



AI INNOVATION PROSPECTUS 2021

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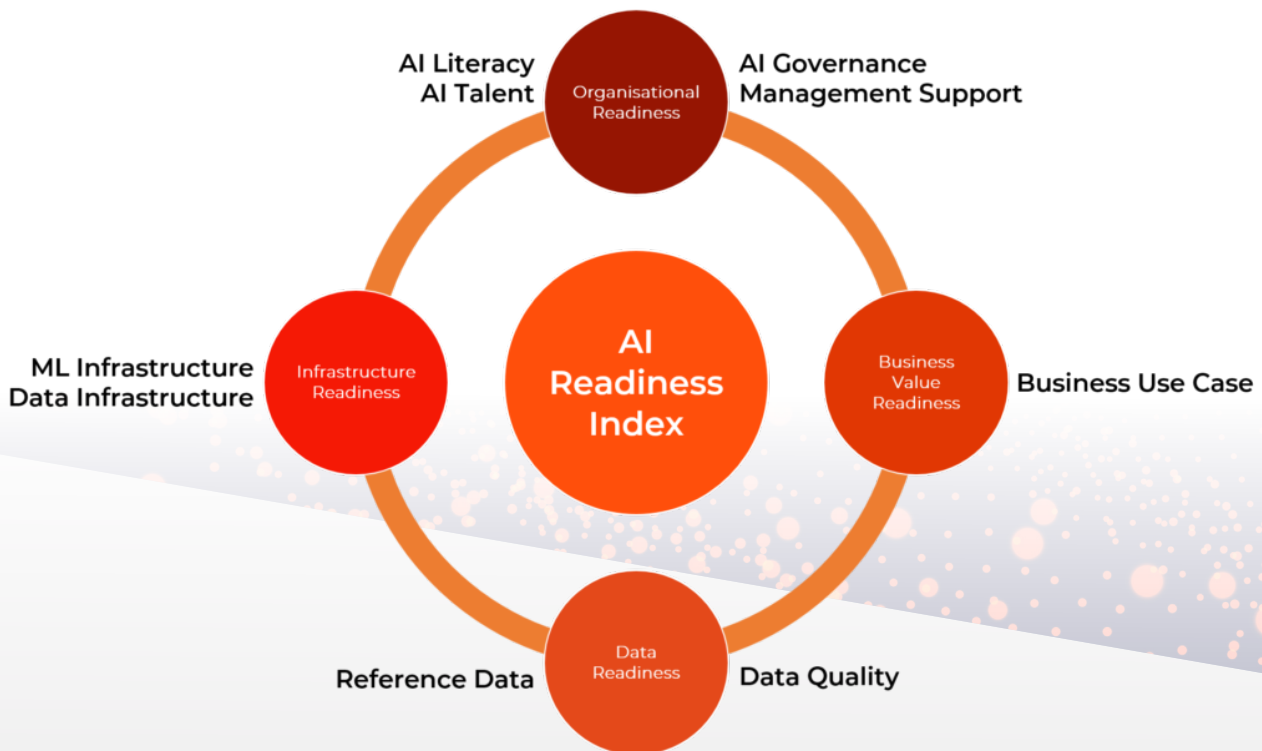
EMPOWERING ORGANISATIONS TO CREATE VALUE WITH AI

AI has the potential to transform industries by enabling organisations to achieve unprecedented improvements in operational efficiency and to create new services and business models. It has applications in almost every sector of the economy – from early diagnosis of chronic disease in healthcare, to optimal chip design in the semiconductor industry, to improved coordination and resource optimisation in logistics, and many, many more.

But not all organisations will find themselves at the same starting point for AI; nor will they be targeting the same goals.

Before embarking on an AI adoption journey, therefore, it is important for organisations to know where they are in terms of AI readiness, and where they want to go. They have to understand how the technology can fit in with their business goals, and what are the pathways that they can take to create value and achieve their business objectives through AI.

AI Singapore (AISG) supports organisations in this AI adoption journey with the following resources:



AI Readiness Index (AIRI), an industry-focused framework for organisations to assess their AI adoption readiness



Source: AIAP apprentices with 100E Project Sponsor, KroniKare (NHK World May'19)



Synergos



Through the 100E programme, AISG matches and assembles a team of AI researchers, AI engineers, and AI apprentices to help an organisation solve their AI problem statement.

