

An aerial photograph of Singapore at sunset. The sky is a mix of orange, yellow, and blue. The city's skyline is visible, with many skyscrapers lit up. In the foreground, the Marina Bay Sands hotel is prominent on the left, and the Esplanade - Theatres on the Bay is in the lower left. A large body of water, Marina Bay, is in the center. A road with traffic is visible in the lower right.

AI Singapore

Anchoring Deep National Capabilities in AI

Sintia TEDDY-ANG

1 Dec 2023

Singapore's Ambition

VISION

By 2023, Singapore will be a leader in developing and deploying scalable, impactful AI solutions, in key sector of high value and relevance to our citizens and businesses



1

TRANSPORT AND LOGISTICS



2

SMART CITIES AND ESTATES



3

HEALTHCARE



4

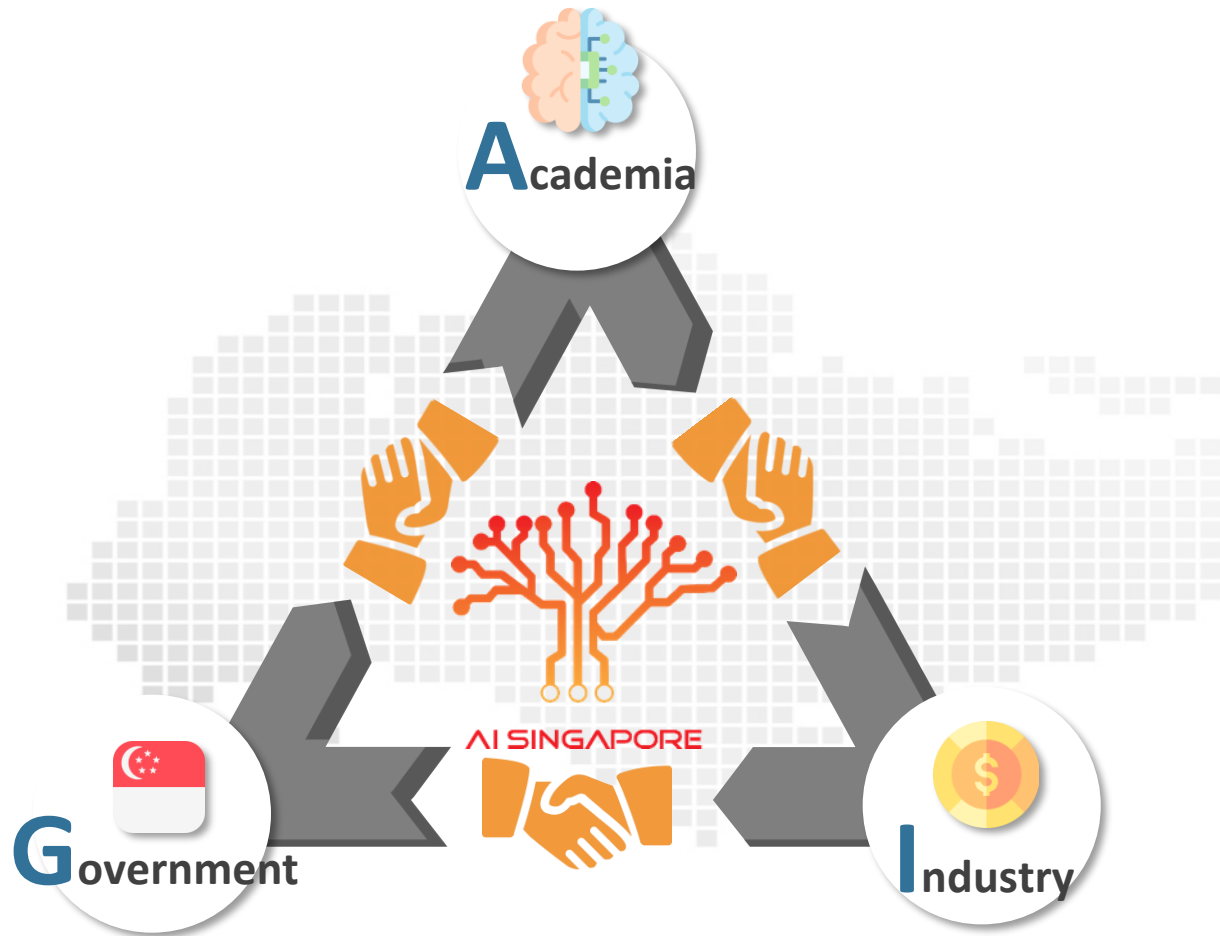
EDUCATION



5

SAFETY AND SECURITY

About AI Singapore



Launched in Jun 2017

National R&D programme in AI –
first of its kind national level setup

- build deep national capabilities in AI
- create social and economic impacts
- grow local talent
- accelerate AI ecosystem
- put Singapore on the world map

