

The background features a dark blue gradient with a network of white nodes and lines. In the top right, there's a blue Wi-Fi icon. At the bottom, there's a cityscape at night with three circular icons: an envelope, a speech bubble, and a computer monitor.

nodeflux

Vision AI Implementation

Solving Modern Problems in Indonesia

Faris Rahman, Co-Founder & CTO of Nodeflux

nodeflux.io

The Founders



Co-Founder & CEO
Meidy Fitranto

A technopreneur in his mission to contribute in bringing Indonesia forward. Meidy seek to generate impactful work that will sustain and leverage the quality of humanity. Innovate to solve problems has been his key driver to move forward and beyond.



Co-Founder & CTO
Faris Rahman

A Technopreneur with thought-leaderships and expertise in the field of distributed computation, high-performance computing, and artificial intelligence. Faris leverages his expertise by exploring advance technology to create impactful innovation that will bring greater good for societies at large.

Nodeflux Teams



Home for the brightest minds.

Esp Machine learning, Deep Learning, & Computer Vision.

S3



Adhiguna Mahendra, Ph.D

- Ph.D Université de Bourgogne
- Master Heriot-Watt University
- Bachelor Universitas Indonesia



Kahilil Muchtar, Ph.D

- Ph.D National Sun Yat-Sen University Taiwan
- MsC Asia University Taiwan



Igi Ardiyanto, Dr. Eng

- Dr. Eng. Toyohashi University of Technology (TUT), Japan.
- M. Eng. Toyohashi (TUT), Japan.

S2



Alvin P. Juniarta, M. Sc
MsC Chonnam National
University South Korea



M Rizky Munggaran, M. Eng
M. Eng Institut Teknologi
Bandung Indonesia



Alfin Syafalni, M. Sc
M.Sc. Universiti
Sains Malaysia



Randy Pangestu K, M.
Eng
M. Eng University of
Indonesia. Indonesia



Iman Rahmansyah T, M.
Eng
M. Eng. Kumoh National
Institute of Technology
South Korea



Richard Dharmadi, M. Sc
MSc University of
Edinburgh

S1





Vehicle Speed & Classification
JORR TB Simatupang, Jakarta



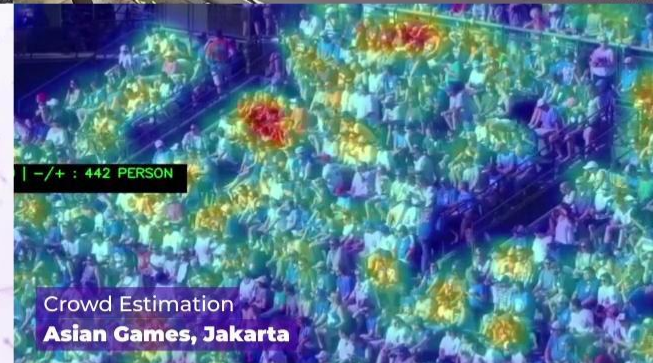
Illegal Parking - Dwelling Time
Jakarta Smart City, Jakarta



Fleet Detection - Ojek Online
Pluit, Jakarta

Dashboard for vehicle counting on a highway. It shows a live video feed of a multi-lane road with green bounding boxes around vehicles. Text overlays include 'LANE :0>> CAR: 54 | TRUCK: 5 | MOTORCYCLE: 0 | BUS: 7', 'Total Today 70', and 'Vehicle Classification - Today' with a bar chart.

Vehicle Counting
Jasa Marga Tol Dalkot, Jakarta



Crowd Estimation
Asian Games, Jakarta



Waste Monitoring
Sungai Citarum, Jawa Barat



Flood Monitoring
Bandung Smart City, Bandung



Trajectory Flow
Electronic City Store, Jakarta

nodeflux

MSPP Official Global Partner

Nodeflux is the only company from Indonesia among

24

Biggest AI company in the world



NIST Registered

Nodeflux also have received certification from National Institute of Standards and Technology

1

Indonesian AI company received certification



25

World's best from 90 Vision AI company around the world

Research

'What if?' is the main instigator of almost every technology marvel in human civilization. In order to distil feasible 'what ifs', exploration through research and development (R&D) is necessary. Through R&D activities, we expect a great flow of ideas, knowledge, motivation, and countless opportunity to escalate the nation's resources quality.