Our engineering platforms provide AI tools and solutions to help organisations with no full AI engineering capabilities solve their business challenges in a fast and cost-effective way.

AI READINESS INDEX

The AI Readiness Index (AIRI) is a framework and self-diagnostic tool that helps organisations to assess their AI readiness and identify appropriate approaches or AISG programmes they can adopt in order to create greater value through AI and progress in their AI maturity journey.

The framework is based on cumulative insights distilled from speaking with over 500 companies on their AI problem statements, and working with them on over 70 AI projects. Through these engagements, AI Singapore has accumulated a wealth of experience in managing real-world industry problems and issues that enterprises face when they start their AI journey.

AIRI assessment criteria

The AIRI assessment tool enables organisations to evaluate themselves against the four key criteria for AI readiness:

	Criteria	Description
1	Organisational Readiness	This includes different factors such as the AI literacy levels of employees, availability of AI talents within the organisation, awareness of AI governance concepts and overall management support for AI
2	Business Value Readiness	The ability to identify use cases for AI and their value proposition to the organisation
3	Data Readiness	This ascertains whether the organisation has the processes, policies and people in place to oversee and manage data quality, and to ensure that there is data consistency and a single source of truth
4	Infrastructure Readiness	The IT infrastructure resources for proper storage for data and for AI model training and deployment



AIRI assessment outcomes

The AIRI tool will generate a report with the result of the assessment, an interpretation of the findings, and the recommended actions and programmes to help the organisation progress in its AI maturity journey*.

Assessment outcomes	AI Unaware	AI Aware	AI Ready	AI Competent
Interpretations	Organisation might have heard about AI but is unaware of its potential applications	Organisation is aware of AI and is able to identify potential use cases	Organisation has the capabilities to integrate pre-trained AI models into products or business processes	Organisation has the capabilities to develop customised AI solutions for specific business needs
Focus	Increase AI literacy of the organisation	Get organisation to adopt AI solution	Help organisation to accelerate AI adoption	Deepen the organisation's AI capabilities
Suitable AISG programmes	AI4E®	AI4E®, AI4I®, AI4L	AI4E®, AI4I® (Advanced), AI4L, AI Discovery, AI Clinic, AI Advisory projects, 100E, AIAP®, AIDP, AIAP-X	AI4E®, AI Certification, AI4L, 100E, AIAP®, AIDP, AIAP-X

* Do note that not all organisations have to progress from AI Unaware to AI Competent in order to reap the benefits of AI. Adoption of the technology will depend on business needs and objectives.

INDUSTRY DEVELOPMENT

Another strategic thrust of AISG is to develop and anchor deep national capabilities in AI and build a vibrant AI ecosystem that will create positive social and economic impacts and put Singapore on the AI world map.

