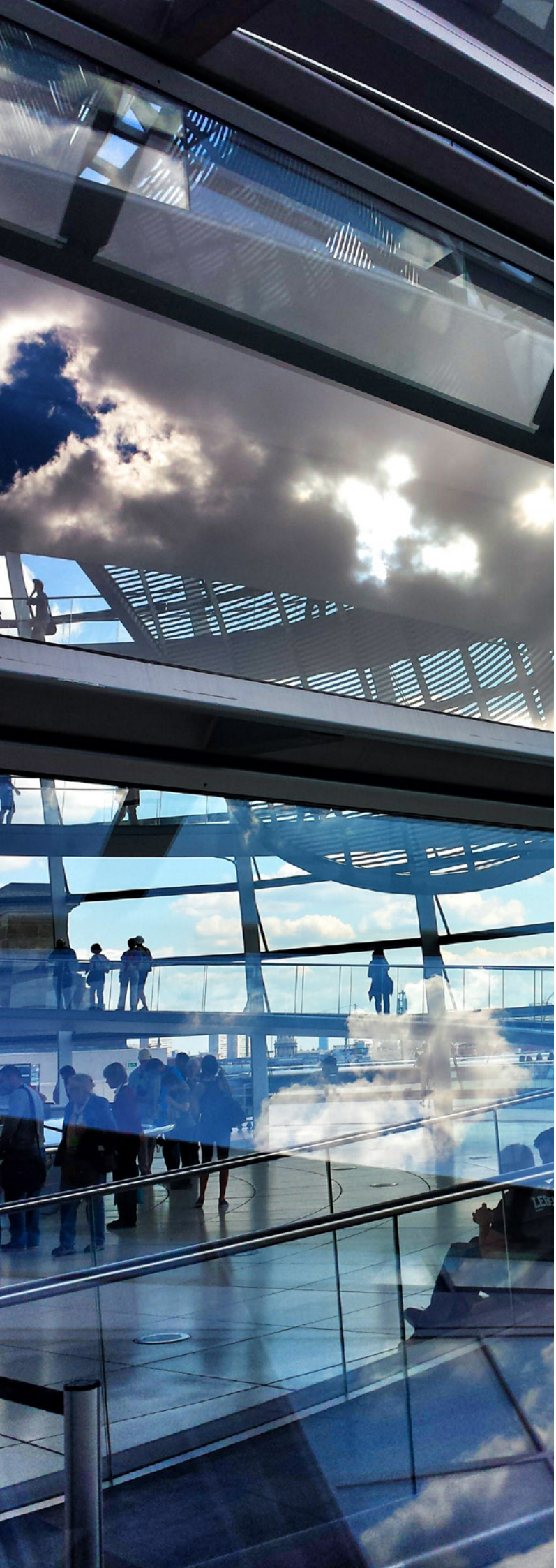

Research Insights

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Building a Cognitive Enterprise: Nine Action Areas for Government

Core Concepts Australia and New Zealand

IBM **Institute for Business Value**

IBM

This Core Concepts Australia and New Zealand document is abridged from the in-depth version, “Building the Cognitive Enterprise: Nine Action Areas, Deep Dive” that also contains full-length case studies.

Accelerating your digital transformation for the new normal

We are at a tipping point in history where the impact of technology is so significant it can completely transform the way businesses and governments function. The convergence of exponential technologies such as artificial intelligence (AI), Internet of Things (IoT), blockchain, and 5G provides the opportunity to rethink how organisations are structured, how services are delivered, and the way humans work alongside technology. This reinvention is what IBM calls the Cognitive Enterprise™.

Add the extraordinary challenges that Australian and New Zealand organisations are experiencing with current global uncertainties, and nearly every sector is facing significant disruption. For government departments and other public sector agencies, these new challenges add to existing ones – such as meeting citizens' rising expectations and managing increasing demand for services with limited resources.

Disruptive events don't necessarily bring new changes, but they do accelerate the pace of change already underway. COVID-19 is no exception. And one particular change has become patently clear: digital technologies are now part of an organisation's – and a nation's – critical infrastructure. So those technologies need to be flexible, scalable, and resilient.

This report explains how to build platforms with digital technologies that meet these criteria – and that help organisations meet their challenges. These new, value-creating platforms include transformative, intelligent workflows and offer a new user experience for citizens and employees. In short, the report reveals how any organisation – including federal, state, and local government organisations – can become a Cognitive Enterprise.

While many organisations had already embarked on digital transformations, the COVID-19 pandemic has made the need for change much more urgent.

