GOVTECH: Championing Singapore's Digital Government Journey

GOV**TECH**
SINGAPORE

Today, **94% of all citizen and business** transactions with the Singapore Government can be completed digitally from end-to-end – this covers a host of activities from birth registrations to reporting municipal issues.

To date, the Singapore Government has more than half of its relevant systems hosted on the Cloud through the Government on Commercial Cloud (GCC) platform, helping public agencies to build and deliver digital applications for citizens in a faster and more scalable way.

Such achievements today are the fruit of a continuing Digital Government journey that started decades ago with Singapore's National Computerisation Programme in the 1980s that heralded the beginning of computerisation in the Government.

Read more ⟶

Singapore is now recognised internationally as a leading Digital Government.

• The World Bank GovTech Maturity Index (GTMI) ranked Singapore as one of the global leaders in Digital Government.

• Singapore ranked 1st in the IMD-SUTD Smart City Index 2021.

• Singapore ranked 2nd in the Waseda-University-IAC World Digital Government Rankings 2021.

• Singapore ranked 8th in the Economist Impact's Digital Cities Index 2022.

• Singapore ranked 11th in the United Nations E-government Survey 2020.

Singapore continues to break new ground and add to the Government's capabilities to develop and deploy tech for the public good – as witnessed during the COVID-19 pandemic.

GOVTECH
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Singapore Digital Government Journey

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The Role of GovTech

Singapore's Digital Government push is driven by the **Government Technology Agency (GovTech)**, working closely with the **Smart Nation and Digital Government Office (SNDGO)**.

Formed in 2016, GovTech has the mandate of developing technology for the Government, as well as building and strengthening the Singapore government's internal engineering and digital capabilities. Since then, the agency has empowered the Whole-of-Government (WOG) with tools and solutions to centrally design, develop and deliver digital services that are built for our citizens' and businesses' immediate needs.

In 2017, GovTech and SNDGO formed the **Smart Nation and Digital Government Group (SNDGG)**. Reporting to the **Prime Minister's Office (PMO)**, SNDGG is overseen by a Ministerial Committee led by Senior Minister Teo Chee Hean in his role as Chairman, and includes the following members:

• Josephine Teo, Minister for Communications and Information, and Minister-in-charge of Smart Nation and Cybersecurity

• Dr Janil Puthucheary, Senior Minister of State and Minister-in-charge of GovTech

• Dr Vivian Balakrishnan, Minister for Foreign Affairs

• Chan Chun Sing, Minster for Education and Minister-in-Charge of Public Service

GovTech's Engineering Capabilities

Currently, GovTech has more than 3,000 staff (as of July 2022), of which 85% are technically trained.

Almost 1,000 engineers support GovTech's work across three main areas – Products and Engineering, Services, Cyber and Governance. GovTech is also the sector lead for cybersecurity in the Government, and the Government Chief Information Security Officer sits in GovTech.

In addition, GovTech's Deputy Chief Executive Chan Cheow Hoe is concurrently the Government Chief Digital Technology Officer (GCDTO). The GCDTO serves as the head of profession for ICT engineers and the digital technology advisor to the Government.

He leads the development of the Government's digital infrastructure, and capability and talent development in information and communication technology and smart systems. He also oversees the development of platforms to enable resource sharing and interoperability across the Government, to drive the development and delivery of innovative government digital services for citizens and businesses.

Developing and Attracting Engineering Talent

To deliver Digital Government, it is paramount to have the right capabilities within the Government to adopt the 'Think Big, Start Small and Act Fast' philosophy to seize new opportunities in a fast-changing world.

GovTech thus aspires to attract the best multidisciplinary tech talent to contribute to Singapore's digital services. The strategy is to nurture talents with the right technological expertise through various programmes and channels to build long-term expertise to pursue innovation.

For example, GovTech is the **Centre of Excellence for Infocomm Technology and Smart Systems (ICT&SS)** for the Government. In this role, we have established five capability centres to train and develop a dedicated team of technical specialists.

