Fact Sheet

ARTIFICIAL INTELLIGENCE
INDUSTRY INITIATIVES

The Infocomm Media Industry Transformation Map (ICM ITM) is Singapore's roadmap to push forward with digital transformation, and enable development and new growth in the digital economy to enable a Smart Nation vision.

The ICM ITM seeks to prepare the Singaporean workforce for the future digital economy through three thrusts

- Leveraging Frontier Technologies and Exploring New Growth Areas;

- Encouraging companies to Adopt technology to improve Productivity and Efficiency;

- Strengthening the core of the ICM sector

Artificial Intelligence (AI) has been identified as one of four frontier technologies which is essential to growing Singapore's economy, alongside Cybersecurity, Immersive Media and the Internet of Things. AI Singapore was set up in May 2017 with an up to S$150 million fund to catalyse, synergise and boost Singapore's AI capabilities. IMDA believes that it is important to assist industries in reaping the benefits of AI by driving understanding and adoption of its fundamentals and possibilities across sectors.

Moving forward, IMDA, in collaboration with AI Singapore, will do more to develop the AI ecosystem, strengthening Singapore's ICM core and speeding growth in the Republic. We will **drive industry adoption and understanding** of the benefits from implementing AI; **build a vibrant core of AI developers and companies**; **address specific AI leadership areas** to grow industry capabilities; and **continue to provide clarity and review relevant regulations** which would enable AI solutions.

Drive industry adoption and understanding

IMDA hopes to make AI adopted as pervasively and ubiquitously as smartphones. To do so, we will drive industry adoption by improving businesses' understanding of the value that AI solutions can have on their enterprise, introducing suitable solutions for their needs; and supporting collaborations to showcase demonstrative projects in key sectors.

User companies who are looking to adopt AI solutions can expect to receive support in two ways. First, to catalyse adoption, IMDA is launching an AI Business Partnership Programme. The programme will seek to help companies solve business challenges through matching AI solutions, and supporting their adoption or prototyping. As part of the programme, IMDA will also conduct workshops for businesses, to share potential applications of AI that can bring value to their business, and to introduce or co-develop suitable solutions for their needs. AI solutions which can serve the needs of broad swathes of companies – for example, in accounting or human resources – are of particular interest.

Second, IMDA will leverage SMEs Go Digital to reach out to a wide number of companies to broaden their exposure to AI. SMEs Go Digital will further augment its Digital Tech Hub to advise enterprises on AI, as well as how SMEs can apply ready solutions to their businesses.

Build a vibrant core of AI developers and companies
It is also necessary to produce a pipeline of locally-based, globally-known, trained AI-enabled professionals to support the growth in demand. To ensure enterprises have the talent to implement AI, IMDA will work to narrow the gap in the talent pipeline and deepen skills in the existing ICM workforce. The pool will come from a mix of roles such as AI Scientists, AI Researchers, AI Engineers, AI Business Analysts and more.

These could be achieved through various efforts such as: Academic courses; research & development; and TechSkills Accelerator (TeSA) initiatives (which include short courses for skills upgrading, immersion programmes and company-led training programmes). As a start IMDA will help to train part of this pool through an AI Singapore Apprenticeship Programme supported through TeSA company-led training programmes.

Address specific AI leadership areas and build tech creators

IMDA will also help spearhead specific areas in AI where we can help to grow and create new capabilities, such as with AI libraries. Such capabilities would enable Singapore to be a key node in the global AI ecosystem.

For example, speech solutions are a growing digital interface touchpoint which could augment, or replace, traditional text inputs such as keyboards and number pads. Areas where this would be useful include speech-enabled mobile banking, robotic kiosks, medical transcriptions etc. The global speech and voice recognition market is growing, and expected to reach USD$18.3B by 2023, according to a Markets and Markets survey.

Therefore, IMDA will strengthen support for AI companies and grow the AI ecosystem in two ways.

Firstly, to enable AI creators, IMDA will build capabilities in specific leadership areas such as a suite of AI libraries to enable innovation of AI-related applications. For example, a National Speech Corpus (one such kind of AI libraries) is necessary to support and enhance the accuracy of speech recognition engines in the Republic, in addition to enabling global AI creators to provide speech related solutions for use here.

The second means is to help build confidence in our local AI companies via the newly enhanced Accreditation@SG Digital programme. To date, we have accredited eight (8) AI companies, five (5) of which are newly minted today, tackling challenges such as online fraud prevention and regulatory compliance. These accredited companies help showcase the strength of local AI enterprises and are leading examples of quality AI companies and solutions to adopt.