AISG Core Team <https://aisingapore.org/home/the-team/>



Prof Ho Teck Hua
Executive Chairman



Prof M Kankanhalli
Dy Exec Chairman



Prof Luke Ong
Chief Scientist



Prof Bryan Low
Dir (AI Research)



Prof Ng See Kiong
Dir (AI Technology)



Prof S Chesterman
SrDir (AI Governance)



Dr Sintia Teddy-Ang
Dir (Operations)



Mr Laurence Liew
Dir (AI Innovation)



Dr Leslie Teo
SrDir (AI Products)



Prof Ben Leong
CDO (Tech)

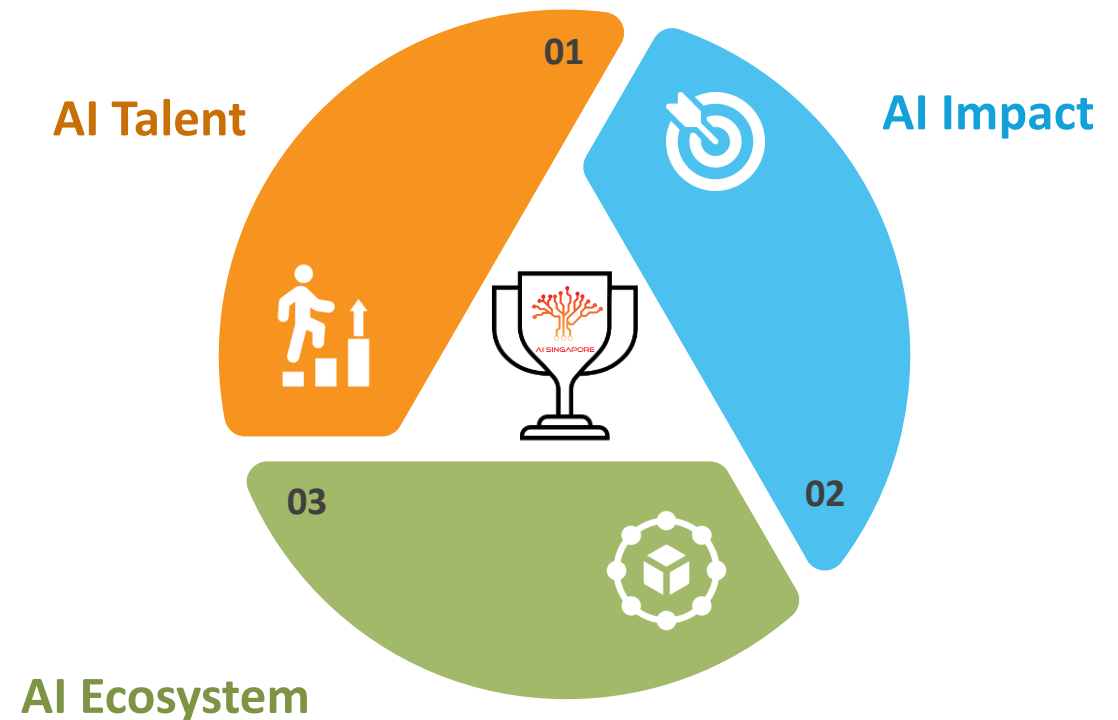


Mr Benjamin Ang
CDO (Policy)

AISG's Strategy

What major role should AI play in SG, and how can AISG facilitate it?

- 1) Grow AI talent pool
- 2) Demonstrate the value of AI through social and economic outcomes
- 3) Develop vibrant AI ecosystem for the nation





