insights into product use, like pressure in an automobile tire, can influence the development of regulatory standards. Feedback and ideas from individuals can be mined at scale to improve everything from front-line service delivery in healthcare to network security.

Open government today can take advantage of crowdsourcing - gathering information where it lives and putting it to work building value to support responsible data-driven decision-making. This might be feedback gathered on social networks, data generated by users of a product or mobile device, or even the conversations that your employees engage in.

We've reached a tipping point where the massive adoption of mobile platforms and social media, combined with big data and advanced analytics, means that it's easier than ever to gather, sift, and convert these immense sets of crowdsourced information into action.

For the sixty-nine countries enrolled in the Open Government Partnership (OGP), the priorities identified can benefit by aligning technology with crowdsourcing so that governments can more quickly and effectively drive better outcomes against the following:

**Improving Public Services:** Fostering public service improvements or private sector innovation;

**Increasing Public Integrity:** Corruption and public ethics, access to information, campaign finance reform, and media and civil society freedom;

**More Effectively Managing Public Resources:** Budgets, procurement, natural resources and foreign assistance;

**Creating Safer Communities:** Public safety, the security sector, disaster and crisis response, and environmental threats;

**Increasing Corporate Accountability:** Corporate responsibility on issues such as the environment, anti-corruption, consumer protection, and community engagement.

The results can become a critical driver for your government or agency, improving your ability to be inclusive and responsive, and helping you launch new innovative initiatives that exceed your citizens' expectations.

But crowdsourcing is much more than getting feedback or running an Internet suggestion box. It's about successfully tapping into a new and expansive source of data, input and ideas to find insights and innovations you can turn into action. By using the power of the crowd in concert with flexible and robust platform technologies, you can turn this untapped resource into value for your citizens.

## Hamburg Port Authority

Hamburg, Germany, Europe's second-largest port, was caught between the growing needs of European trade and the space-constraints of the historic, scenic city. The Hamburg Port Authority (HPA) needed to develop systems to help make more informed decisions with split-second timing. They looked to Microsoft Social Engagement to allow them to gauge the opinion of citizens about the port in general to help resolve problems quickly and ensure higher service standards.

*"If you look at how entities and businesses must react to public opinion today, it's mandatory to monitor social media. Hamburg is our home too, and what the citizens say about us is important. Monitoring the print media is in these times not sufficient anymore, and from our point of view it would be a mistake not to monitor social media activities - it's a normal step if you take the digital revolution seriously."*

- Sebastian Saxe, Chief Digital Officer for the HPA.

# Reinventing citizen engagement

Transforming from aging systems  
to a connected,  
dynamic  
platform



Turning demand-  
driven insights  
into operational  
efficiencies

Streamlining  
processes to  
deliver localized,  
personalized experiences



# Transforming from process-oriented government to better serve Canadians.

*In today's world, the way we communicate between individuals and organizations is experiencing a complete digital transformation. Citizens now want immersive, relevant and connected experiences that leapfrog the stand-alone engagement approaches of yesterday. To deliver this new brand of citizen and client-focused communication, governments must reinvent how they engage with their constituents to optimize value, and improve client experience.*

Today's rising citizen expectations and rapid technology innovations drive the need for modern engagement approaches that are focused on citizens as clients. As a result, many leading governments are now reinventing their consultation processes for a mobile-first, cloud-first world. They are shifting from manual processes to digital automation, from being process-organizations to being service providers. How easily can you shift to embrace this new era of innovation?

Next, government can turn their sights towards streamlining processes to deliver localized, personalized experiences. By mapping citizen feedback to the natural workflows for program development, public sector organizations can eliminate waste and accelerate innovation towards the local, personalized experiences that most citizens crave.

Personalization also means implementing a clear identity management strategy. Just a decade ago, identity management was relatively simple. Governments managed their own servers on-premise, supplying employees with a username and password to access desktop computers. In those days, citizen access to online systems was rarely required. However, today we need to manage both internal and external users, making access requirements increasingly complex.