The five **Capability Centres** cover these domains:

- Application Design, Development & Deployment

- Cybersecurity

- ICT Infrastructure

- Data Science & Artificial Intelligence


- Sensors and Internet of Things

GovTech develops capabilities within the Government in multiple ways. This includes building an in-house reserve of deep technical skills in areas where internal capabilities are needed to deal with highly complex issues on short notice.

Across the Government, GovTech helps to raise the capabilities of ICT practitioners and leaders, and also trains public officers in relevant broad-based ICT skills (e.g. basic awareness of data analytics) through the Digital Academy by GovTech.

The COVID-19 pandemic showed the effectiveness of this strategy. Singapore's ongoing drive to enhance tech capabilities within the Government allowed us to pivot quickly and develop digital tools for nationwide contact tracing, and the safe re-opening of Singapore's economy.

GovTech's Three Main Areas of Work
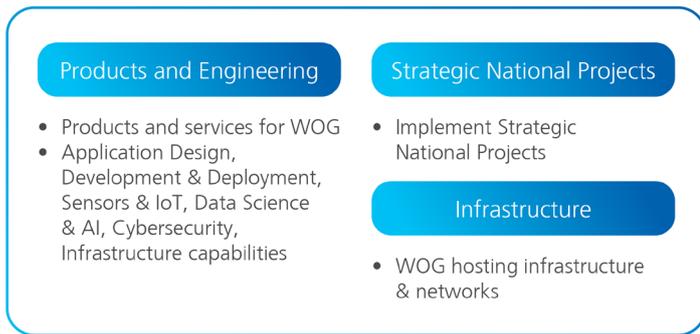
Products

Products and Engineering
- Products and services for WOG
- Application Design, Development & Deployment, Sensors & IoT, Data Science & AI, Cybersecurity, Infrastructure capabilities

Strategic National Projects
- Implement Strategic National Projects

Infrastructure
- WOG hosting infrastructure & networks

Services

Agency IT
- CIO & technology officers in 60 government agencies

Cyber & Governance

Cyber Security
- Chief Information Security Officer for Government sector

Governance
- Sets ICT policies covering whole of Government

Products

• Almost 1,000 in-house developers in GovTech who develop products for citizens, businesses and WOG, and spearhead the Strategic National Projects (SNPs).

• The team also manages the WOG digital infrastructure, migration to commercial cloud (Government on Commercial Cloud), data centres and the deployment of digital devices across the government.

Services

• Making up more than half of GovTech, the Services group deploys officers to over 60% of public agencies to design and build digital platforms and services, for their digitalisation efforts. While these officers are located in their respective agencies, they are GovTech officers. This enables us to ensure better planning of their professional career pathways and coordinated deployment of central platforms and products.

Cybersecurity & Governance

• GovTech is the sector lead for cybersecurity in the Singapore government. Hence the Government Chief Information Security Officer (GISO) is housed within GovTech.

• To ensure the safety and security of the Government's digital structures, GovTech's Governance group sets WOG information and communications technology (ICT) policies and guidelines.

Supercharging Whole-of-Government Digital Capabilities

Developing a digitally-skilled public service is essential for a Digital Government.

This is the mission of the Digital Academy by GovTech, a "Practitioner-for-Practitioner" academy that operates at the unique intersection of technology and public service. Established by GovTech for the public service, the academy's mission is to groom future-ready digital leaders to be well-versed in the current and future technology landscape to accelerate the public sector's digital transformation.

Public officers can benefit from a robust suite of ICT programmes that are contextualised to the public service, anchored on GovTech's Functional Competency model and aligned with the WOG Digital Maturity framework.

These include programmes in data science and analysis, Artificial Intelligence (AI), app development, design thinking, technical product design and management, and more.

The Digital Academy seeks to raise the digital literacy of public sector leaders and officers by:

• Deepening their ICT skills to achieve digital excellence in various innovation pillars, such as agile development, data science and AI, cybersecurity, sensors, Internet-of-Things (IoT) and more.