AI TALENT

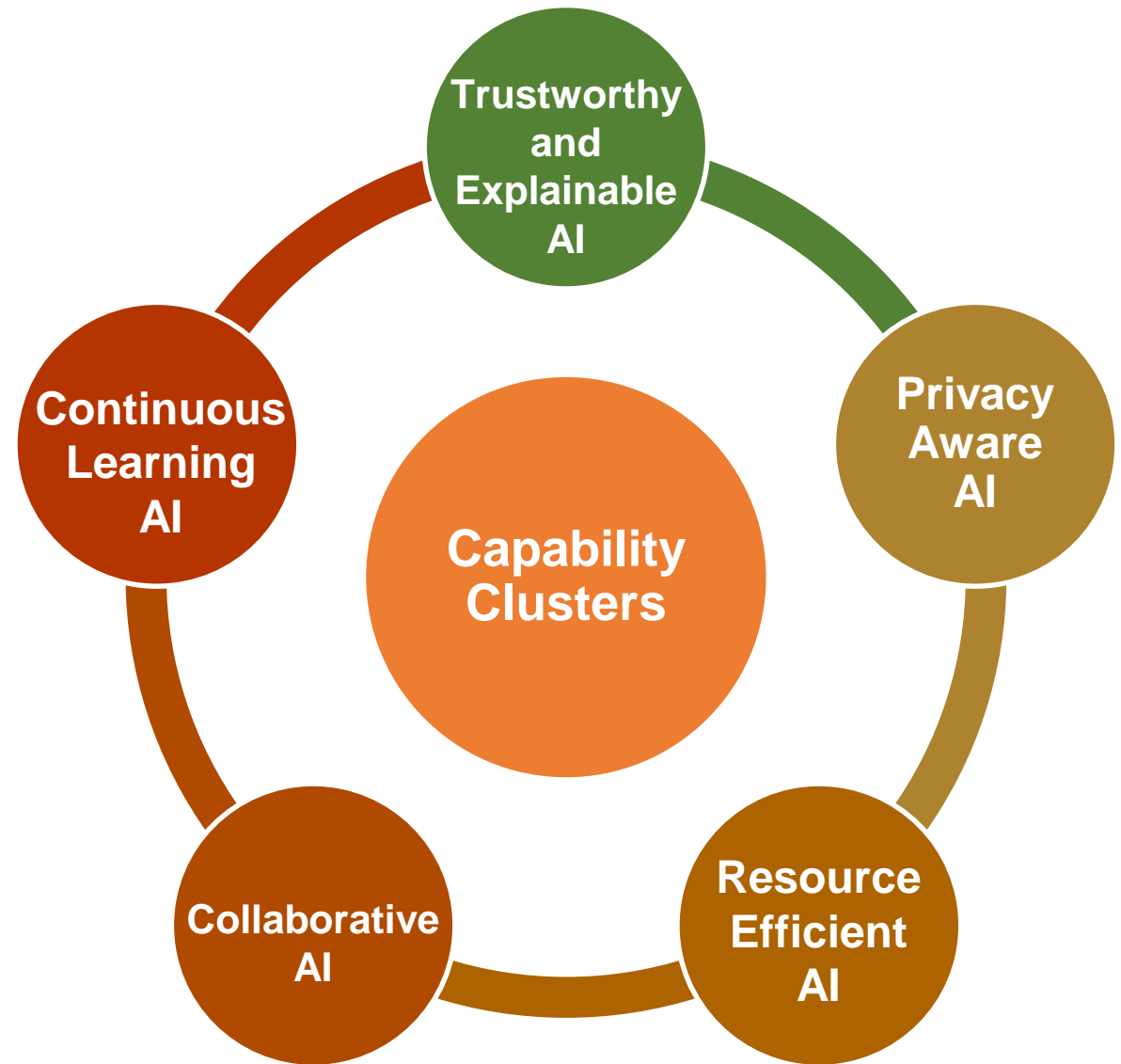
Mission:

Grow AI Talent Pool

Activities:

- AISG Research Grant Calls
- NRF AI Investigatorship
- AISG PhD Fellowships
- AI Apprenticeship Programme
- AI4x Series

Cutting Edge AI: Targeted Capability Building



Governance & Ethics: Seeding Capabilities



01

Fairness

Ensure that the benefits of AI are properly shared among the community

- *Bias detection & prevention*



02

Accountability

Ensure that AI systems are properly regulated – minimizing risk and properly allocating losses

- *Liability and compensation framework*



03

Transparency/ Explainability

Ensure that systems appropriately enable those affected to understand the process in general and a specific outcome in particular

- *Transparency tools; explainability standards & measures*



04

Ethics & Human-Centricity

Ensure that AI serves the interests of the broader community

- *Values and trust in AI*



05

Safety & Security

Ensure that AI systems are safe to use and appropriately protected against hacking and data breaches

- *Safety certification*
- *Data protection & cybersecurity*

NRF AI Investigatorship

- Building upon NRF Fellowship in AI
- Seeks to attract outstanding researchers at the mid or established career stage to lead ground-breaking, high-risk research in the field of AI in Singapore
- \$3.25M grant over 5 years