Read the article here

2018



Best Presenter Awards on *The 3rd International Conference on Computer Science and Computational Intelligence (ICCSCI) 2018* Tangerang, West Java, Indonesia for The 1st Nodeflux Paper: **"An Improved Version of Texture-based Foreground Segmentation: Block-based Adaptive Segmenter"** by Kahlil Muchtar, Faris Rahman, Tjeng Wawan Cenggoro, Arif Budiarto, & Bens Pardamean.

Read the article here

2019



ICAIIIC (International Conference on AI in information and communication) 2019, Okinawa, Japan. **"A unified smart surveillance system incorporating adaptive foreground extraction and deep learning-based classification."** by Kahlil Muchtar, Faris Rahman, Muhammad Rizky Munggaran, Alvin Prayuda Juniarta Dwiyantoro, Richard Dharmadi, & Indra Nugraha.

Read the article here

2018



Outstanding Paper Awards on *The 23rd International Computer Symposium (ICS) 2018* Yunlin, Taiwan. **"An efficient event detection through background subtraction and deep convolutional nets"** by Kahlil Muchtar, Faris Rahman, Muhammad Rizky Munggaran, Alvin Prayuda Juniarta Dwiyantoro, Richard Dharmadi, Indra Nugraha, & Chuan-Yu Chang.

Read the article here

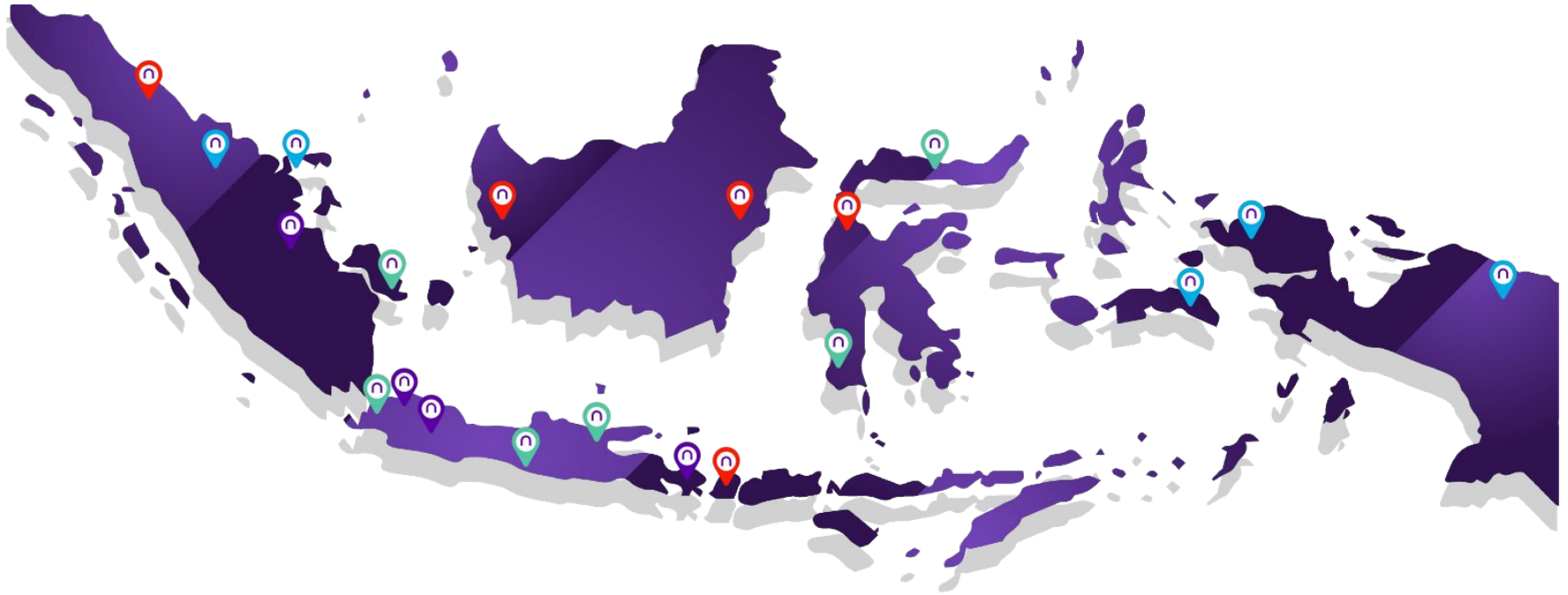
2019



IEEE (Institute of Electrical and Electronics Engineers) Transactions on Intelligent Transportation Systems (Q1 journal, Impact Factor: 4.051). **"Moving Object Detection through Image Bit-Planes Representation without Thresholding."** by Chih-Yang Lin, Kahlil Muchtar, Wei-Yang Lin, & Zhi-Yao Jian.