Accelerating your digital transformation for the new normal

Public sector challenges

COVID-19 changed the world overnight and this has had a profound impact on the public sector. Businesses, schools, and other organisations closed their doors. While many have reopened or found ways to continue operating remotely, the economy is still facing significant challenges. And governments are responsible for providing support. At last count, for example, the Australian Government's JobKeeper program was supporting 3.5 million workers.[1] The New Zealand Government's COVID-19 Wage Subsidy has supported more than 1.7 million workers.[2]

The healthcare system is under pressure like never before – ranging from workers responsible for contact tracing and modelling the impact of the virus, to the doctors and nurses on the frontline. Meanwhile, other government agencies, councils, universities, and schools have had to make quick, critical decisions to protect employees, citizens, and students, while continuing to provide vital services at a time when many people most need them.

All of this has resulted in huge surges in demand for government services. That demand was already increasing before the pandemic, due to greater access to services via digital channels and ambitious programs such as Australia's National Disability Insurance Scheme. But the immense pressures and demands on the public sector during the pandemic have accelerated the rate of change. Programs that previously would have taken years to get off the ground were implemented in weeks.

However, scaling services to meet demand is a challenge. For example, the relief programs for last summer's Australian bushfires required thousands of additional workers to process applications and payments.

Since then, demand for government services has reached extraordinary heights. The MyGov website was hit with a huge spike in traffic soon after the pandemic started, as thousands of Australians sought help from Centrelink. As a result, the government has had to ramp up the website's capacity from 6,000 concurrent users to 300,000.[3] Agencies have continued to be inundated with interactions ranging from welfare applications to enquiries about COVID-19 testing.

Deciding how to change

Government organisations have not been standing still. Digital initiatives such as the Australian Taxation Office's Single Touch Payroll and myTax portal have alleviated specific issues. However, they don't necessarily solve a key challenge: how to broadly scale government services in a sustainable and cost-effective way at a time when budgets and resources are tight.

The solution: a broadly-based front-office to back-office transformation that will deliver the fast, efficient government services that citizens expect – and robust digital platforms that they can rely on. Such transformations start with setting a goal.

From the start of the pandemic, IBM offered Watson Assistant for Citizens for no charge for at least 90 days and assisted with the initial set up, which could typically be done in a few days.

La Trobe University, a public research institution based in Melbourne, Australia, needed a way to communicate critical information about the university's pandemic resources to its students – so looked quickly to take advantage of the offer and engaged the IBM Garage to help it develop a virtual advisor based on Watson Assistant to supplement its existing COVID-19 resource site, ensuring information was synthesised and available to its students really quickly. La Trobe also lays claim to being the first organisation in the southern hemisphere to migrate to a SaaS student information service and enjoys partnering with innovative organisations.

Working together with IBM Garage, the organisation established remote teams, and within two weeks had created a minimum viable product (MVP). Using IBM Watson Assistant, La Trobe expanded on a previously delivered IBM Garage project, the Bachelor of Arts Explorer,[3] which is a discipline evaluation site that uses Watson AI services and IBM Cloud to deliver predictive responses that map student queries about majors to potential careers.

Needing to give Academic researchers better tools, La Trobe is breaking from traditional legacy systems through the articulation of a research centric user experience with their Project for Research Information Management enablement, PRIME. La Trobe University deployed a first of its kind Salesforce solution to streamline its entire grant and research management practice, inclusive of, grant opportunities, research activity and progression, through to measurement of impact and success of their research outcomes.[4]

Driving change from the inside out

Effective digital initiatives like the above are underpinned by fundamental technological and cultural change. And the latter is still the biggest challenge facing many government agencies. Leaders are struggling to engage their wider organisations and transform them in meaningful and sustainable ways. They need help working out how to get started and then scale, identifying which execution and funding vehicles to use, and deciding how to orchestrate the complexity of the change.

IBM helps organisations solve these issues by taking a new, platform-centric approach to digital transformation.

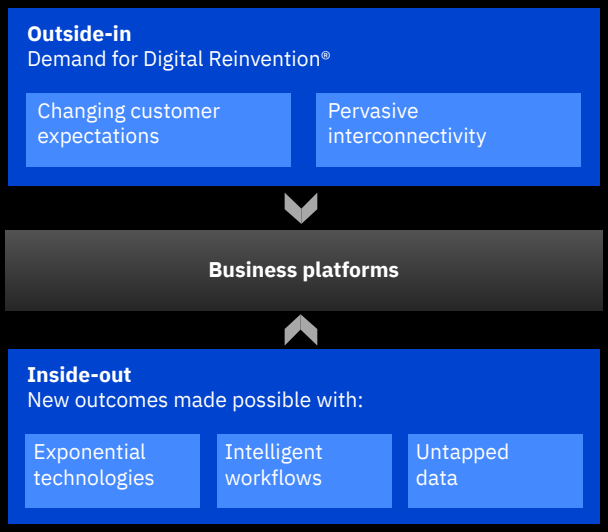
For much of the past decade, organisations have been striving for "outside-in" digital transformations. Government agencies, for example, have been connecting themselves more deeply to citizens and other external stakeholders such as businesses and other public sector organisations.