• Equipping them with the necessary knowledge and skills required to deliver digitalisation outcomes and lead digital transformation in their agencies.

• Enabling them to be digitally confident by building up their capabilities.

To date, over 2,000 public officers officers have attended 154 courses at the Digital Academy since June 2021 to equip themselves with the necessary skills.

Strategic National Projects (SNPs)

There are nine SNPs which are key enablers in Singapore's Smart Nation drive. They enhance the ability to deliver Digital Government services effectively.

GovTech drives some key projects while also developing products and solutions in collaboration with other government agencies.

These projects include:

NATIONAL DIGITAL IDENTITY:
THE SINGPASS FAMILY OF PRODUCTS

Singpass, the National Digital Identity (NDI) initiative, provides a convenient and secure platform for users - both citizens and businesses - to transact with the Government and other private service providers.

Today, Singpass highlights include:

• A user base of more than 4.5 million users.
• Serving approximately 97% of Singapore Citizens and Permanent Residents aged 15 and above, making it one of the most pervasively adopted national digital identity systems in the world.
• Providing convenient and secure access to over 2,000 services from more than 700 government and private sector organisations.
• Facilitating about 350 million personal and corporate transactions every year.

SMART NATION SENSOR PLATFORM

SMART NATION SENSOR PLATFORM (SNSP)

The SNSP is an integrated, nationwide platform that uses sensors to collect essential data that can be analysed to create smart solutions. It provides products and services across the Government for collecting, sharing, and analysing sensor data, as well as managing IoT and robotics systems.

SNSP projects include tracking water leakage across districts using wireless sensor networks, and a smart lamppost platform with sensors that collect data on air quality, rainfall and footfall for urban planning.

Moments of Life

MOMENTS OF LIFE (MOL)

The MOL family of products delivers relevant and essential services to citizens, businesses and public officers at key life stages. These include:

LifeSG

- **LifeSG for citizens and residents**

The LifeSG app provides easy access to a plethora of end-to-end Digital Government services,

news and updates, tracking of applications and more.

For example, every childbirth in Singapore today is registered digitally through LifeSG. New parents can perform the birth registration application, open a Child Development Account with banks and apply for the Baby Bonus scheme through the app instead of going to different agencies.

What took an hour previously can now be completed within 15 minutes using LifeSG.

Users can easily explore and access more than 100 Digital Government services on LifeSG. The information displayed is grouped according to topics of interest, such as family and parenting, work and employment, healthcare, housing and property, and other frequently-used digital services. More services will be added progressively.

To date, the LifeSG app has been downloaded more than 1.2 million times.

• GoBusiness for entrepreneurs and businesses

Whether it's starting, running or growing a business, GoBusiness is the must-have resource for entrepreneurs and businesses in Singapore.

GoBusiness transforms the way businesses interact with the Government, by providing businesses with integrated, personalised and seamless access to business information and services.

Jointly developed by the Ministry of Trade and Industry (MTI), SNDGO and GovTech, the GoBusiness platform serves as a single, reliable Government touchpoint for businesses at every stage of their journey. Through GoBusiness, one can easily access more than 300 government e-services from various government agencies.

This includes the most updated business regulatory information and personalised business recommendations on the platform, such as:

• Business registration
• Licence applications
• Recommendations on government support schemes
• COVID-19 regulations and applications

• Digital Workplace (DWP) for public officers
The Digital Workplace (DWP) comprises a suite of productivity tools and digital enablers designed to create a borderless, seamless and collaborative working environment for public officers – enhancing the daily work experience and helping them to be more productive at work.

• **Form.sg**: Form.sg is an online platform that lets public officers create official digital forms – including surveys, registration forms and questionnaires – for citizens to respond to.

• **CalSync**: Public officers can now sync their calendars on their personal devices through the CalSync app for Outlook, allowing them to view their work calendars on the move.