nodeflux

Implementation



2018 AI Implementation



2019 AI Implementation



On Progress Deploy



Planning Deploy



Face Recognition



License Plate Recognition



Sidewalk Vendor Detection



People Counting



Vehicle Counting



Water Level



People Dwelling



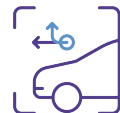
Vehicle Dwelling



Face Enrollment Service



People Trajectory



Vehicle Trajectory



Crowd Estimation



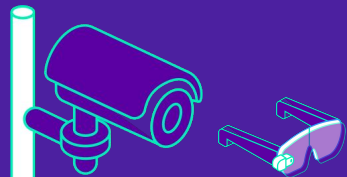
Vehicle Intrusion



Crowd Anomaly Behaviour



Vehicle Speed



RealTime Analytics



ASIAN GAMES | 2018
Jakarta Palembang

Success Story: Asian Games 2018

Asian Games 2018 is an international sporting event that is the pride of the Indonesian Nation. It takes careful preparation and strict security to ensure this event goes on smoothly. Nodexflux is entrusted to assist the Indonesian National Police and organizers of the 2018 Asian Games in securing safety.

With VisionAlre as the leading platform and interconnection with data from Dukcapil, Nodexflux can present an integrated solution to answer various challenges during the 2018 Asian Games, especially in terms of securing and analyzing 2018 Asian Games visitors.





Success Story: Indonesian Civil Registry Office (Dukcapil) Data Integrator for Indonesian National Police (POLRI)

Trusted to be the data integrator for Dukcapil for security purposes by the National Police is one of Nodeflux's most significant achievements as a company. Nodeflux holds a key role in connecting the Polri system that is already running with population data in the Dukcapil database.

As a result, integration by Nodeflux enables the National Police to search for data based on facial characteristics with a high degree of accuracy. Through this integration, VisionAlre, as a platform, can also learn from more cases and search queries (queries).



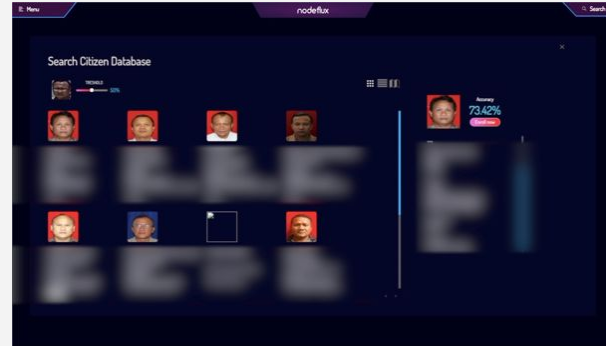
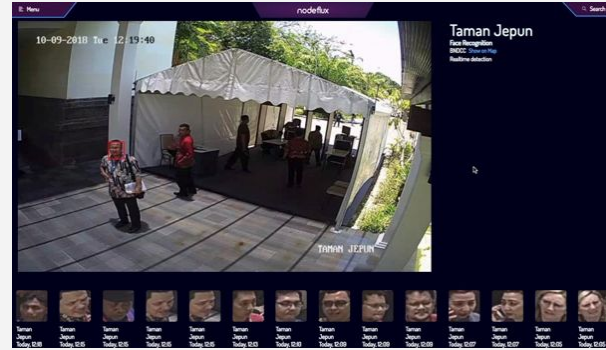


ANNUAL MEETINGS
2018 | indonesia
INTERNATIONAL MONETARY FUND
WORLD BANK GROUP

Success Story: IMF Annual Meeting 2018

Events with a scale as large as the 2018 Annual IMF Meeting have their challenges. Tight security is an essential requirement, especially since guests who come are leaders from various countries in the world. Nodeflux is again involved in providing face recognition services with data connected to Dukcapil.