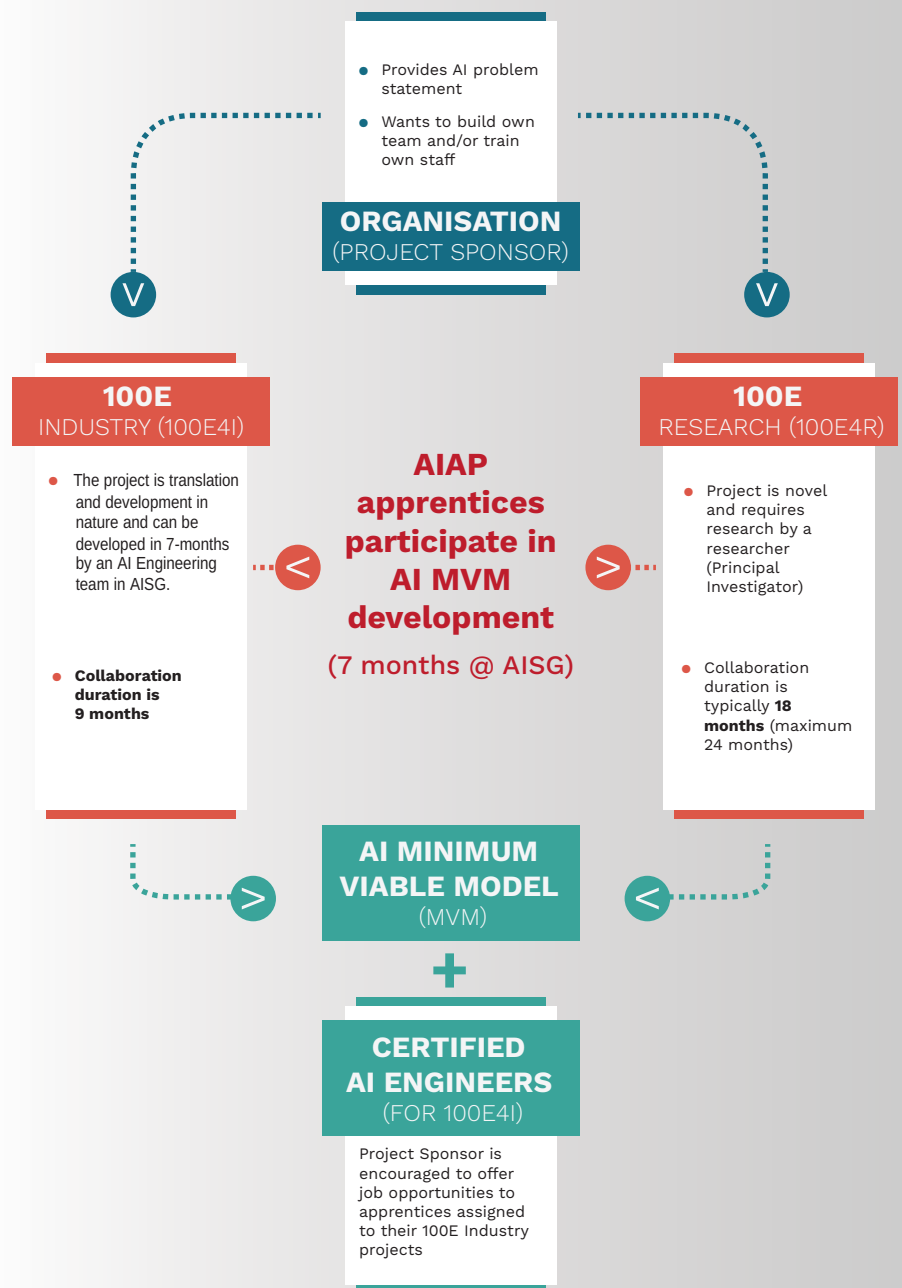
100 Experiments

100 Experiments (100E) is an AISG flagship programme that seeks to help organisations to solve problems using AI and to build their own AI teams.

An organisation may propose 100E problem statements which cannot be addressed by any commercial off-the-shelf (COTS) AI solution, but can potentially be solved by Singapore's ecosystem of researchers and AISG's engineering team within 9 to 18 months.

An AI Engineering and MLOps team from AISG may fully undertake the 100E project to develop and deploy an AI minimum viable model within 9 months. The AISG team is staffed by full-time AI, data and platform engineers as well as apprentices from the AI Apprenticeship Programme (AIAP)®.

Alternatively the AISG engineers may join a principal investigator and his/her research team from Singapore's autonomous universities, A*STAR research institutes or any other Singapore-based publicly-funded research institutions to work on the organisation's problem statement. 100E projects under this arrangement usually last 18 months. AISG will provide funding of up to S\$250,000 per 100E project to the principal investigators and their teams, and the organisation is required to match the funding in-kind (AI/engineering/IT/domain manpower) and in cash.



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The 100E collaboration has helped IBM to solve our business problem as well as up-skill our employees in AI. I am particularly impressed by the significant improvement in the performance of the AI model and the final minimal viable product that was delivered.

Julian Tan, Senior Manager, Analytics Solutions, IBM

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The AI model developed in collaboration with AISG under the 100E programme has since been integrated into the systems at RenalTeam's dialysis centres. It serves as a decision support tool for medical staff. Patients who are flagged out by the AI model are prioritised and re-assessed by senior nurses who will then decide if any medical intervention is needed. We look forward to using and enhancing the AI model to help our care teams make better data-driven decisions to improve our care and reduce the hospitalisation of our patients.

Chan Wai Chuen, Managing Director, RenalTeam Group


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The AI solution developed under the 100E collaboration with AISG has taken away much of the grind involved in claims reviews while delivering a 90 percent improvement in fraud detection. At least 20 percent of customers also had their claims processed and payment disbursed much more quickly and in the near future, it will be possible for this to be done within minutes. The improved workflow also enables the company to focus more on talent development. Instead of getting employees to manually review claims, they can now use their time more effectively to hone their skills in analysing and investigating suspicious cases.