Today, IBM is helping organisations build on these capabilities by driving "inside-out" transformations (see Figure 1). This approach is enabling them to unlock the power of their data through new technologies that offer exponential gains, such as AI, blockchain, automation, IoT, 5G, and edge computing.

Figure 1:

The platform-centric business model

As organisations attempt to navigate the market, the next era of business reinvention emerges with platforms at its heart.



IBM is helping organisations that are combining these two forces in a new wave of change and structuring themselves around reimagined business platforms. IBM calls them business platforms because they encompass processes and the way people work, as well as data and technology, enabling fundamental change in both private and public sector organisations.

These platforms are not just a place for proof of concept or outlier projects. They are core to how an organisation functions and interacts with citizens and other stakeholders.

> Platforms must be massively digitally connected from the outside-in and fully cognitively enabled from the inside-out.

Three key components

The journey to becoming a Cognitive Enterprise starts with data and the technologies that allow teams to extract its full value. Those insights are then used to create smarter workflows. But success depends on human interactions and capabilities. For government organisations especially, it's vital to enrich employees' skills and create deep, trusting relationships with citizens.

The problem for many leaders is knowing how and where to start, as they struggle to escape from the complexity of early innovation endeavours.

Having worked with many leading public sector organisations, IBM has identified three key components that underpin this new platform-centric organisational model:

1. **Market-making business platforms –** the North Star for the expenditure priorities and change initiatives needed for sustainable success, these focused, critical platforms can leverage data in new ways to create value for citizens, policy makers, and other stakeholders.

2. **Intelligent workflows –** these are extended end-to-end or front-to-back processes that, through the application of technology at scale, define the citizen experience and economic outcomes at the heart of the new business platforms, and clearly differentiate the organisation.

3. **Enterprise experience and humanity –** these initiatives extend citizen experience to the employees who serve those citizens, the organisation itself, and the entire ecosystem to provide a seamless environment of value and purpose using human-centred design.

The Cognitive Enterprise demands a new kind of leadership, emboldened by deep technology insights, and new skills and culture to embrace this exponential potential. Perhaps the biggest challenge and opportunity will lie in the capacity to make the necessary changes in the pools of expertise, mindsets, and ways of working to bring this vision to life.

The Cognitive Enterprise framework

Within the three components are nine action areas that IBM sees as critical to creating a framework for success (see Figure 2).

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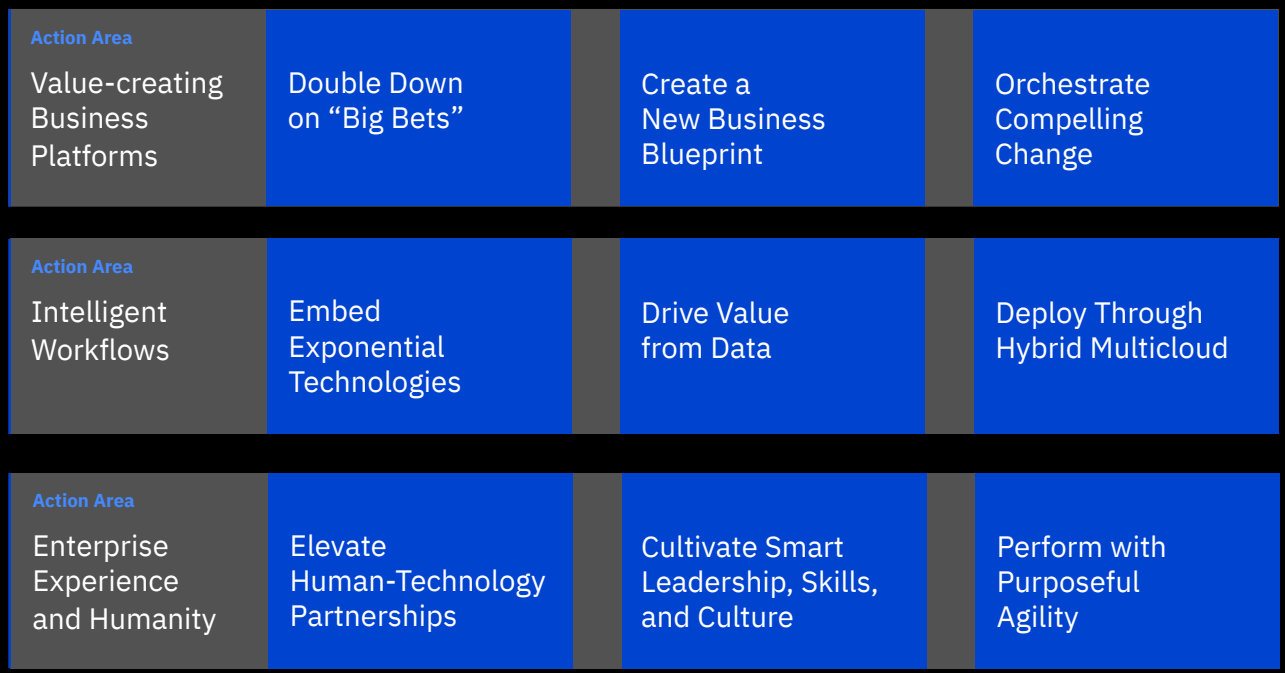
Figure 2:

Nine action areas for creating a framework for success



Action Areas to build Value-creating Business Platforms

1. Value-creating Business Platforms

Cognitive Enterprises are built on new business platforms that can leverage data in new ways to create value for citizens, policy makers, and other stakeholders.