To secure the 2018 IMF Annual Meeting, Nodeflux became an integration partner of the National Police. Nodeflux provides the entire security dashboard that uses artificial intelligence on VisionAlre as our artificial intelligence platform.





Success Story: Jakarta Smart City

Jakarta is one of the most extensive playgrounds for Nodeflux. The cooperation between the Provincial Government of DKI Jakarta is an excellent opportunity for Nodeflux to implement some of the best solutions based on VisionAIre.

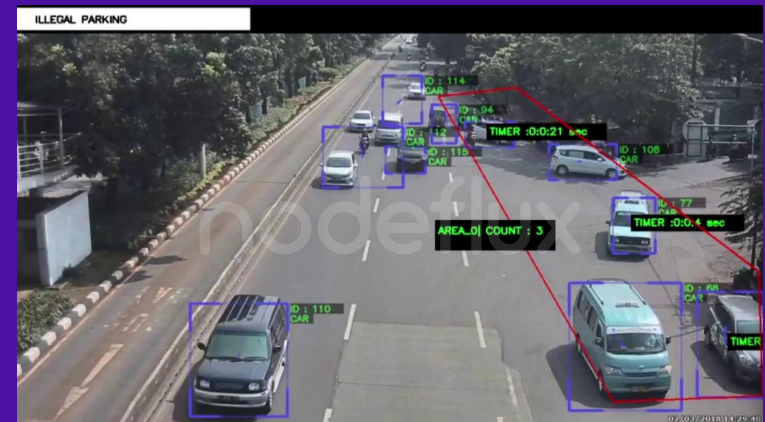
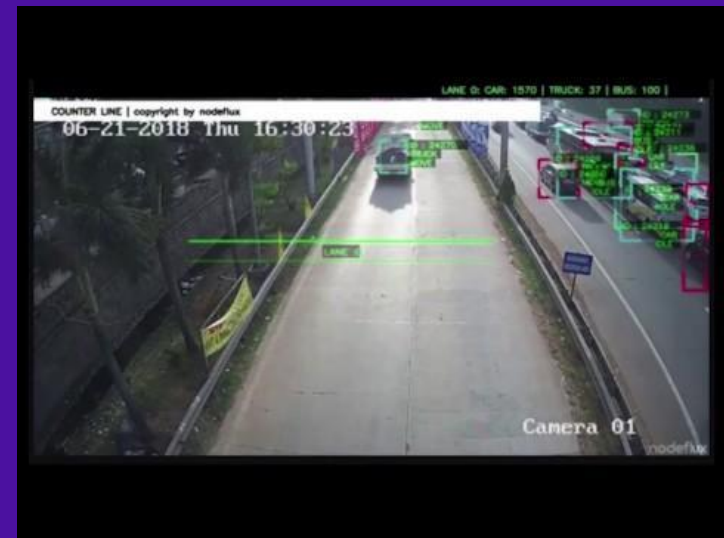
The last implementation that was also supported by the signing of the MoU with the DKI Jakarta Provincial Government was the Jakarta Tax Initiative, where the solution from Nodeflux was used to bring direct benefits to the government in the form of increased motor vehicle tax revenues. This initiative will be followed by other types of implementation in DKI Jakarta, and similar deployments in other cities in Indonesia.



Road Traffic Monitoring

■

A visual processing system that carries out real-time traffic monitoring and reduces the chance of congestion with actual data support.



Sidewalk Vending Observation

A system that detects the activities of street vendors through their visual characteristics to provide an early warning system for related parties to take necessary action.