• **Workpal app**: Specially designed for public officers, Workpal is the single mobile front-end for public officers to access their employee and workplace services, such as applying for leave, submitting claims, booking rooms and managing visitors – anytime, anywhere. It also provides a digital business card.

CODEX

• Core Operations Development Environment and eXchange (CODEX)

CODEX is a shared digital platform that helps government agencies and private sectors to develop better, faster and more cost-effective digital services. The Singapore Government Tech Stack (SGTS) is one of the key components of CODEX. The other components include the Government Data Architecture and the GCC service.

CODEX, being scalable and reliable, offers an easy way for the public and private sectors to share reusable digital components, including machine-readable data, middleware and microservices.

Soon, 70% of the applicable workload of Government Digital Services will be hosted on the Cloud through GCC.

CODEX:
ENABLING A LEAN, AGILE AND FUTURE-READY GOVERNMENT

Services and Applications

SG Tech Stack

Cybersecurity
"Security-by-Design" approach for more productive, resilient and secure systems

Standards & Tools
Guidelines to ensure consistency across all applications and services

Library of Micro-Services
- Reusable common services that agencies utilise to build applications such as the National Digital Identity for authentication

Middleware
- Software services (such as API gateways and analytics tools) that allow for rapid development, deployment, testing & monitoring

Hosting Platforms
- Infrastructure-as-a-Service, using commercial cloud where possible, with secure connectivity for agencies' use

Data
- A Government Data Architecture outlining common standards and formats, enabling easier data sharing between agencies

• Singapore Government Tech Stack (SGTS)

SGTS provides government agencies and partners who develop solutions for the Government with a common suite of tools and services on a shared infrastructure, allowing for faster application development and quality maintenance within the Government.

Part of the CODEX shared digital platform, SGTS seeks to modernise development practices across the Government to help build secure systems that are responsive to the constantly evolving needs of citizens and businesses.

Government agencies can leverage SGTS' suite of tools and services hosted on a common infrastructure, enabling the developers to focus on building high-quality applications.

SGTS also offers a continuous integration and delivery (CI/CD) platform with the use of an Applications Programming Interface (API) Gateway known as APEX. The stack includes productivity tools and common services such as payment and authentication solutions.