NRF AI Fellows – Class 2019



Dr Angela Yao
NUS



Dr Arnab Bhattacharya
NUS



Dr Kuldeep Meel
NUS



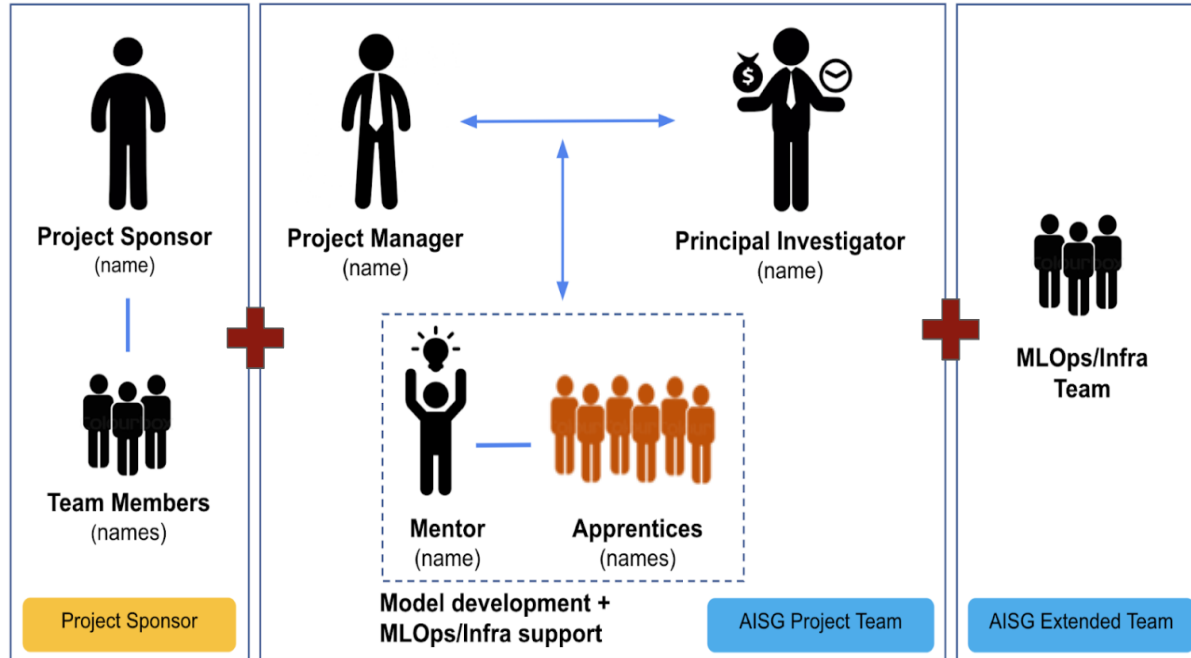
Rolling call for application now open

AISG PhD Fellowship Programme

- Nurture and train local AI talents to perform advanced fundamental AI
- Aims to increase Singapore's visibility and presence on AI fundamental research by publishing in top-tier AI conferences
- Allows participation in AISG initiatives such as 100E, AI Products, AI Grand Challenges

	Singaporean		PR		International	
	Count	%	Count	%	Count	%
Jan 2021 Call	1	25.0%	0	0.0%	3	75.0%
Aug 2021 Call	4	23.5%	2	11.7%	11	64.7%
Jan 2022 Call	1	9.1%	2	18.1%	8	72.7%
Aug 2023 Call	3	50.0%	0	0.0%	3	50.0%
Jan 2023 Call	1	14.3%	0	0.0%	6	85.7%
Overall	10	23.7%	4	10.5%	31	65.8%

AI Apprenticeship Programme



2 Months
Hybrid online & f2f mentoring self-directed learning

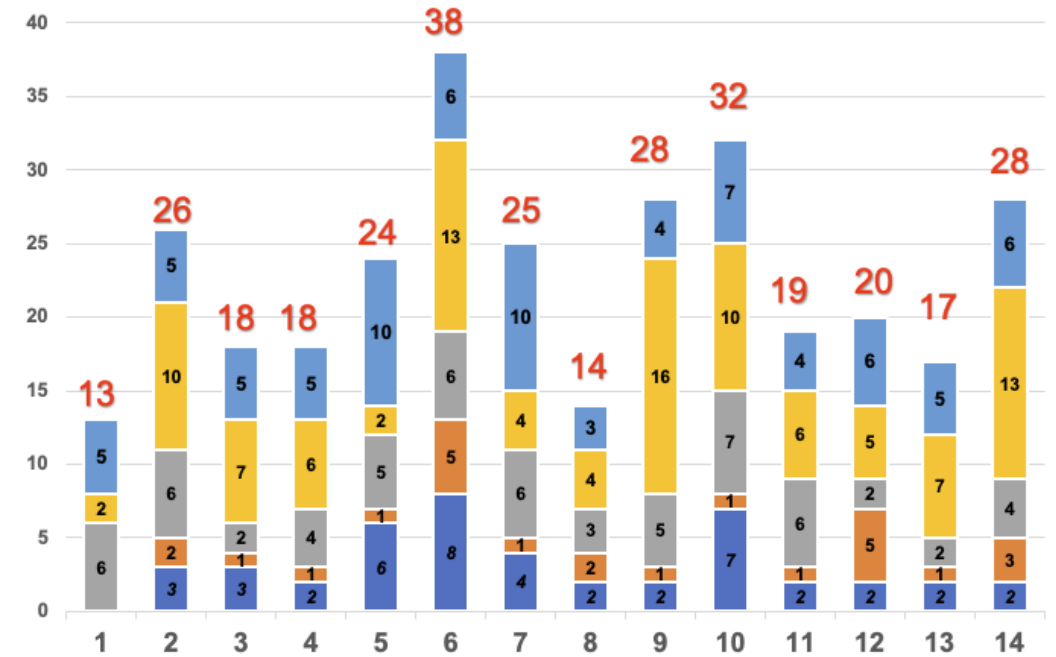
Start MVP Investigation and technology requirements