Dr Patrick Chin, Head of Digital & AI Practice, Global, Head of Branding & CX, Sompo

13%



Accountancy / Banking /
Finance / Business /
Data Analytics

14%




Arts / Social Sciences /
Business / Others

22%



Computer Science /
Computer Engineering / ICT

25%



Science (Chemistry,
Physics, Maths etc)

26%



Engineering (ME, EE, EEE etc)



176

Total number of
apprentices trained
in batches #1- #8

Post AIAP employment:

AI engineers or data scientists
in organisations including the
Singapore Tourism Board, Grab,
Singtel, Wartsila and
AI Singapore.

AI Apprenticeship Programme (AIAP)[®]

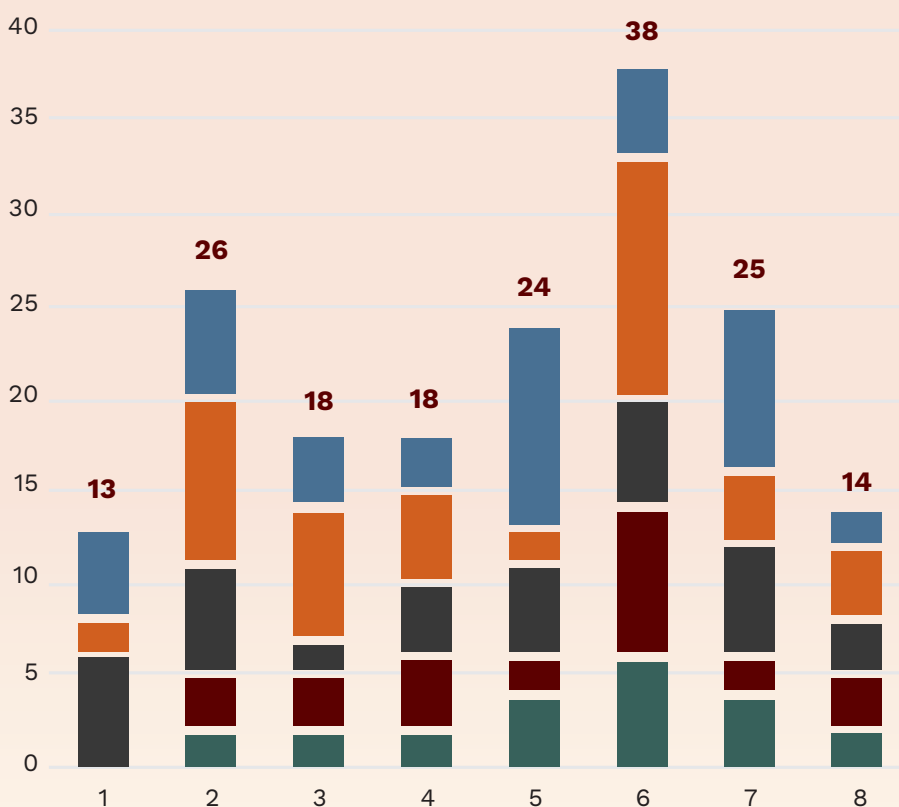
The AI Apprenticeship Programme (AIAP)[®] is an initiative by AISG to groom local AI talent by enhancing their technical skills and helping them to build their careers in AI. It gives apprentices the opportunity to work on real-world industry projects, from the scoping of business problems to building and deploying AI solutions.

AIAP is a full-time structured training programme comprising

- 2 months of self-directed learning with a combination of online and face-to-face mentoring
- 7 months of on-the job training where apprentices deep-skill by working on real-world AI projects

Applications for AIAP are open to Singapore citizens only. The programme is fully sponsored, with apprentices eligible for a monthly stipend of S\$3,500-S\$5,500 (depending on the number of years of working experience).

Profile of the first eight batches of AIAP apprentices



Information is accurate as at 30 May 2021



AIAP Batch 2

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One of the many useful skills I picked up during AIAP was the ability to communicate with business users and discover the real problem statement before searching for an appropriate solution. AI/ML is no magic pill so identifying the right problem to solve is something I am grateful to have learnt through my involvement in the 100E project during AIAP. There are many technical tutorials out there but few programmes offer such hands-on experience in addressing real-world problems.