These value-creating business platforms can form the basis of a future operating model, comprising a set of services that can be owned, orchestrated, or outsourced to achieve the organisation's objectives. They are designed around people, cognitive workflows, internal and external data, and technology. They allow organisations to leverage exponential technologies to meet the growing complexity of citizen demand, societal change, and regulatory needs – at the same time ensuring that digital infrastructure is secure and resilient.

To establish value-creating business platforms, organisations need to instil new rigour and focus to move beyond experimentation and balance stability with agility.

For government agencies, it starts with building an open primary platform, which is centred around the organisation's core strategy, acts as connective tissue with ecosystem networks and technologies, and gets smarter over time through AI. The primary platform also has supporting platforms for tasks such as back-office processes and applications that interact with third parties.

Many of these platforms are designed to leverage internal data. After all, an estimated 80 per cent of the world's data remains proprietary.[5] Other platforms, however, straddle organisations and industry boundaries.

One such platform is Lygon. Backed by a consortium including ANZ Bank, Commonwealth Bank, IBM, Scentre Group and Westpac, Lygon is a new digital platform that uses blockchain technology to transform how businesses obtain and manage bank guarantees for property leases. The platform includes standardised process and contracts, along with an updated legal framework underpinning digital contracts. It reduces the risk of fraud, and decreases the potential for errors. And the speed is exceptional – in the Lygon pilot using real customer data, what used to take up to a month took less than a day to process.[6]

To build value-creating business platforms like this, organisations need to:

— **Double down on "big bets"** – choosing a platform likely to deliver results and aligning the organisation, assets, resources, and investments to rapidly scale and then evolve the platform

— **Create a new business blueprint** – embedding governance in a more open and transparent way to inform decisions made at the edge of the business, and reconfiguring organisational components to create a new target operating model

— **Orchestrate compelling change** – establishing "control towers" to monitor early warning indicators, orchestrate change in real time, and develop iterative and proactive change management.

These platforms need solid technology foundations that require organisations to embrace cloud, modernise legacy systems, and optimise access to data and information.

Government organisations also need access to appropriate citizen data so they can tailor services the way people increasingly expect. However, to do that organisations need to gain citizens' confidence and trust in how their data is used and protected.

A survey by the Australian National University's Centre for Social Research and Methods found that most Australians would support the government using citizens' data for some purposes, such as allocating resources to those who need it the most. However, more than 70 per cent were concerned about the accidental release of personal information, hacking of government systems, and data being provided to private sector organisations.[7]

Clearly, government organisations have a challenge ahead to win citizens' trust. Achieving this requires transparent, permission-based value exchanges between organisations and citizens, along with governance controls to ensure data is used responsibly. However, citizens' confidence in government systems can be improved by using AI for security automation, to reduce breaches.

TradeLens:
Rules for a global shipping platform

TradeLens is driving a wave of change made possible by cross-industry collaboration. This open shipping platform, underpinned by blockchain technology, was launched to help digitise and modernise the world's supply chain ecosystems. It now comprises more than 100 different organisations and is on target to handle more than half of the world's ocean container cargo.[8]

The platform, developed by Maersk and IBM, lays the foundation for digital supply chains. It empowers multiple trading partners to collaborate – publishing and subscribing to a wide range of supply chain data – by establishing a single shared view of a transaction without compromising details, privacy, or confidentiality.

A few big rules or guiding principles govern how the platform will operate and expand, as well as how participants will interact and derive value.

First principle: TradeLens is an open, neutral platform available to any permissioned party to a shipment, anywhere in the world. All authorised participants can immediately contribute to and extract value from the TradeLens platform.

Second principle: The platform enforces a standard data sharing and permission model that governs which parties to a shipment provide data and which parties are granted access to that data. Sensitive information, such as trade documents, remains under the control of the providers across a distributed network of blockchain nodes. The model promotes greater transparency, makes data more widely available, and ensures security and protection of sensitive data.

Third principle: The platform maintains an open API environment, employs standards, and promotes interoperability as the foundation for ongoing improvement and innovation. A marketplace will allow third parties as well as participants to build and deploy applications on the platform.

As a single platform connecting the entire ecosystem for secure data-sharing and collaboration, TradeLens brings value to cargo owners, freight forwarders, rail, trucking, ports and terminals, ocean carriers, customs and other government authorities, and financial services. All parties benefit from seamless, secure sharing of real-time, actionable information, empowering the participants to streamline their supply chains and mitigate problems through predictability and exception handling.