Over 200 systems from 40 government agencies in Singapore have already reaped the benefits of SGTS by implementing their services or applications on the cloud. These include time and cost savings allowing them to focus on the services and applications instead of building cloud architectures.
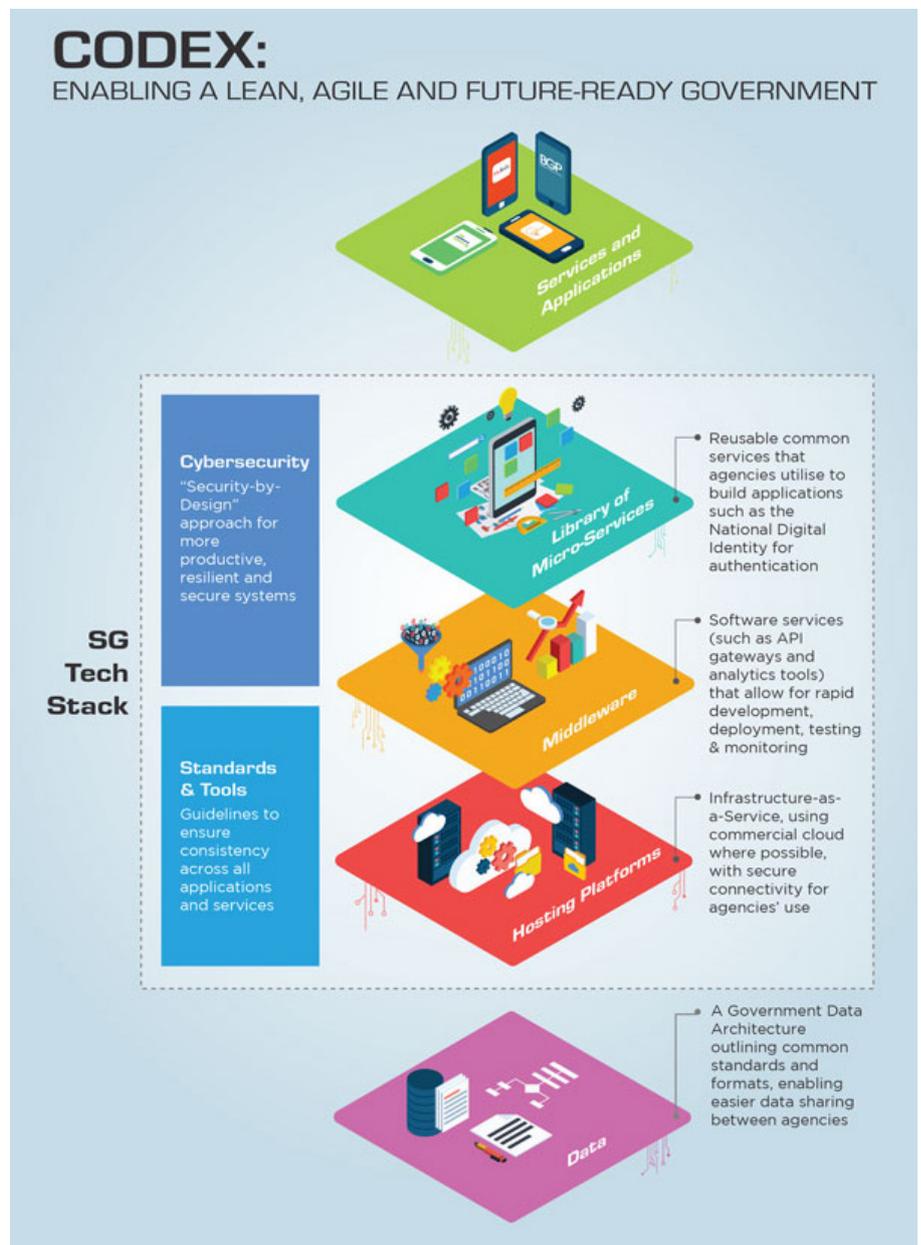
Leading Digital Government AI innovation

GovTech is also aligned with Singapore's National AI Strategy, working with the National AI Office in SNDGO to fully harness the benefits of AI for the country.

Singapore's National AI Strategy aims to:

• Identify areas to focus attention and resources at the national level.

• Set out how the Government, companies, and researchers can work together to realise the positive impact of AI.

• Address areas where attention is needed to manage change and/or manage new forms of risks that arise when AI becomes more pervasive.

It envisions that by 2030, Singapore will be a leader in developing and deploying scalable, impactful AI solutions in key sectors of high economic value and relevance to our citizens and businesses.

The Strategy, led by the National AI Office, focuses on seven key areas: healthcare, border security, smart estates, education, logistics, finance and government. As a national effort, the public and private sectors together with research institutions – are working to enable effective deployment of AI solutions.

On the Digital Government front, GovTech has been collaborating with other agencies to develop cutting-edge public sector AI applications in Singapore that serve the general public.

SAFE DISTANCE @ PARKS

In 2020, during the first year of the COVID-19 pandemic, GovTech worked with NParks over several months to develop an AI-powered system called Safe Distance @ Parks that was created and deployed using input from multiple video streams and relevant car park occupancy data. The system was used to determine near real-time crowd sizes at green spaces across Singapore, and parkgoers could use the information displayed via the Safe Distance @ Parks website or app to avoid areas with high footfall.

The people-counting solution was built on the foundations of GovTech's ongoing efforts and existing platforms for video analytics and cloud systems. Safe Distancing @ Parks helped NParks to reduce the number of staff deployed to manually count park visitors. It also enabled

NParks to reduce the manpower specifically deployed for safe distancing measures in parks by two-thirds, amidst acute manpower constraints during the pandemic.