Derek Chia (Batch 1)

Current role
Engineer, Defence Science and Technology Agency (DSTA)

Before joining AIAP
Cyber Security Consultant,
EY Singapore

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I was a graduate of the second batch of AIAP and have benefitted greatly from the programme. The project that I was assigned to was challenging as it required a combination of software engineering, data science and machine learning skills. In addition, the experience of working in cross-functional teams was enriching as it allowed me to appreciate the importance of balancing a project's technical and business requirements. The skills and knowledge that I acquired during AIAP have been invaluable for my career in the field of data science and machine learning.

Dr Daniel Ng (Batch 2)

Current role
Data Science Technical Lead, Ink Supplies Operations, HP Inc.

Before joining AIAP
Ph.D. student
(Civil and Environmental Engineering, NUS)

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I wanted to be exposed more to the engineering aspects of AI and data science projects and AIAP gave me this opportunity. In my previous interactions with industry, I observed this growing and crucial need to have a good infrastructure in place so that organisations can grow in their AI and data science capabilities. During the apprenticeship programme, I felt a great sense of achievement when I was able to integrate data versioning into the data platform and demonstrate to AI engineers and AI apprentices how we could use this feature in the various projects undertaken by AI Singapore. Through AIAP, I built up a set of transferable skills which eventually opened doors for me to join a different industry from the ones that I was previously in.

Desiree Chen (Batch 6)

Current role
Vice President, CFO Unit,
Singapore Exchange Limited

Before joining AIAP
Pricing and Merchandising Analyst,
Singapore Airlines



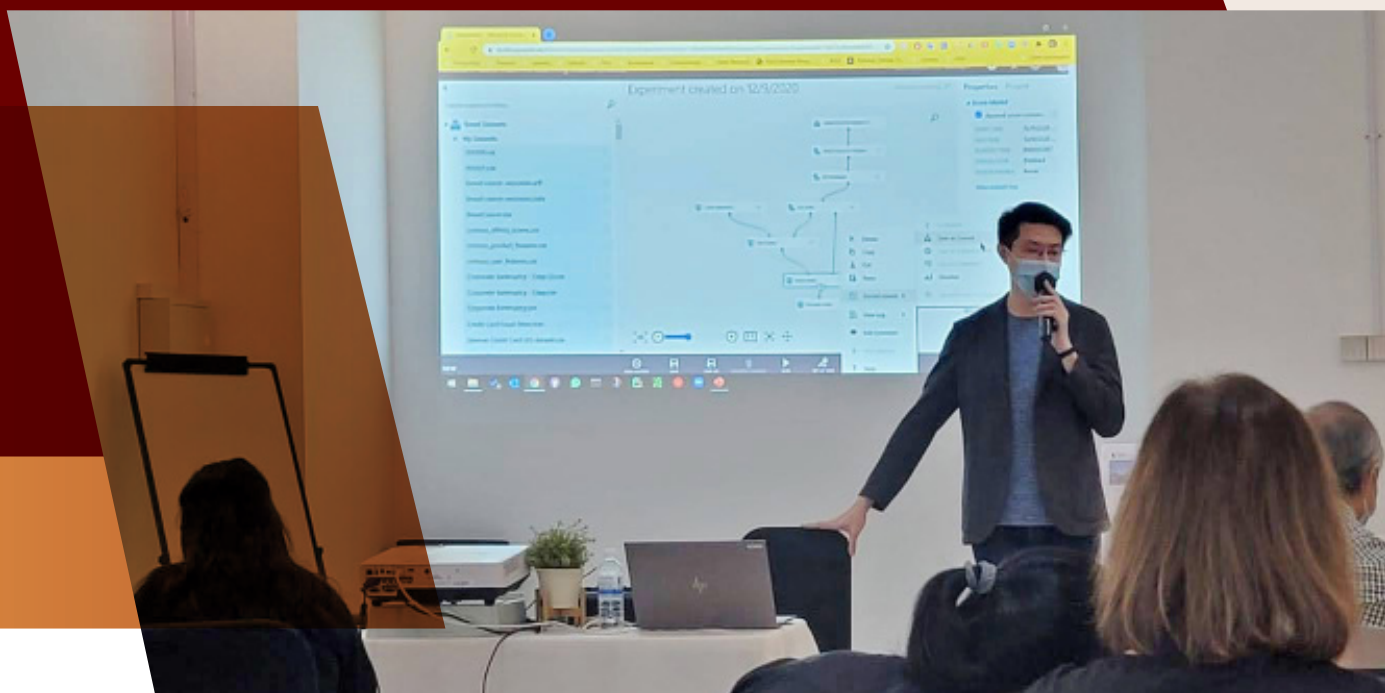
Building A Strong AI team

Find out [how AISG built up a 200-strong AI engineering team with the blue ocean strategy.](#)