Using intelligent security automation to reduce threats

If the journey to becoming a Cognitive Enterprise starts with data, protecting that information is crucial – particularly for financial institutions, whose customers have high data security expectations. That can be a challenge given the sudden increase in remote working and digital footprints.

The cost and risk of a cybersecurity breach are increasing each year. According to the Ponemon Institute's 2020 Cost of a Data Breach Report, the average cost of a data breach in Australia was A$3.35 million per breach, a 9.8 per cent increase from 2019. Eighty per cent of these incidents exposed customers' personally identifiable information – and it took an average of 211 days for businesses without security automation to identify and contain a breach.[9]

However, organisations can reduce these risks. Businesses that had fully deployed security automation technologies – such as those using AI, analytics, and automated orchestration to identify and respond to security events – experienced less than half the data breach costs than organisations that did not have these tools. Organisations with security automation were also able to respond to breaches more than 27 per cent faster than those that didn't have it.

Action Areas to create Intelligent Workflows

2. Intelligent workflows

Value-creating business platforms are built on new and dynamic workflows that connect front-office and back-office processes end to end. These intelligent workflows are transformed by exponential technologies – including AI, blockchain, and IoT – that use multiple data sources to generate insights that can help improve processes and allow employees to make better and more timely decisions.

Intelligent workflows are vital for enabling government agencies to scale quickly and sustainably. They can allow government leaders to become more responsive to change and enact policy changes much more quickly. Intelligent workflows can also facilitate much higher levels of low-touch or even no-touch processing, shortening response times and improving the citizen experience.

For example, the New York City Human Resources Administration has transformed how citizens apply for benefits, such as supplemental food assistance. Using IBM technology, the organisation has streamlined the application process via the ACCESS NYC portal and other channels, including self-service kiosks throughout the city. The system guides applicants through the process and supports seven languages and special services for the visually impaired.[10]

As well as addressing cost challenges, intelligent workflows enable value-creating business platforms that provide near real-time responses. For example, IBM is helping public sector organisations adopt intelligent workflows in their contact centres to deliver faster, more tailored citizen services and improve the employee experience, while driving efficiencies.

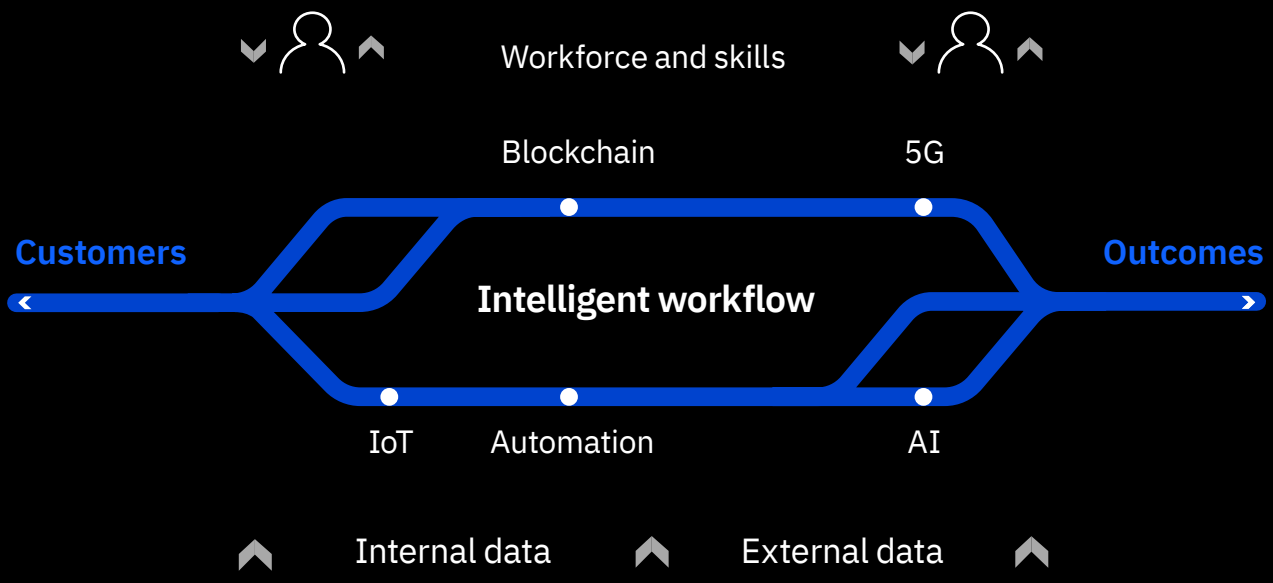
IBM is also helping organisations use intelligent workflows that can enhance next-generation enterprise software, such as SAP S/4HANA and Salesforce, by adding functions and value to these applications' core processes.