Continue to provide clarity and review relevant regulations
Finally, Singapore will continue to build upon our solid regulatory base in data policy with forward-thinking and relevant AI & data governance guidelines for regulatory certainty. This would reinforce the Republic's status as a leading destination for companies seeking to site, adopt, utilise and establish AI; as well as establish thought leadership in AI governance and policy.

Given the nascent state of AI development, to further encourage market adoption and development of AI, the Personal Data Protection Commission (PDPC) will continue to maintain a 'light-touch' regulatory approach through existing baseline data protection laws. However, the PDPC is cognizant that the methods by which data is generated and used today is vastly different from a decade ago, and Singapore must continue to stay ahead through responsible use of data (such as for the purposes of AI) and understanding the legal, policy and governance issues arising from AI & data.

To that end, the PDPC has released a Guide to Data Sharing in July 2017. The Guide outlines approaches for data sharing in compliance with the PDPA. It also articulates a data sharing arrangement framework within a regulatory sandbox which exempts enterprises from certain obligations to trial and support innovative uses of personal data. We are also exploring further research collaborations with Institutes of Higher Learning (IHLs) to advance scholarship and discourse in legal, policy and governance issues arising from the use of AI and data. Such explorations and clarifications would aid in contextualising the developments in AI and data use, and the impact and implications of such developments in decision-making.

Initiatives to build up AI capabilities in Singapore

Companies already in the AI space or looking to adopt AI solutions can thus look forward to better support from the following initiatives intended to grow the AI ecosystem through:

1) An AI Business Partnership Programme to facilitate partnerships between local companies with AI solutions providers

2) Widened availability of AI solutions via Accreditation@SGD and SMEs Go Digital

3) A pipeline of locally-grown, globally-known AI-enabled talent via the AI Singapore Apprenticeship Programme

4) Creation of AI libraries starting with a National Speech Corpus

AI Business Partnership Programme

IMDA is launching an AI Business Partnership Programme (AIBPP) - a guided process to pair local companies with potential problem statements with AI solutions providers - and support such partnerships to develop and deploy prototypes/solutions suitable for their business needs. Through the programme, IMDA aims to increase awareness about the potential value of AI and the opportunities it holds for businesses, and catalyse adoption of AI solutions by local companies. These local companies could eventually serve as beacons for their respective industries as early adopters of AI to power their businesses.

Where relevant, IMDA will work with ministries and agencies to address problem statements which could be solved through the innovative use of AI. For example, in the finance industry, machine learning processes can be utilised to improve monitoring and anti-fraud systems as well as to integrate various datasets to generate predictive models for the insurance sector.

IMDA encourages user companies to work with AI solution providers on proofs-of-concept to integrate AI solutions into their company/product. Under the AIBPP, IMDA will consider defraying adoption risks by co-funding up to 50% of supported qualifying costs for suitable projects, to a maximum of S$100K/project. IMDA is also open to supporting large-scale industry-leading projects with the potential to disrupt sectors through the integration of AI on a case-by-case basis.

To facilitate this process, IMDA will help to match companies with problem statements with appropriate solutions providers. Guided by problem statements supplied by companies, IMDA will facilitate pitching sessions between interested AI solutions providers and companies. As part of this process, AI solutions providers might also work with the companies to further scope problem statements, provide mentorship, customize and finally deploy AI solutions to achieve business outcomes. Companies with problem statements which have no currently-available commercial solution will be channelled to AI Singapore's 100 Experiments track.

Parties keen on exploring collaborations through AIBPP are encouraged to sign up at www.imda.gov.sg/AIBPP by December 15.

AI Workshops

IMDA will raise industry awareness on the potential of AI solutions by conducting workshops for AI solutions providers to share their technologies with specific sectors in the AIBPP. These workshops will be tailored to offer sector-specific case studies and possible AI solutions. IMDA has already conducted the first such workshop in September for the retail and advertising sector, which saw a promising crowd of 12 retail and advertising companies attending. IMDA plans to conduct one workshop every quarter.

The next workshop is currently planned for December and will be for the professional services sector. Interested companies and AI solutions providers for the workshop are encouraged to sign up at www.imda.gov.sg/AIBPP by November 30.

Widen availability of AI solutions via Accreditation@SGD and SMEs Go Digital

To make AI solutions readily available for enterprises to adopt quickly, Accreditation@SG Digital (A@SGD) will focus on AI as part of the identified four key frontier technologies. For a start, we have accredited five new AI companies, taking the total number of accredited AI companies to eight. For more information on the enhancements to A@SGD, please refer to the A@SGD fact sheet.