7 Months
MVM Development via multiple tracks with real-world AI projects

Real-world AI projects
\$360,000 - \$500,000

Certified AI Engineer
Back to Industry

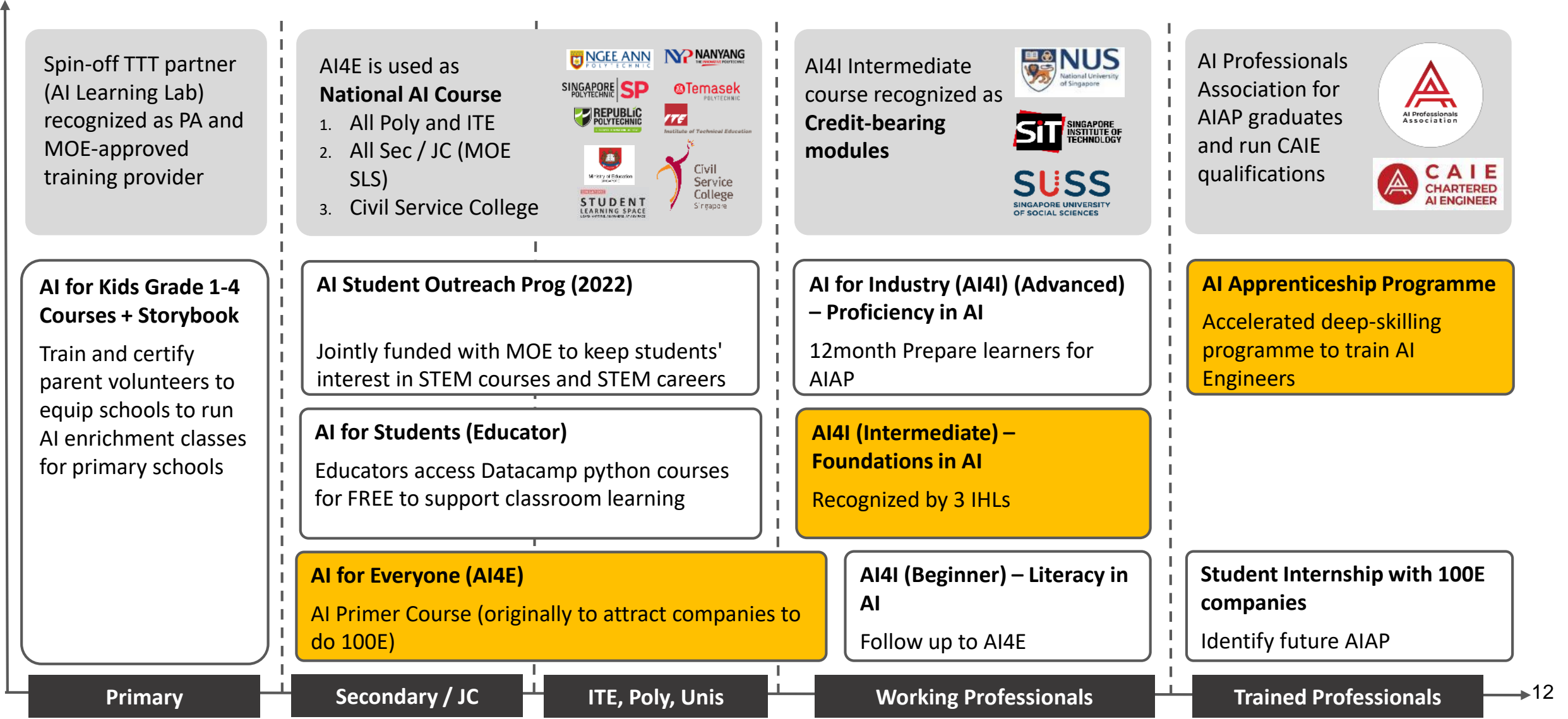
Total number of Apprentices = 320



- Science (Chemistry, Physics, Maths, etc) & Arts (Econs) **25%**
- Engineering (ME, EE, EEE, etc) **33%**
- Computer Science / Computer Engineering / ICT **20%**
- Arts / Social Sciences / Others **8%**
- Accountancy / Banking / Finance / Business / Data Analytics **14%**

Generational AI Talent Development

Growing AI Literacy and Proficiency in the Singapore Ecosystem





AI Impact

Mission:

Demonstrate the value of AI through social and economic outcomes

Activities:

- AI Grand Challenges
- AI Prize Challenges
- 100Experiments

Challenge-based Approach

1. AI Grand Challenges

- Using AI to solve **national-level** problems faced by Singapore

2. Prize-based Challenges

- World-wide competitions to push state-of-the-art of AI technologies for **specific problems of regional relevance**

Desired outcomes

- ✓ *Create significant economic and social impact with AI technologies*
- ✓ *Put Singapore on the AI world map with high-signature, high-impact projects*



AI Grand Challenges

Inspiring, impactful and measurable R&D programmes to solve national problems

AI in Health

How can AI help tackle 3H diseases (**Hyper-tension, Hyperlipidemia and Hyper-glycemia**) in Singapore?



Robust AI

How can we make AI systems on autonomous vehicles more robust **against adversarial attacks**?