To create intelligent workflows, organisations need to:

- **Embed exponential technologies to change ways of working** – building highly dynamic workflows with multi-functional teams that can work in parallel, iteratively, and with autonomy to unleash exceptional productivity and innovation (see Figure 3).
- **Drive value from data** – using the most valuable information and establishing robust governance to build trust in data and AI models so decisions can be pushed out to the organisation's frontlines.
- **Deploy platforms through hybrid multicloud** – enabling them to unlock more data from new and legacy solutions, and put it to new uses in intelligent workflows and modernised applications.

Figure 3:

Exponential technologies embed intelligence into workflows



Intelligent hybrid multicloud solutions

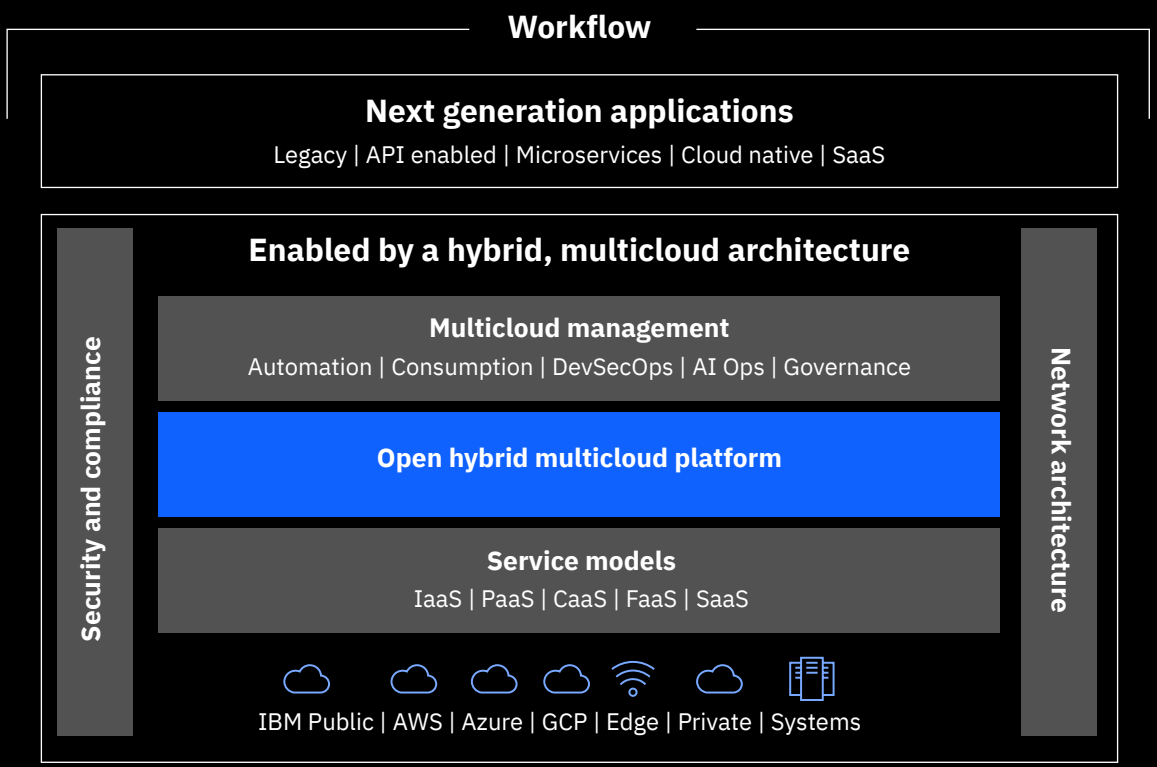
Cognitive Enterprises, with their value-creating platforms and intelligent workflows, can be fundamentally enabled by hybrid multicloud infrastructure. Hybrid cloud architectures straddle on-premises systems, private clouds, and public clouds. They can combine the capabilities of the cloud with legacy systems.

Intelligent workflows can have an assortment of underpinning enterprise applications, varying implementations of embedded exponential technologies, and evolving data architecture needs. Each of these can be enabled by a hybrid cloud environment.

One major problem for many organisations is understanding how to modernise legacy systems, which they often do in a piecemeal and limited way. However, enabling intelligent workflows at scale requires a broader architectural change (see Figure 4). Only by migrating to hybrid, multicloud environments will an organisation's infrastructure have the flexibility and agility to support intelligent workflows.

Figure 4:

Dynamic orchestration with hybrid multicloud drives flexibility and speed



IBM helps public sector organisations through the modernisation process by following five key tenets, ensuring their infrastructure becomes:

— **Hybrid**, leveraging the breadth of IBM's experience in migrating and modernising infrastructure across hybrid environments;

— **Multicloud**, through partnerships with leading public cloud platforms and IBM's Cloud Innovate Toolkit, which accelerates the migration across multicloud environments;

— **Open**, with portability built into the migration process through legacy application containerisation and techniques that use cloud vendor-specific and open source tools;

— **Secure**, with security a top priority and inherent in the migration and modernisation design and delivery;

— **Seamless**, ensuring tight integration using management and monitoring tools across multicloud environments.