Organizations that are keen to replicate the AIAP model to build up their own AI talent pipeline can contact us at <https://aisingapore.org/home/contact/>

INDUSTRY ADVISORY

One of AISG's strategic thrusts is to help organisations with their AI transformation journey in order to build an AI-savvy ecosystem that is engaged, informed and ready. In line with this, our Industry Advisory services are designed to help organisations to accelerate AI adoption and deploy the technology effectively to create value for their business.



AI Advisory (AI Clinic, AI Discovery)

AI Advisory services are aimed at helping organisations to get started on AI, and to identify and prioritise use cases for development. There are currently two AI Advisory programmes:

AI Clinic

The AI Clinic is an interactive theme-based workshop that gives organisations access to AISG's wealth of experience in identifying feasible AI use cases to adopt, and provides business leaders with advice on suitable approaches to their AI journeys.

The Clinic is 2.5 hours long and may be conducted physically (recommended) or via videoconferencing. Participants may come from different companies but

will be from the same industry or business function, based on the theme of the workshop.

Through the workshop, participants will learn about AI solutions that are relevant to their industry or function, and get practical recommendations on how their organisation can get started on AI. They will also have the opportunity to engage in roundtable discussions facilitated by AISG's AI consultants to address any concerns or challenges they may have with AI adoption.

By the end of the workshop, participants will understand practical AI use cases specific to their industry or function, potential AI solutions that they can explore and possible ways to implement these AI solutions within their organisation.

AI Discovery

The AI Discovery programme helps organisations to improve the success rate and value obtained from their AI initiatives by using a proven, structured approach to ideating and prioritising use cases for AI development. It is inspired by Design Sprint, a process that applies design thinking to reduce risk in product development, and is adapted based on AISG's experience in providing advisory services to businesses to identify, scope and develop AI solutions.

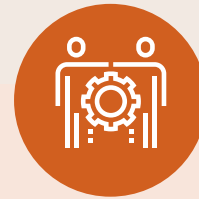
AI Discovery consists of two separate 2.5-hour workshops: Ideation and Prioritisation. The sessions are held on separate days and are conducted either physically (recommended) or via videoconferencing.



Ideation Workshop

Through the Ideation Workshop, organisations will uncover potential use cases for AI development. The AISG Advisory team will help to translate business challenges into opportunities, ideate potential solutions, and build alignment among stakeholders.

By the end of the workshop, participants will be able to identify areas of opportunity for their organisations to explore, goals to pursue, blockers to investigate and potential applications to develop. These set the stage for the Prioritisation Workshop.



Prioritisation Workshop

The Prioritisation Workshop helps organisations to select the most feasible use cases for AI development.

The AISG Advisory team will help the organisations to review anonymised datasets that are relevant to potential solutions uncovered during the Ideation process. AISG will also share insights into possible AI development approaches and challenges.

The outcome of the Prioritisation Workshop will be a feasibility assessment of each use case based on data quality and data availability, and its potential business value. The assessment can be used by the organisation to select use cases for AI development.