IMDA has set up the SME Digital Tech Hub (DTH), to advise and assist SMEs to fully take advantage of business opportunities that AI can help them achieve. The DTH will work closely with SME Centres, Trade Associations and Chambers to conduct workshops to raise SMEs' awareness and adoption of AI. Two Memoranda of Intent between IMDA and IBM and Microsoft, will give the DTH access to AI technologies from both companies to support SMEs on their digitalisation journey. For more information, please refer to the SMEs Go Digital fact sheet

AI Singapore Apprenticeship Programme

The AI Singapore Apprenticeship Programme (AIAP) is the first TechSkills Accelerator Company-Led Training (TeSA-CLT) initiative in AI. This is a collaboration between IMDA and AI Singapore to develop a pipeline of AI professionals for the industry.

We aim to train up to 200 AI professionals in this field in batches over the next three years through the AIAP. It is a collaboration between IMDA and AI Singapore, and will be accelerated to train more AI apprentices should demand by industry be strong.

Through this CLT, fresh professionals will obtain skills training and mentorship; whilst industry will provide industry projects and attachment opportunities for the trainees to gain on-the-job training experience.

The AIAP is a full-time, nine-month structured CLT, where trainees will be attached to industry projects for on-the-job training alongside AI courses conducted by AI Singapore and affiliated education organizations.

At the end of the training, AI Professionals will be equipped with skills in machine and deep learning programming & development; the ability to deploy AI as a data product and/or service; and have hands-on experience in industry AI projects, mentored by experienced AI professionals.

To be eligible for the AIAP, a trainee must be:
- A Singapore citizen holding a Degree qualification in: ICT; Science, Technology, Engineering and Math (STEM) disciplines; or related disciplines.

- Be a fresh professional (Within three years of graduation)

Interested parties may register their interest at the following email: AIAP@AISingapore.org

National Speech Corpus

A corpus is a library of audio and text files, and is one of the key building blocks which AI technologies such as Automatic Speech Recognition (ASR) need to function. ASR solutions (E.g. voice assistants) train themselves with corpora to decipher spoken words and transcribe it into text.

One example of how the National Speech Corpus (NSC) works to benefit ASR technologies:
- A Singaporean speaks into their phone rather than typing. The audio is captured by an ASR solution, which is used by a chatbot application. *("Where can I find store X?")*

- The ASR solution, which was trained and modelled from the NSC to adapt to accents in Singapore, transcribes the audio into text.

- The text is now machine-readable, or understandable by computers. The chatbot application can then formulate a response. *(Keywords: Where, Find, Store, X)*

- The response is given to the user. *("Store X is found on level 4, section H")*

Multiple corpora with extensive data therefore increase the precision of transcriptions, resulting in more accurate responses. However, obtaining such corpora has been traditionally difficult for industries to obtain, as access to different sectors' data to expand a corpus can be challenging.

This is thus one of the specific identified areas which IMDA can help grow and create further capabilities for AI companies keen to develop speech-enabled applications. IMDA will build a locally-accented and contextualised NSC in English.

Technology providers, institutes of higher learning and research institutes will be able to leverage on the NSC to create innovative speech-enabled applications for various industry sectors.

What is AI?

Artificial Intelligence refers to a set of technologies that seek to simulate human traits or processes such as: knowledge, reasoning, problem solving, perception, learning and planning. These technologies use algorithms and data to train computer systems to be adept in performing specific tasks, or become more human-like in thinking and decision-making.

Some of these technologies include: Automatic Speech Recognition, Natural Language Processing, Computer Vision, Robotics, etc. with three general machine learning techniques: Supervised, unsupervised and reinforcement learning.

AI technology is already integrated in many aspects of our daily lives – for example, through voice-recognition applications on smartphones, or e-commerce suggestions on products. Studies indicate that AI will be one of the next major drivers of productivity growth globally.

As one of the world's most connected countries, Singapore is the perfect spot to ride the global AI wave in a digital economy through the widespread use, adoption and infusion of AI-empowered applications and devices. IMDA recognizes that the application and deployment of AI – such as near-real time analysis of collected data (video, audio and/or text data) – has the potential to transform industries and boost productivity. Businesses can offer new features to their customers by introducing AI-powered functionalities to their applications. One example could be in the combination of AI, data analytics, and Internet of Things sensors to better optimize manufacturing flows and equipment.

About Infocomm Media Development Authority (IMDA)

The Infocomm Media Development Authority (IMDA) leads Singapore's digital transformation with infocomm media. To do this, IMDA will develop a dynamic digital economy and a cohesive digital society, driven by an exceptional infocomm media (ICM) ecosystem – by developing talent, strengthening business capabilities, and enhancing Singapore's ICM infrastructure. IMDA also regulates the telecommunications and media sectors to safeguard consumer interests while fostering a pro-business environment, and enhances Singapore's data protection regime through the Personal Data Protection Commission.

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