Additionally, the solution developed and refined for Safe Distance @ Parks has become part of a suite of image and video analytics products provided by GovTech's Video Analytics System (VAS) platform. The VAS is a centralised and scalable cloud-based video analytics platform for the public sector.
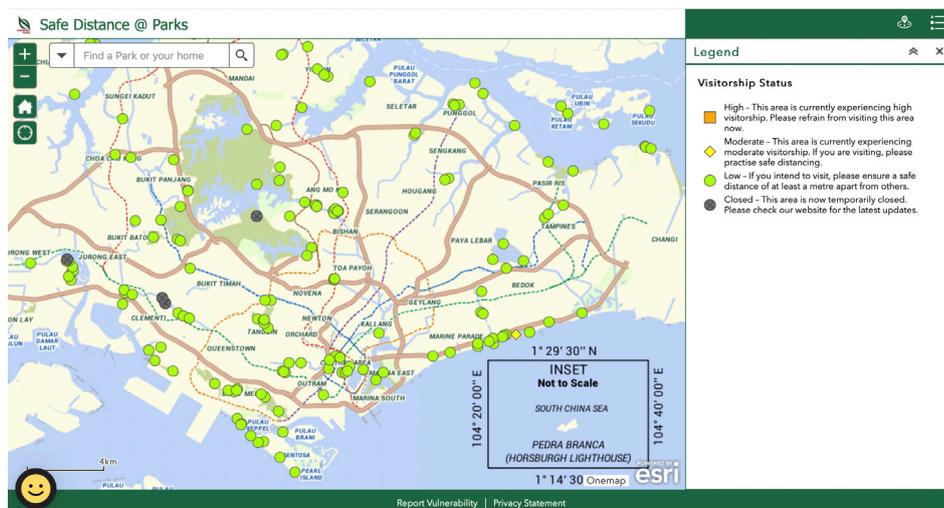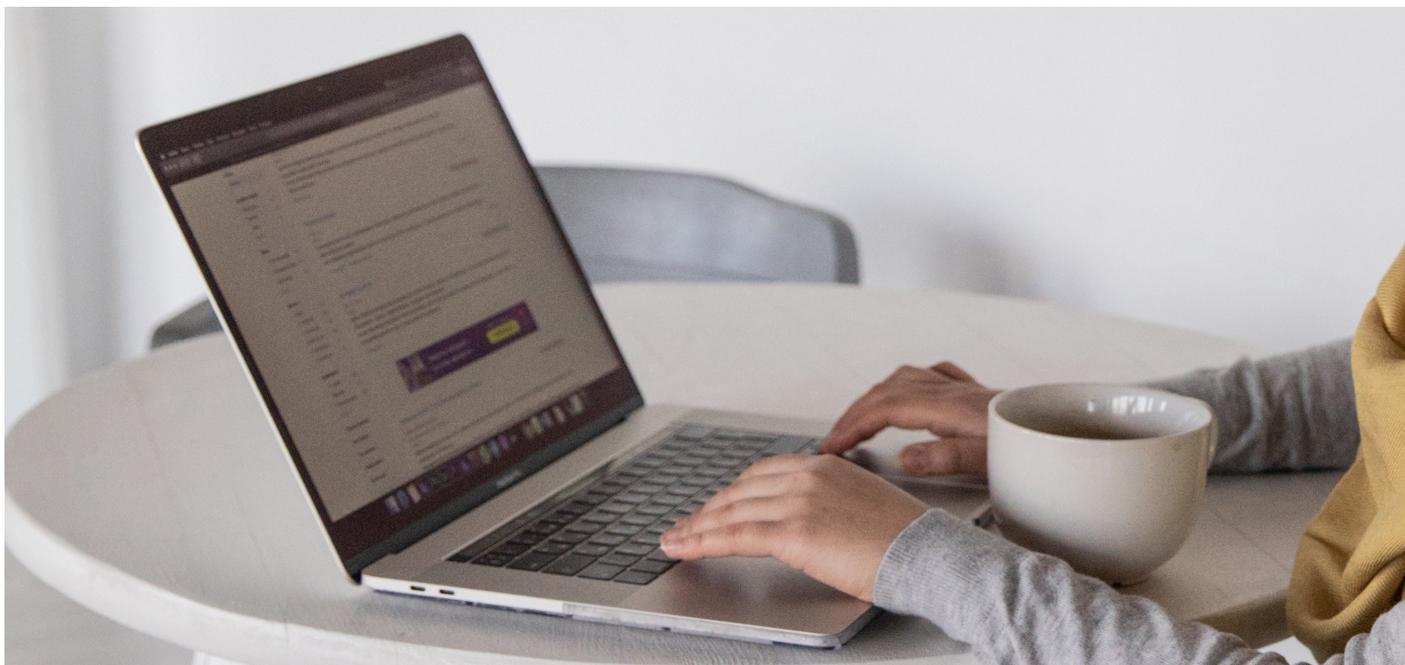
JUMPSTART