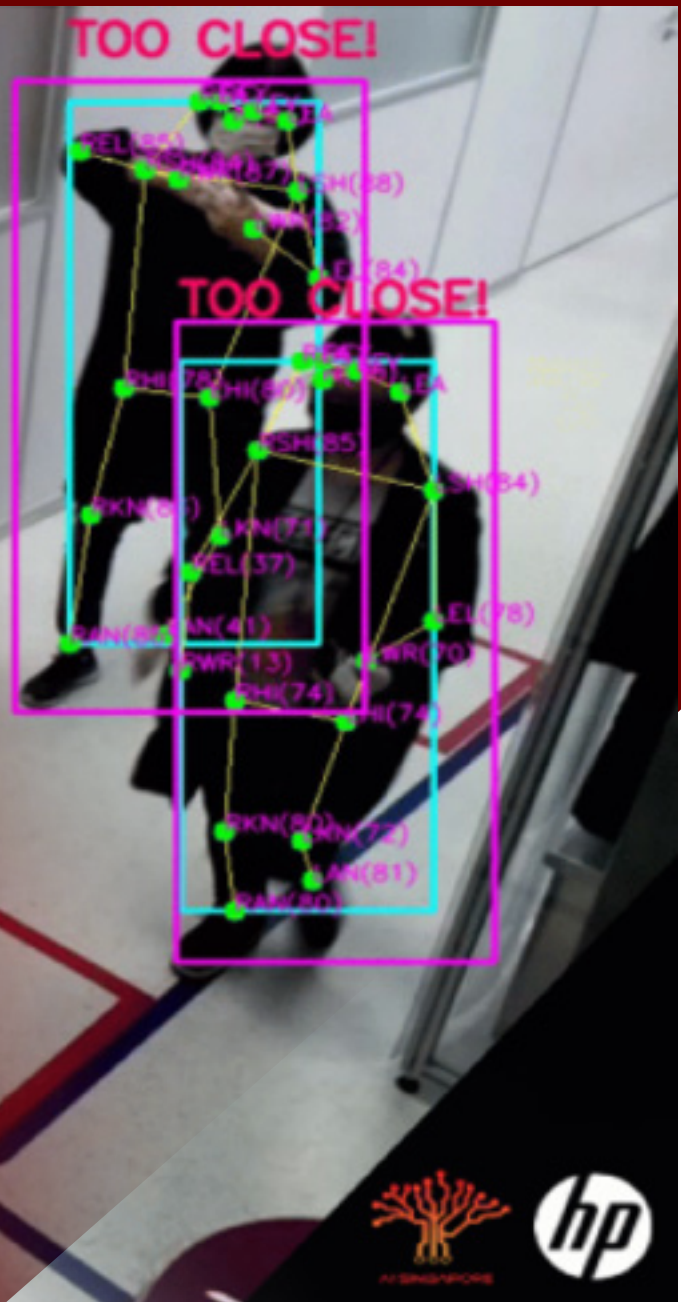
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The AI Discovery programme helped uParcel to achieve alignment across our different functions and turn data into insights in record time.

William Ng, Chief Operations Officer, uParcel

ENGINEERING PLATFORMS

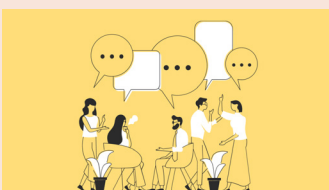
Over the past four years, AI Singapore has engaged over 500 companies and enabled companies to build production-ready AI solutions. We have already delivered several successful AI-based solutions to organisations of different types : government agencies, SMEs and multi-national corporations. Our engineering platforms provide AI tools and solutions (AI Bricks) and AI platforms that enable organisations, particularly SMEs, or organisations that do not have full AI Engineering teams to use AI on their business challenges in a fast and cost-effective way. Using AI Ready Bricks and intelligent automation as a foundation, organisations can begin to harness the power of smart automation to save costs and increase sales.



HP adopts AISG's FinePose for social distancing in its manufacturing facility

Examples include:

Speech Lab



Speech Lab is a speech engine that is able to recognise and transcribe English, Mandarin and Singlish. Our unique codeswitching technology caters to Singlish as it can recognise conversations comprising words from different languages (a mix of English and Mandarin). The speech engine can be customised for different use cases in various domains.

Speech Lab: <https://aisingapore.org/speech-lab/>

Computer Vision Hub



Leveraging its experience from the 100 Experiments programme, AISG's Computer Vision (CV) Hub has curated common, shareable components of CV solutions to develop PeekingDuck, a customisable and user-centric AI inference engine that can speed up development work for future projects. PeekingDuck is modular and provides many options for users, such as choosing to read from live camera feeds or saved videos, or choosing between different pre-trained AI models. PeekingDuck also includes ready-to-use "use cases", which tackle common problems that are solvable by CV, such as social distancing and footfall analytics. PeekingDuck is open-sourced and the CV Hub team is continually upgrading and enhancing its capabilities.