As well as supporting other leading public cloud providers, IBM offers its own open, secure public cloud service. It's supported by a global network of more than 60 data centres and six multizone regions. The network includes Australian data centres certified by Australian Signals Directorate.

In addition, IBM is working on a new generation of cloud services for organisations with common operational criteria. For example, IBM recently launched the IBM Cloud for Financial Services, a significant milestone in IBM's collaboration with Bank of America. And with IBM Cloud Policy Framework for Financial Services, it offers streamlined industry-specific compliance controls, allowing financial services organisations to operate securely with bank-sensitive data in the public cloud.

Only by migrating to hybrid, multicloud environments will an organisation's infrastructure have the flexibility and agility to support intelligent workflows.

Action Areas to advance Enterprise Experience and Humanity

3. Enterprise experience and humanity

Ultimately, the success of these next-generation applications – and the platforms themselves – hinges on their human interface. Organisations need to create a new enterprise experience. In other words, agencies need to ensure employees, citizens, and other stakeholders have highly responsive, relevant, and richer interactions across the organisation. Doing this requires seamlessly applying AI and other new technologies for the people who use and benefit from them, while also cultivating an agile culture.

The Cognitive Enterprise requires a new kind of leadership, emboldened by deep technology insights and new skills and culture to embrace the potential offered by exponential technologies. Perhaps the biggest challenge and opportunity to bring this vision to life lies in the capacity to make the necessary changes in the pools of expertise, mindsets, and ways of working.

While an "inside-out" transformation is crucial to becoming a Cognitive Enterprise, it's essential that the organisation maintains an outside-in focus on delivering citizen, customer and employee experience and value. The entire organisation needs to be connected from top to bottom through dynamic and AI-enabled business processes, unpinning next-generation applications and core services, and running on secure cloud environments.

To create a new enterprise experience, organisations should:

— **Elevate human–technology partnerships** – embedding the enterprise experience everywhere; reshaping the citizen, customer, employee and ecosystem partner experience; and establishing a human-centred design.

— **Cultivate smart leadership, skills and culture** – developing leaders who have a combination of business and technology acumen, who can redeploy skills to support intelligent workflows, and who can create a culture that fosters continuous learning.

— **Perform with purposeful agility** – enabling the organisation to move quickly to reinvent its core and optimise value and time to market, while avoiding "agile chaos."

When it comes to skills and culture, three-quarters of the leading organisations in IBM's Global C suite Study recognise something that others don't: that employees don't just need new skills to be comfortable working with data; they need new tools.

That need is now more urgent, as the pandemic accelerated citizens' use of digital channels and technologies. In fact, a recent study found that 75 per cent of people using digital channels for the first time indicate that they will continue to use them when things return to "normal."[11]

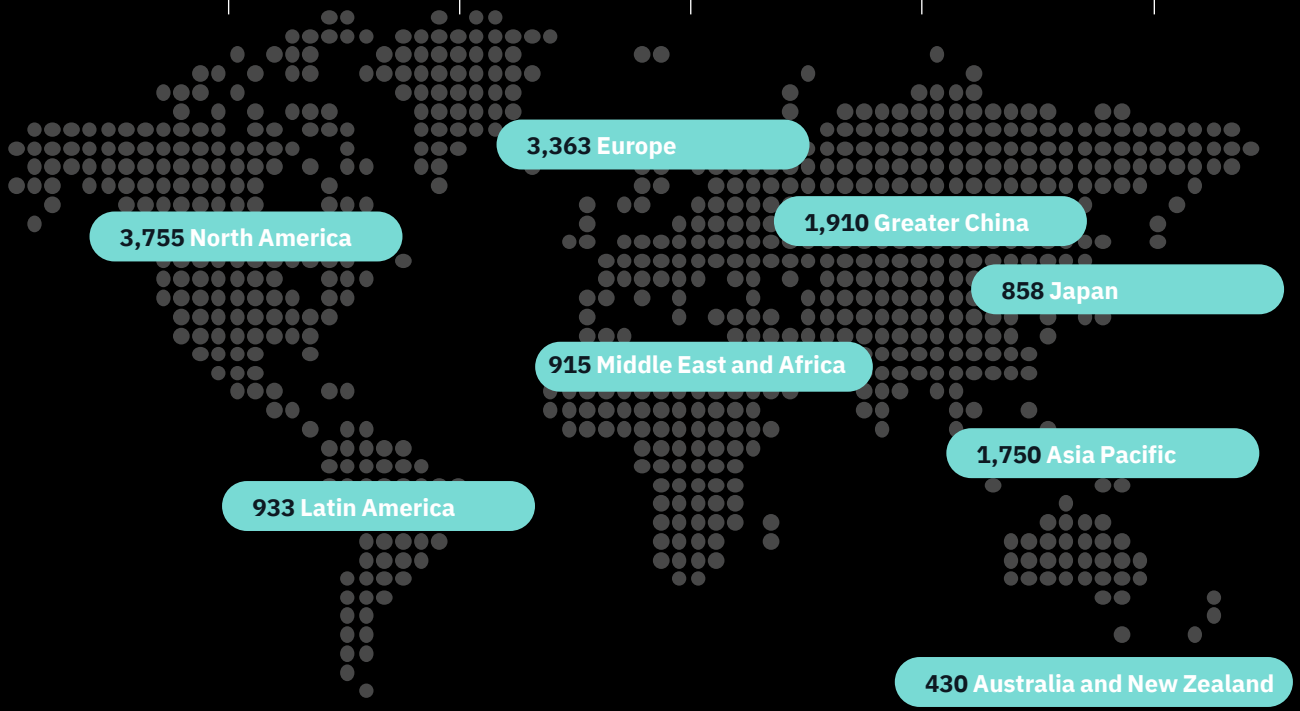
The pandemic has also highlighted the importance of employees having the right skills to support the accelerated digitalisation of public sector services. IBM can help with Your Learning, a personalised learning platform that enables employees to regularly update and add to their skillsets. IBM Garage takes this approach further by embedding a culture of continuous learning throughout the organisation.