JumpStart is an AI job-matching platform designed and deployed by GovTech, in partnership with Workforce Singapore (WSG), to improve the popular MyCareersFuture jobs portal.

JumpStart was designed in 2021 as a stand-alone, cloud-based centralised job search and matching platform that could easily link to MyCareersFuture through microservices. This architectural approach also made it easy to re-use Jumpstart for other similar government applications to include relevant functionality from commercial AI vendors and integrate that functionality with JumpStart capabilities, as and when needed.

The JumpStart engine provided the jobs portal with improved AI capabilities for more fine-grained filtering and matching, for better search results. This resulted in improved job-matching recommendations for both job seekers and employers using the MyCareersFuture portal.

As JumpStart's machine learning algorithms are trained on local data from the MyCareersFuture portal, its job search-related terminology, classifications and recommendations reflect local conditions and preferences.

JumpStart lets users:

• Filter for listed job openings that are eligible for WSG government support programs.

• Link to SkillsFuture Singapore (SSG) listings of relevant courses relevant for a desired job.

• Use government information on local labour marketing conditions and trends as part of the recommendations.

The MyCareersFuture portal clickthrough rate more than doubled from 5% to 12% after deploying the JumpStart recommendation engine for search and matching. Since JumpStart's launch, more than 5,000 job seekers have successfully secured jobs through Jumpstart-enabled "Recommended Jobs" feature of the portal.

International Collaboration and Partnerships

GovTech welcomes opportunities for knowledge exchange and sharing lessons with like-minded governments and agencies that are also driving Digital Government transformation.

One major forum for knowledge sharing is the **Digital Government Exchange (DGX)**, organised since 2016. Held in Singapore, this is a by-invitation-only annual global gathering of Government Chief Information Officers (CIOs) and public sector leaders from digital governments and smart cities.

Attendees include representatives from Australia, Canada, China, Denmark, Estonia, Finland, France, Israel, Japan, New Zealand, Republic of Korea, Sweden, the Netherlands, the United Kingdom (UK) and the United States of America (USA). Representatives from multilateral institutions such as the United Nations, the World Economic Forum and the World Bank also attend these discussions.

As a one-of-its-kind international platform, DGX has developed a community of like-minded leaders who can engage in information exchange, sharing of experiences, and mutual learning, while exploring future collaboration opportunities.

For more information about other GovTech outreach initiatives, including international engagements and partnership opportunities on Digital Government, visit this **page**.

For More Information

• To explore the exciting possibilities of what Digital Government innovation can achieve, reach out to us at **tmo@tech.gov.sg**.

• Discover Singapore's Digital Government Journey **here**.

• Enjoy **a series of videos on Singapore's Digital Government Journey**, produced in collaboration with the United Nations Department of Economic and Social Affairs (DESA).

• You can explore a world of GovTech solutions on the **Singapore Government Developer Portal**.