Today, identity management often involves monitoring access to a combination of on-premise and cloud-based applications and services as well as managing the identity of a proliferating number of devices that users bring to work. Therefore, it entails overseeing a broad network of citizens and other external users. Common areas of consideration include:

**Hybrid identity:** Hybrid identity provides an in-depth way for governments to manage user access to applications and other resources from a variety of devices across their datacentre and the cloud.

**Self-service and single sign-on:** Enabling staff and citizens to change and reset their own passwords.

**Multi-factor authentication:** Incorporate multiple layers of protection through multi-factor authentication, requires users to identify themselves in more than one way—for instance, by what they know, such as a user password, and by what they have, such as swiping a smartcard.

**Biometric authentication:** Add in user identification by what they are, through fingerprinting, facial recognition, and retina and iris patterns. Biometric authentication can safely and simply allow governments to protect the security of their information.

**Security reporting and monitoring:** Enable advanced monitoring and reporting to help monitor suspicious logon activity, obtain alerts, and mitigate potential security issues while obtaining suggestions for remediating any issues that are found.

Once the systems and processes are in place, civil servants are next turning demand-driven insights into action to adapt how they respond to citizens.

## City of Brampton

The City of Brampton wanted to make it easier for citizens to find information and engage with public services. After evaluating mapping technologies, the City integrated IDV Solutions' Visual Fusion and the Bing Maps Platform into the new Citizen's Service Portal (CSP). Now, CSP users can find what they need from road closures, zoning bylaws, schools; and internal users in every city department can efficiently provide up-to-date geographically based information in real-time.

The abundance of data available today presents a number of new opportunities for public sector organizations to improve their level of interaction with citizens. Elected officials and civil servants can use demand-driven insights to become responsive to what's working, and refine their approaches accordingly.

At Microsoft, we offer the productivity solutions and platforms that enterprises need to reinvent engagement approaches and transition from a process-led approach to a service-driven government. Our flexible cloud products are powering the public sector as they transform their processes and systems into the digital era. Our unique business intelligence products deliver the insights elected officials and civil servants need to make faster, more accurate decisions. Most importantly, our commitment to security enables us to help protect governments, agencies and the public as they undergo their digital transformation.

Microsoft telehealth solutions reduce delays in care delivery, serve patients outside of hospital and emergency-room settings, and access expert clinical diagnostic resources across multiple environments and settings, delivering a much lower cost per capita while improving patient outcomes.

# Growing sustainably



Operating lean facilities



Acting on climate change

Ensuring accountability with a carbon fee

carbon fee™



# Operating in a lean, green, and accountable way while growing our economy is an increasing priority for governments.

Canada has traditionally benefited greatly from its natural capital – an abundance of natural resources and ecosystem. As the nation transforms to seize the opportunity of digital enablement, its citizens look to government to help protect from the challenges of climate change without sacrificing growth and prosperity.

Microsoft is committed to a carbon neutral strategy that is rooted in three core principles: be lean by reducing energy use (in our offices, datacentres, and labs) and air travel through technology-driven efficiency; be green by making more environmentally responsible choices with our energy, waste and water; and be accountable by quantifying our carbon impact and holding groups responsible. Across these, we are using technology to help us grow our business sustainably. Our corporate commitment helps reform our work to improve the environment through the delivery of solutions to customers around the world.

Today we collect more than 500 million data transactions a day and use technology to prioritize fixes, balancing the cost in terms of money and energy being wasted against the impact that it will have on employees. As project manager Darrel Smith remarked, *“smart buildings will become smart cities, and smart cities will change everything.”*

*To build energy efficient buildings, you have to take into account what happens around the building, in the neighborhood,”* said Gillaume Parisot, Head of Innovation, Bouygues-Immobilier. *“It is an innovative realization of an energy management system by multiple players and shows that the development of smart grids is really a challenge and opportunity for local businesses.”*

There’s no doubt that technology has become a critical part of how organizations operate. As the carbon footprint to power datacentres continues to multiply, renewable energy options can help reduce the environmental impact of technology. Sourcing technology from carbon neutral cloud providers can be an effective alternative to expanding private data centre capacity. With the massive investments required to take advantage of emerging technologies like machine learning and artificial intelligence, working with a commercial cloud provider that has made a commitment to being carbon neutral not only helps you reduce your own footprint, but also ensures that you don’t simply transfer your footprint to your suppliers.