AI in Education

How can AI help enhance mother tongue language learning (**Chinese, Malay and Tamil**) in Singapore?

AI in Health GC

How can Artificial Intelligence (AI) help primary care teams stop or slow disease progression and complication development in **3H – Hyperglycemia (diabetes), Hypertension (high blood pressure) and Hyperlipidemia (high cholesterol)** patients by 20% in 5 years?

AI in Health Grand Challenge

- Launched in 2018, 3 teams were selected for Stage 1, competing for Stage 2 (\$20M).
- JARVIS was eventually selected for Stage 2 (2021-2024)

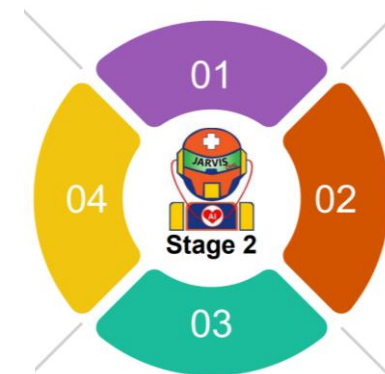
JARVIS

Lead-PI: Prof Wynne Hsu (NUS)



JARVIS Primary Care Counselling Tool

Jarvis Advanced Care Decision Support Tool



JARVIS Screening Tool

JARVIS - EMPOWER

AI in Education GC

How can AI enhance the **Mother Tongue Language (MTL)** learning environment at **home** for **Primary 1 & 2 students** to increase oral proficiency by 20% after 2 years?

Goal

Enable realistic, engaging, coherent and meaningful short conversations between AI and student based on the Picture Description Task



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Challenges

1. Speech recognition catered for **young children**.
2. Natural language processing tailored for **young children's linguistic characteristics and local contexts**.
3. Pedagogy-grounded, dialogue-based teaching and learning **suitable for young children**.

Robust AI GC

How can we design robust CV systems for AVs that can recover at least 80% of their original accuracy after physical testing-time adversarial attacks?



OBJECT DETECTION



STEREO DEPTH ESTIMATION



SEMANTIC SEGMENTATION

- 3 teams were awarded \$4M each from 2023 – 2026 to develop novel, real-world, adversarial attack against and defences for AI systems
- Team's attacks and defences will **red-teamed** against each other, and also by DSO
- AISG and DSO will embark on **real-world data collection** to build test environments based on SG local environment

Prize Challenges

Competitions that put AISG on the global research and innovation world map



Task: Develop AI models to accurately predict if a given video is real or fake

Supporting Partners:



Participation: ~600 individuals (~470 teams) from over 45 countries, including top universities like MIT, ETH Zurich etc.

More details can be found [here](#)



Task: Leveraging AI in FinTech to address real-world business needs:

Supporting Partners:

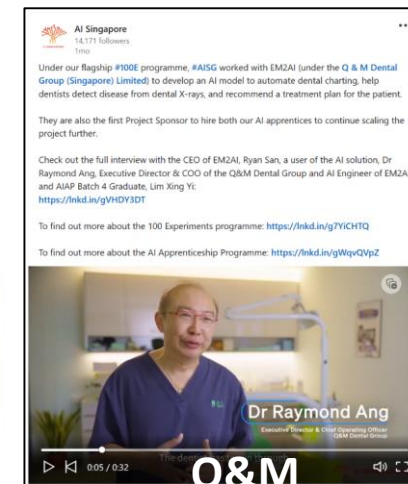
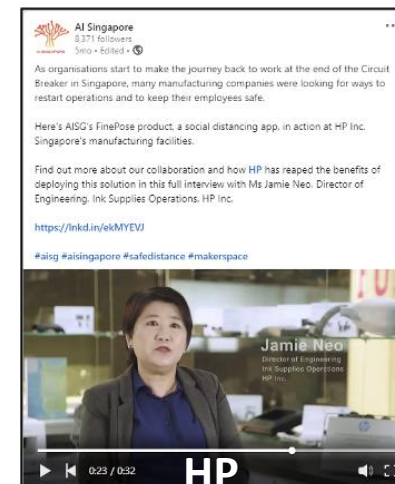
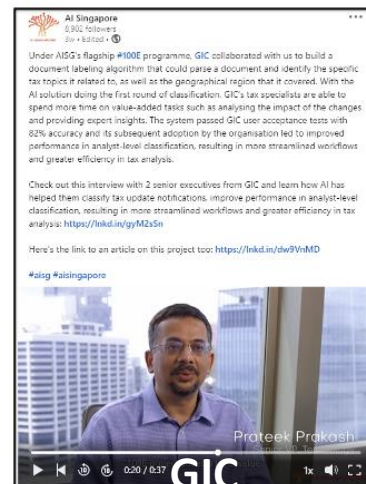
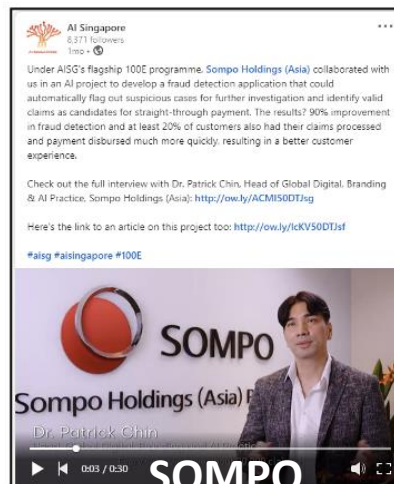
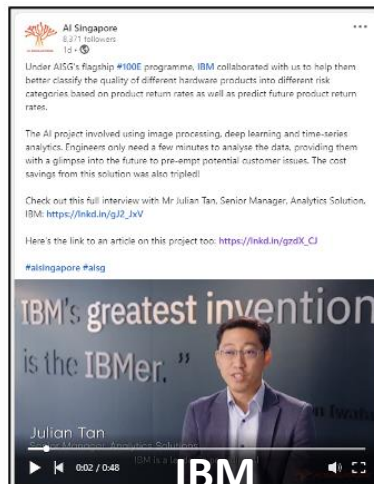