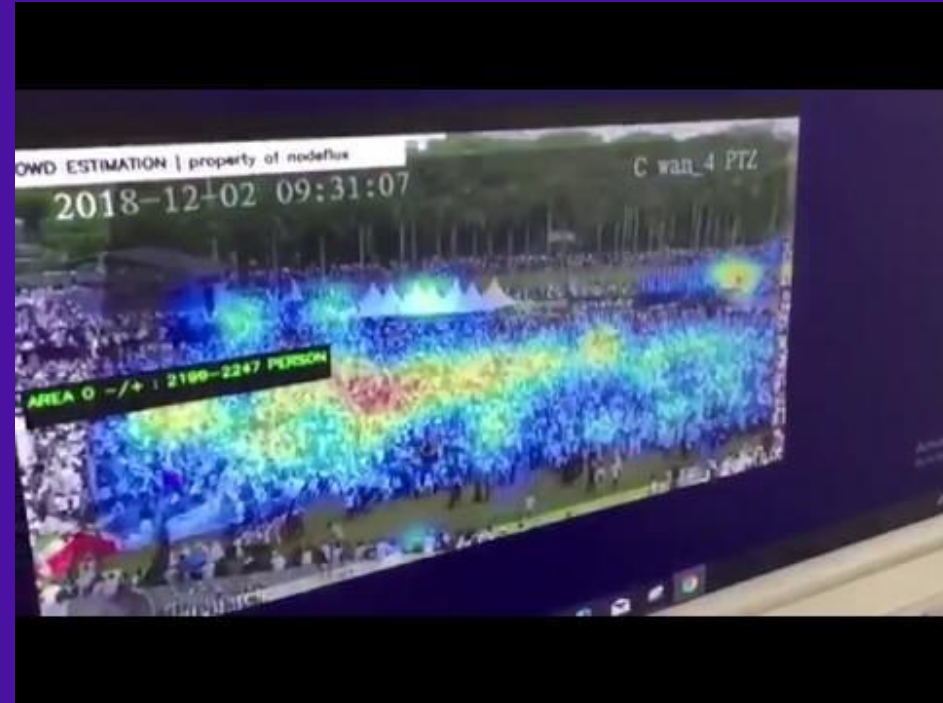
Blacklisted Person Surveillance

A system made to identify the blacklisted people to provide better public security.



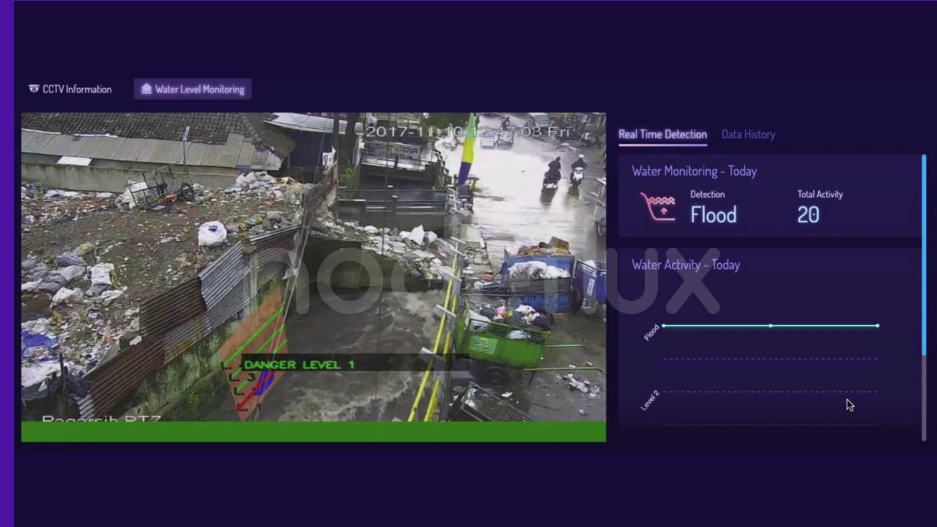
Mass Traffic Surveillance

A system made to estimate the number of headcounts in a crowd.



Water Level Monitoring

System for detecting the level of water, with the goal to give immediate alerts to anticipate flooding



Ojek Online / Online Ride Hailing

Ojek Online run our vehicle counting with online ride hailing detection and passenger classification.