Microsoft will soon have two new datacentres in Canada, operating with the same carbon neutral commitment that governs our global footprint of datacentres around the world.

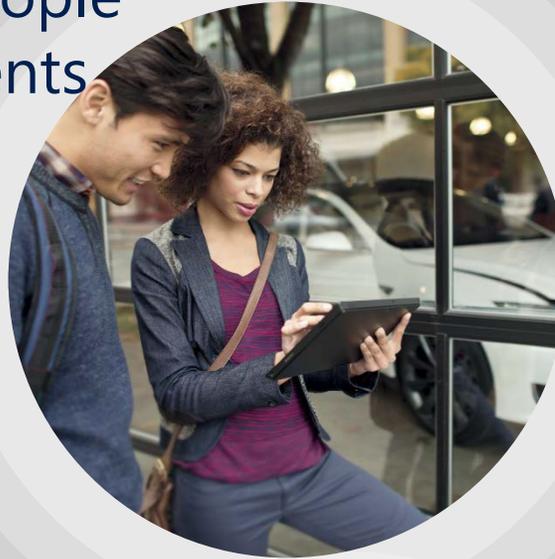
## IssyGrid

In France, IssyGrid is a bold experiment in seeing what happens when homeowners and building owners are empowered with real-time data on their energy usage. The result: they reduce their consumption and their energy bills—by 10 to 20 percent. This exciting project is led by a consortium of business leaders and uses Microsoft’s public cloud resources to store data and Microsoft’s data management software to analyze it and yield insight.

# Bridging digital and physical worlds



Engaging people  
in the moments  
that matter



Advancing  
information  
sharing and digital  
exploration

Delivering new  
efficiencies through  
connected intelligence



# Mobility and the Internet of Things are ushering in a new era of connected intelligence.

*Today's mobile and wearable devices provide more computing power than what is used to launch the Apollo space missions or even the space shuttle. Combine these capabilities with the virtually unlimited computing power in the cloud and experience how mobile technology and the Internet of Things (IoT) can bridge digital and physical worlds to usher in a new era of connected intelligence.*

IoT, the cloud and mobility play a pivotal role in reinventing engagement approaches by enabling public sector organizations to rapidly transform from aging systems to a connected, dynamic platform. For example, program managers can now quickly provide services directly to clients by empowering their staff with the highly secure, connected platforms they need to quickly access the latest information.

Using a combination of sensor IoT technology and real-time insights increases uptime, which means on-demand citizen service. The flexibility of the cloud makes it possible and simple to prototype and test new processes quickly, accelerating the implementation of new applications.

But many organizations are still wondering how to make the promise of IoT a reality. What are some of the ways leaders are using mobile and wearable devices and the IoT to usher in a new era of connected intelligence, and how can governments leverage what others are doing?

Engaging people in the moments that matter is one of the first ways governments are applying mobility to deliver real benefits to their citizens and employees. Governments that can deliver unique digital experiences that promote deeper engagement will win with better and more cost-effective programs and innovative initiatives, resulting in higher levels of citizen satisfaction.

Citizen engagement is only one component of the digital transformation, however. Delivering new efficiencies through connected intelligence is also taking centre stage as governments and agencies explore the use of smart machines, mobile devices, and wearable products to transform services, putting in place the devices and machines that deliver improved performance anywhere.

Engagement, mobility, cloud are also driving greater needs around security. Microsoft is helping governments meet their security obligations for privacy and data protection in a cloud-first, mobile-first world. Experienced in running online services for almost 30 years means that Microsoft has invested extensively in foundational technology that builds security and privacy into the development process. Over time, Microsoft has developed industry-leading security measures and privacy policies, and participated in international compliance programs with independent verification of how we measure up.

*"We don't have the resources to respond to security threats all day, 365 days a year, the way that Microsoft does."*  
- Bo Wandschneider, CIO and Associate Vice Principal  
Queen's University (Canada).