Participation: 150 submissions worldwide; 19 finalists showcased their solutions during Singapore FinTech Festival

More details can be found [here](#)

Real World Industry Projects Delivered

thru 100E + AIAP

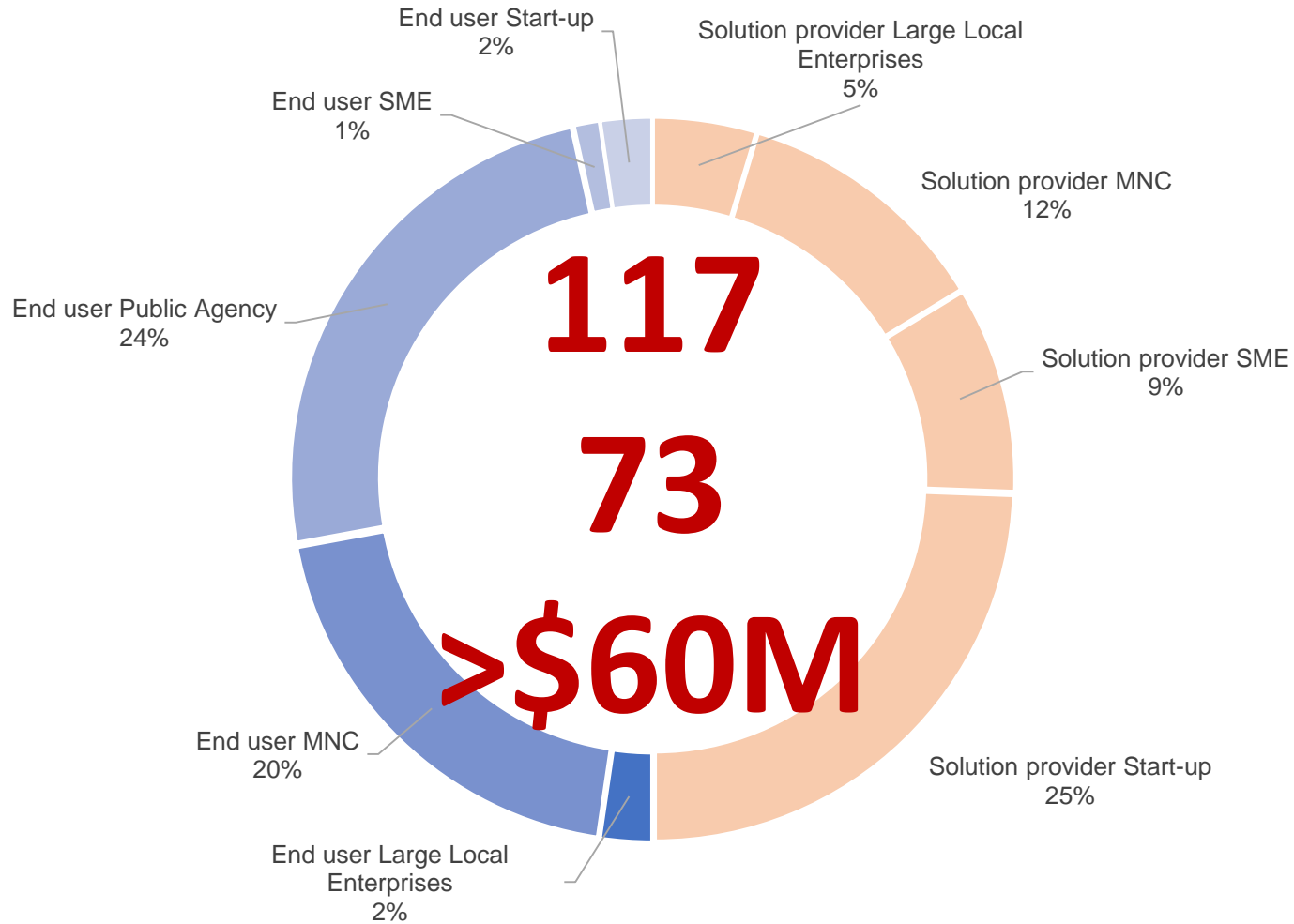


100E Projects

END USER: ~ 50%

SOLUTION PROVIDER: ~ 50%

Large Local Enterprises	Financial services
	Food...
	Electronics
MNC	Energy &...
	Financial services
	ICT and Media
	Others
Public Agency	Precision...
	Education
	Healthcare
SME	Public Agency
	Logistics
Start-up	Financial services
	Healthcare