CV Hub: <https://aisingapore.org/cv-hub/>

NLP Hub



The Natural Language Processing (NLP) Hub is focused on creating language processing products and tools that are not yet available in the market, and making them accessible to companies that wish to utilise the technology to its fullest potential. Some of the areas covered by NLP Hub in its projects include the development of NLP in Southeast Asian languages; tackling the problem of text annotation; and building a system for information retrieval and question answering.

NLP Hub: <https://aisingapore.org/nlp-hub/>

Synergos



Synergos

Synergos is AISG's federated learning system. Federated Learning allows different parties to work together to train a machine learning model without exposing the data of each individual party. Synergos makes federated learning more user-friendly and accessible. It supports federated learning end-to-end from data pre-processing, model training, tuning and inferencing, to deployment.

Synergos: Coming soon

TagUI



TagUI is an open-source robotic process automation (RPA) tool that helps organisations to rapidly and easily automate repetitive, time consuming and error prone ad-hoc workflows. The goal is to create intelligent automation, which is an enhanced form of automation that combines artificial intelligence and robotic process automation. Intelligent automation allows us to create smarter programs that can make decisions based on data and automatically learn from new data. Use cases include process automation, information extraction and predictive analysis.

TagUI: <https://aisingapore.org/tagui/>

TALENT DEVELOPMENT

To develop the talent needed to power Singapore's AI efforts, AISG has introduced programmes to support various stages of skills and capability development and ensure that new AI professionals will be able to hit the road running when they enter the industry.



General AI Literacy & Proficiency

A transformative approach to AI requires AI awareness to percolate across the entire organisation regardless of function or job role. To achieve this, organisations can tap on AISG's AI for Everyone (AI4E)[®] and AI for Industry (AI4I)[®] programmes to help employees acquire basic AI knowledge and progress through various stages of skills and capability development.

AI for Everyone

AI for Everyone (AI4E)[®] is a foundational course that sets the baseline for AI literacy in Singapore.

The three-hour workshop introduces participants to modern AI technologies and applications so that they can become savvy consumers of AI products and services. They will learn how to identify opportunities and potential use cases in their work and daily lives, and to build a simple AI model with online tools.

AI4E is being offered through schools, polytechnics, the Institute of Technical Education, Civil Service College and the Smart Nation Academy.

AI for Industry

AI for Industry (AI4I)[®] is an online programme to help participants upskill and learn more about data science, ML, AI and visualisation in Python. The programme is hosted on the AI Makerspace platform and makes use of DataCamp as a resource to support the learning required to complete the programme.

AI4I is a credit-bearing module recognised by institutes of higher learning such as the National University of Singapore and the Singapore University of Social Sciences.

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It's been 11 months and I'm now certified under AI Singapore's "AI for Industry" programme!

I started this journey during Singapore's circuit breaker "lockdown" period last May. It was a fantastic opportunity to upskill via 28 DataCamp courses. Forty-three carefully-crafted lessons and nine quizzes later, I finally reached 100% completion.

Yes, I didn't expect the programme to be so comprehensive and in-depth. Best takeaways were from the "Supervised Learning", "Unsupervised Learning" and "Deep Learning" modules and I hope to further my knowledge and expertise in these areas."

Serena Goh, Technology Educator.

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Managed to complete the AI for Industry course by AI Singapore. Great course for understanding the fundamental concepts of supervised, unsupervised and deep learning!

Gaston Tan, Business Intelligence Analyst at Goldman Sachs.

ABOUT AI SINGAPORE

AI Singapore (AISG) is a national AI programme office launched by the National Research Foundation (NRF) to anchor deep national capabilities in artificial intelligence (AI) in order to create social and economic impacts through AI, grow the local talent, build an AI ecosystem, and put Singapore on the world map.

AISG brings together Singapore-based research institutions^[1] and the vibrant ecosystem of AI start-ups and companies developing AI products to perform applications-inspired research, grow the knowledge, create the tools, and develop the talent to power Singapore's AI efforts.

AISG is driven by a government-wide partnership comprising NRF, the Smart Nation and Digital Government Office (SNDGO), Economic Development Board (EDB), Infocomm Media Development Authority (IMDA), SGInnovate, and the Integrated Health Information Systems (IHIS).

For more information on AISG and its programmes, please visit www.aisingapore.org.