## The Canadian Broadcasting Corporation / Radio-Canada (CBC)

The Canadian Broadcasting Corporation/Radio-Canada (CBC) as a trusted source for election results decided to build a responsive app that would work across mobile and desktop to provide real-time election results in English and French during the Federal Election of 2015. To achieve high performance, large scalability to provide modern multi-channel application, CBC turned to Microsoft's Azure and leveraged the App Service environments to scale their infrastructure across three different geographical regions close to 1,300 computer cores to serve over 3.6 billion requests over a period of six hours with peaks of over 800K requests per seconds.

# Trusted cloud principles

## Commitment to principles worthy of your organization's trust

### Security



Fundamentally, a desire for easier and faster access to new insights and services still resides at the centre of the digital transformation. Advancing information sharing and digital exploration is now one of the primary roles of mobile devices and emerging technology products. Schools can transform learning by using mobile technology to deliver lessons, implement peer-to-peer collaborations, and communicate with educators. Elected officials can connect more closely to citizens and civil servants using new devices and services. New mobile breakthroughs can remove obstacles, such as helping visually impaired people safely navigate their surroundings or enabling citizens to participate in council or committee meetings remotely.

### Privacy & Control



Seamless mobile experiences that unite physical surroundings with digital services open up new opportunities for governments to serve citizens in new ways.

At Microsoft, we offer the mobile-first, cloud-first solutions necessary to bridge digital and physical worlds. Helping governments build on their existing technology assets, devices, and data to derive value from the Internet of Things (IoT) is a cornerstone of Microsoft's vision for the future. Our mobility solutions enable fluid, seamless mobile experiences that deliver instant access to data and applications anytime, anywhere. Our flexible cloud platform empowers government to quickly respond to changing needs and meet citizens' rising expectations for engaging experiences.

### Compliance



### Transparency



## Transport for London (TfL)

London commuters using open data and cloud services to innovate and increase resilience.

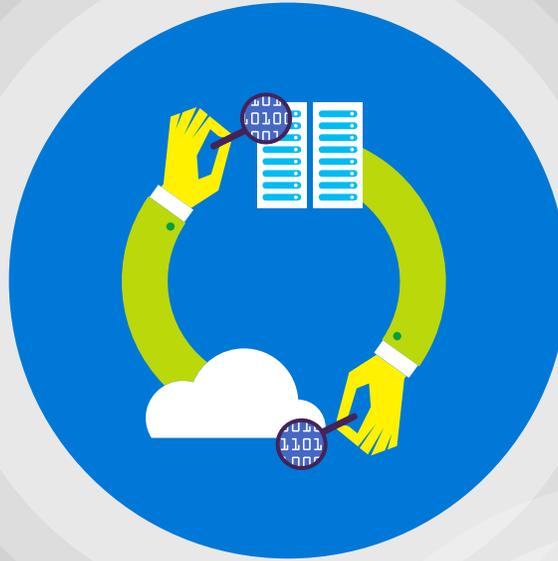
Since 2011, Transport for London (TfL) has worked with Microsoft to use London's available open data to provide better services to its customers—whether they are on the rail or on the road. Even with bad weather and major events in London, the Microsoft cloud scales to meet the spikes in demand without increasing the strain on the TfL server. Open data is also used in the bicycle rental program, ensuring that, at any particular time, customers know where bicycles are available in the city.

The partnership has also resulted in the continuous addition of innovative solutions, including most recently contactless payment for travellers on the London Underground. As such, these innovations support not only greater ease of use for transit riders but also increased security and resiliency, enabling them to be successful.