Creating the trust advantage

A key attribute of Cognitive Enterprises is that they foster a culture of trust in data. The IBM C-suite Study for Australia and New Zealand has highlighted that organisations that have truly learnt to trust their data drive better business outcomes. Clearly, when important processes, decisions, and customer and stakeholder interactions rely on automation and algorithms, the requirement for trust is vital. In Australia and New Zealand, 92 per cent of leading organisations – those that excel at extracting value from data – have a singular focus on how they use and safeguard data to strengthen customer trust.[12]

The IBM C-suite Study draws on input from 13,484 respondents – including 430 in Australia and New Zealand – across six C-suite roles, 20 industries and 98 countries.

69	67	90	80	64	60
Chief Executive Officers	Chief Financial Officers	Chief Human Resources Officers	Chief Information Officers	Chief Marketing Officers	Chief Operations Officers



New way of building: IBM Garage

IBM has created a new approach to digital transformation called IBM Garage. The Garage is designed to help organisations move at the speed of a startup and become Cognitive Enterprises.

In the Garage, IBM experts can help public sector organisations develop new business platforms, operating models, architectures, and citizen experiences at greater pace and lower risk – and benefit from continuous learning.

Start-up speed. Enterprise scale.

The Garage provides the perfect vehicle for building a Cognitive Enterprise. It can help to define and build business platforms, reinvent and re-engineer intelligent workflows, and create an enterprise experience in which the humanity of the organisation is able to fully take advantage of the power of exponential technologies. The Garage can have a durable position in the full lifecycle of business change, from co-creation to co-execution, while also enhancing co operation. And it can help organisations measure speed to value and the rate of organisational change.

— **Co-create to envision the future –** Uncover a new opportunity to add value or drive critical new insights into an existing situation. Ideate with the organisation's entire ecosystem, or with relevant smaller squads, to co-create a visionary, compelling, and energising citizen experience that fits within clear architectural guide bars.

— **Co-execute to build out and scale up** – Expand and create additional squads to build out the team that will realise the future vision. Develop the minimum viable product prototype into a first production-ready release and find a product market fit. At the same time, be ready to improve solutions based on what's learnt from users and scale up rapidly with robust architectures and prepare to scale into full production.

— **Co-operate to iterate and continuously improve** – Keep sharpening and hardening tools, architecture, and reliability, while monitoring and testing for continuous improvement. This leads to continuous delivery that is crucial to deeply transform the organisation's culture. Much of the work can be done with distributed squads throughout the enterprise.

IBM Garage is transformation that organisations can see. The work and outcomes are transparent and on display for the whole enterprise to witness. It starts small, with one initiative, and squads and executives learn by doing the work. When the Garage creates new value, it's designed to scale. Garage brings the behaviour and characteristics of a startup – speed and a human-centred focus – to an enterprise.

Working in the IBM Garage is about each squad finding their own purpose, mastery and autonomy – united by their product strategy and vision. Squads are made up from the best person for the job in each problem area. This is a unique aspect of teaming in Garage. Squad members are cross-functional teams who can come from all areas of government, service providers and business partners. It's this diversity of thought that leads to better outcomes and a better experience for employees.

The experience of working and delivering in the IBM Garage is measured by how quickly the squads deliver value and the organisation's rate of change and adoption of new ways of working.

The Garage provides the perfect vehicle for the building of the Cognitive Enterprise. It can help to define and build the market-making business platforms, reinvent and re-engineer the intelligent workflows, and create the enterprise experience where the humanity of the company is able to fully take advantage of the power of the exponential technologies at its heart.

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For more information

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