Large Local Enterprises	Electronics
	Marine &...
	Others
MNC	Real Estate
	Electronics
	ICT and Media
	Marine &...
SME	Others
	Precision...
	Environmen...
Start-up	Financial...
	ICT and Media
	Professional...
Start-up	Electronics
	Healthcare
	ICT and Media
	Logistics

As of Nov 2023



AI ECOSYSTEM

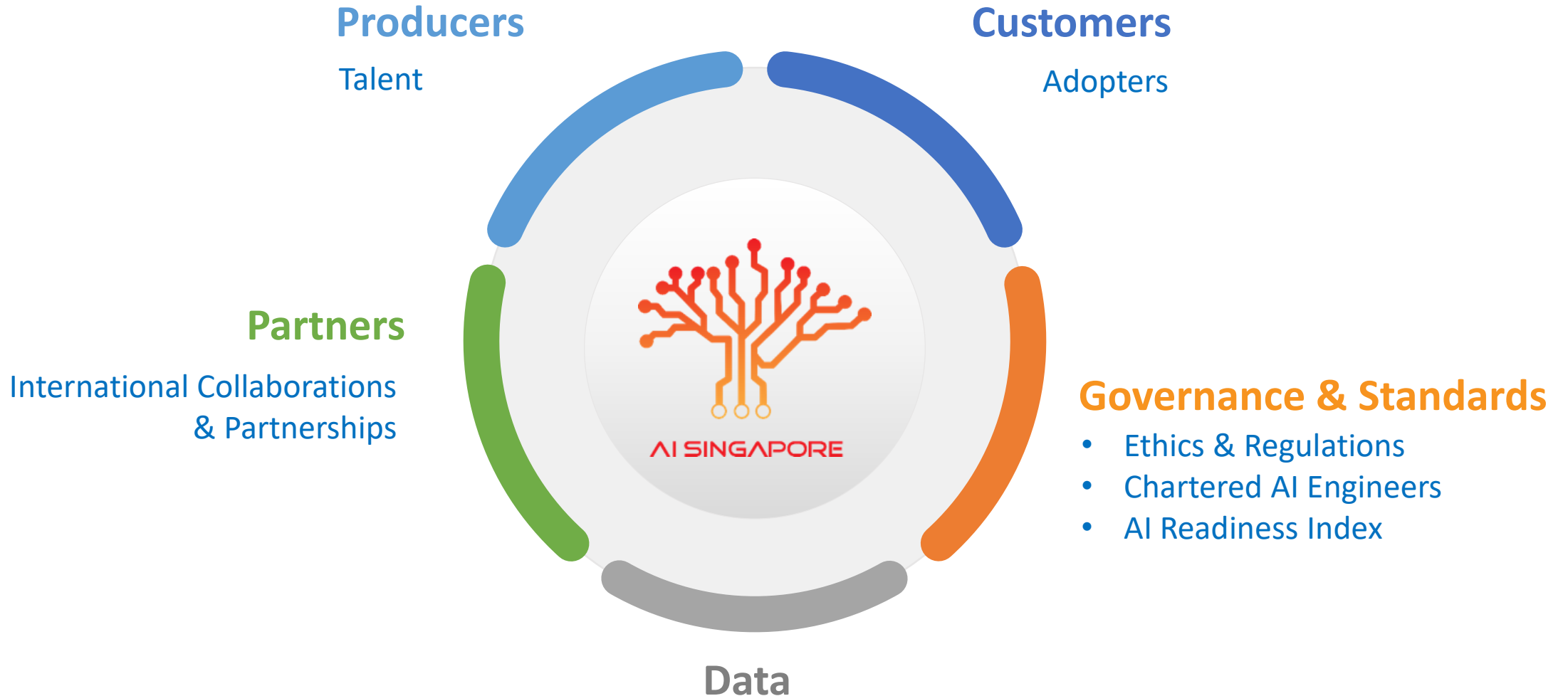
Mission:

Develop vibrant AI ecosystem for the nation

Activities:

- International Partnerships

Making Singapore A Trusted AI Hub



International Partnerships



AI for Net-Zero Energy Buildings

Singapore-South Korea Joint Grant Call between AISG and IITP



AI for Security and Fraud Prevention

Singapore-Israel Joint Grant Call between AISG and MOST

Thank You