# Achieving continuous uptime

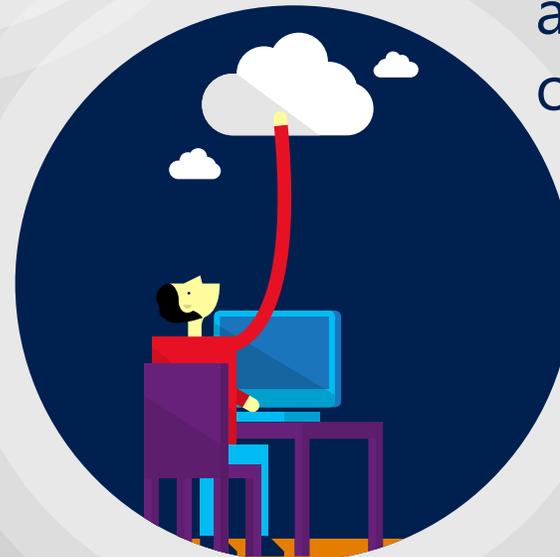


Taking a predictive approach to maintenance



Connecting sensors and machines with operational systems

Servicing and calibrating remotely through the cloud



# Cloud platforms are making “always-on” a reality.

*Today's systems produce a wealth of data from sensors, devices, equipment, and line-of-business systems. By putting this data to work, governments now have the opportunity to achieve unprecedented levels of uptime and efficiency.*

Technology is approaching a new crossroads where streams of data from connected systems are being used to revolutionize maintenance, resourcing, and operations. With the continuing refinement of cloud technology organizations are increasingly connecting their systems to transform their operations.

Microsoft is delivering solutions today that enable you to monitor assets and use data to improve efficiency, drive operational performance, and help keep your systems running. From embedded systems to networking, data storage, and analytics, not to mention a worldwide network of technology partners and implementers, Microsoft is well placed to provide solutions today. The Microsoft solution is cloud enabled from the start, providing reliable, scalable services whether across the data centre floor or the global enterprise.

Continuous uptime, powered by the cloud, is becoming a reality today. By harnessing the data produced inside and outside of the organization, governments can create intelligent services that are more efficient, flexible, and responsible to their communities.

## Tax Authority of Mexico

Tax Authority of Mexico Improves Interaction with Taxpayers through Cloud Computing Services

The Tax Authority of Mexico (SAT) wanted to upgrade its technology infrastructure to serve the growing demands of 40 million taxpayers. SAT shifted to the Microsoft cloud, to improve online service levels for citizens and businesses, increase tax control and tax collection, and reduce processing time and tax evasion.

*“We went from handling 9.5 billion electronic invoices between 1997 and 2012 to a total of 10 billion between 2013 and 2014,” says Juan Manuel Galarza, Tax Authority of Mexico, General Administrator of Communications and Inform. “And we predict that we’ll process 7 billion electronic invoices during 2015 alone.”*

# Advancing human-centric design



Personalizing experiences with artificial intelligence



Translating in real-time



Making computing interaction more natural

# Technologies that recognize, understand, and respond to humans and the world around them will revolutionize how we live and work.

From the mouse to the touch screen to voice-activated personal assistants, the technologies we use in work and life every day haven't stopped evolving. Now a new generation of technologies is emerging that has the intelligence to provide interactions that are truly natural and instinctive.

As digital technologies become even more ubiquitous and easy to use, we're continually finding new ways to enhance productivity and open up new digital experiences. However, natural human interactions are still at the centre of what we do. Social networks are an extension of how we interact socially. The tools we use at work and in our daily life are oriented towards familiar activities, such as learning, communicating, and creating. Human-centric design takes the growth of technologies like machine learning, natural language processing, and visual recognition, and uses them to make existing digital experiences more intuitive while opening up new ways of using computers we had not imagined before. With computing now so ubiquitous, human-centric technologies are transforming how we live—not just when we're on a smartphone or a PC, but everywhere.

The next generation of human-centric technologies is already achieving these goals. By personalizing experiences with artificial intelligence, our tools can make our work and life easier. Imagine a smart phone that can visually recognize the food you're eating and provide you with nutritional information, or deliver medical information based on a photograph of a skin rash.

Imagine a service kiosk that can recognize a face and provide personalized service. By translating spoken languages in real time, such as during an online meeting or phone call, you can communicate in places you never could have before. And by making computing interactions more natural, you will simplify how citizens and civil servants benefit from technology to find answers or deliver services.

In his first email to Microsoft employees, CEO Satya Nadella wrote about leading into the future of natural human-computer interfaces to empower every individual. Microsoft has continued to deliver on this promise with technologies like the Cortana digital assistant and Delve, a new service in Office 365 that uses knowledge from your work and interactions with colleagues to present you with relevant information. Microsoft Kinect motion sensors allow people to interact with games and software through gesture without need for a mouse or keyboard. Skype Translator is on the leading edge of multi-lingual software, piloting the ability to translate in real time between English and Spanish, with more languages to follow in the future. Power BI in Office 365 today offers the ability to frame data queries in natural language. And Microsoft Research is continuing to advance machine learning and artificial intelligence.

There has always been a strong drive to make interactions with computers easier and more streamlined. Human-centric computing continues this trend by moving towards a future where hardware and software remove barriers and enable people to realize their goals.

## Humber River Hospital

When Humber River Hospital, Canada's first all-digital hospital opened its doors in October 2015, Microsoft was front and centre, playing an integral role in patient point-of-care solutions. Humber River Hospital is able to deliver efficient, patient-centered point-of-care solutions by providing every patient with access to a Microsoft Windows touch-screen device featuring an Integrated Bedside Terminal (IBT) that connects them to their medical teams and the outside world. Patients can Skype home to family members, search the internet, watch movies, read books or listen to the radio. Patients can also place their menu order or call a nurse.



Humber River Hospital  
featured on  
Intelligent Hospital TV.

Delivering  
faster, smarter  
service



Using mobile  
apps to deliver  
customer  
service  
everywhere



Constantly improving  
products and services



Responding to  
customer needs  
before they ask

# Today's client-focused governments are using technology to deliver service that's personalized and natural without delays.

Your citizens expect fast, personalized service, and they won't hesitate to tell you if they aren't satisfied. How do you earn the trust of today's citizens when they have access to more information than ever before?

Many government organizations are embracing a trend to use new methods to deliver services that are laser-focused on the client, driving success by understanding, predicting, and fulfilling citizen needs faster and more effectively than ever before. They're doing it by using digital technology to renew and transform how they serve clients. But faster, smarter service isn't just about doing a better job of resolving issues, it's about embracing a client-centric model from end to end, providing highly personalized, relevant citizen experiences across every touch point and interaction.

But how do you go about providing the highest level of service across every channel with no queues, wait times, or delays? One way is to use mobile apps to quickly get the right information at the right time. For example, citizens could use mobile devices to deliver 311 information back to officials. Tree removal, flooding, power outages, etc. can be relayed by the person who is at the scene as it happens. Immediate acknowledgement of the request and interactive maps showing service dispatch and wait times cuts back on multiple calls into public sector call centres.

Delivering these kinds of solutions requires technologies that work naturally together, whether on a mobile device, back-end servers, or in the cloud. It begins with bringing together data from client databases, back-end servers, mobile apps, and client-facing systems. Combine this with business intelligence and cloud services to make sure you can deliver information and insights to clients and employees when and where they need it. With big data, machine learning, and predictive analytics you can take it one step further, anticipating client needs and fulfilling them proactively. Microsoft is well positioned to deliver on this promise with cloud-enabled, mobile-ready productivity and business solutions that span the cloud, desktop, and devices.

Microsoft Research has also been working on the cutting edge, developing the next wave of customer-facing technologies, such as algorithms that can predict consumer behaviour. One recent project uses real-time diagnostic data from elevators to deliver riders to their destination faster and detect maintenance issues before they result in an outage. When clients are empowered by social and mobile technologies and access to information, they are happier with their elected officials and public servants. That's why we're focused on giving you solutions that help you build strong, long-lasting relationships with your citizens.

## Elections Saskatchewan

Elections Saskatchewan was faced with an outdated, hard to use, and inconvenient website and database. Adxstudio Inc. and Brown Communications Group were able to provide Elections Saskatchewan with a new, leading edge website that was seamlessly integrated with Microsoft Dynamics® CRM Online and helped voters find polling stations in two easy clicks using the constituency locator and Bing maps. The interface was designed to provide voters with all the information they needed to vote. Built for growth, Elections Saskatchewan's website was able to scale to 33,000 page views on election day.



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