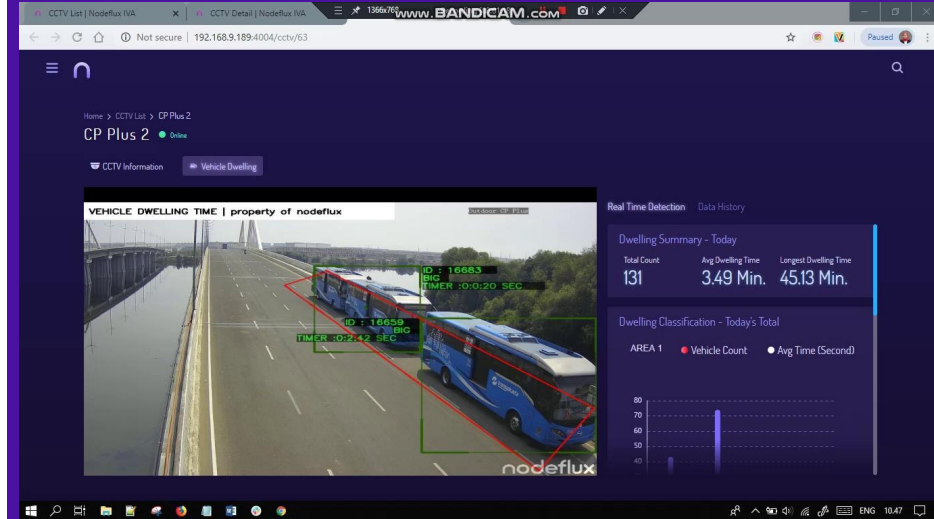
Solid Waste Monitoring

A real-time system to detect solid waste on the river



Vehicle Intrusion

A system made to identify trespassing vehicle's length of time on a prohibited lane according to regulation, to provide an early warning system for enforcement action by authorities.



Visitor Counter

A real-time system made to identify and to calculate visitors who enter and exit the recreation area.



Visitor Hotspot Area Detection

A system made to calculate the number of visitors and to estimate the duration of visit in a particular area. The generated data will be a useful reference for evaluation material and strategic space planning.



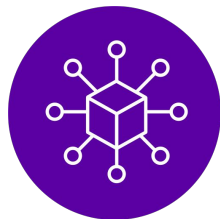
End to End | nodeflux



Data Acquisition



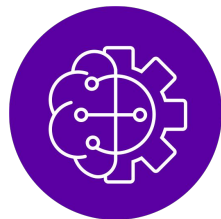
Gathering the image data.
Store it.



Data Annotation



Giving **label** to each data, according to the **annotation policy**.

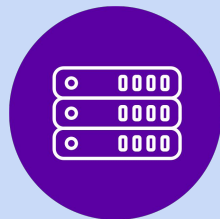


Training



Train the **model**, generate further **analytics** based on the model, other **modules** and **rules**.

Basically, create **workers**.



Platform



Place to run the analytics. With its very own **system architecture**, ready to be deployed on several **deployment**.

Serve **integrations** to other platform or solutions.

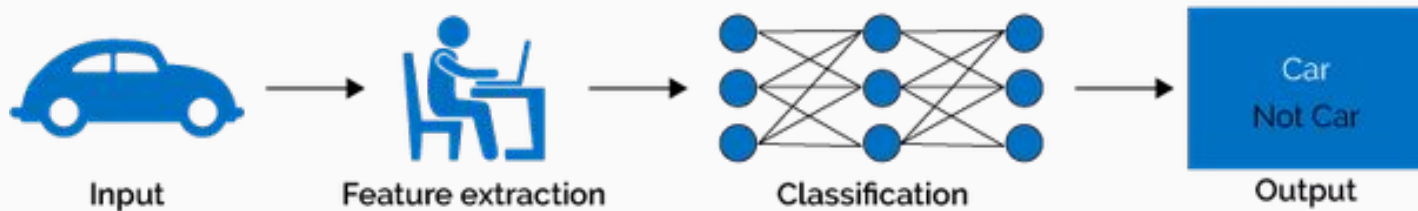


Solution

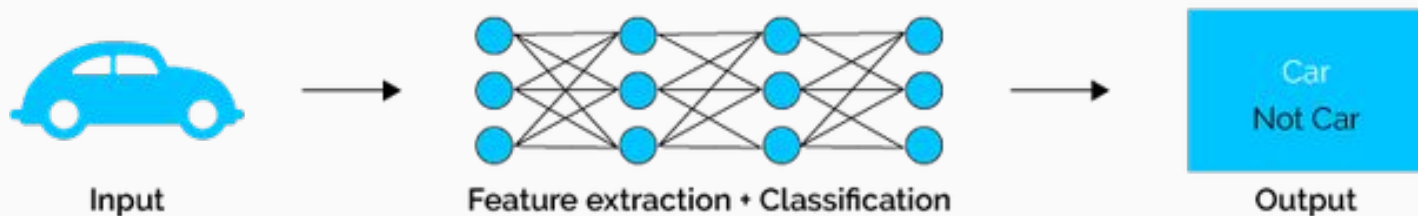


Deliver value to clients, using Data from the platform for further needs and customisation. Become **use cases**.

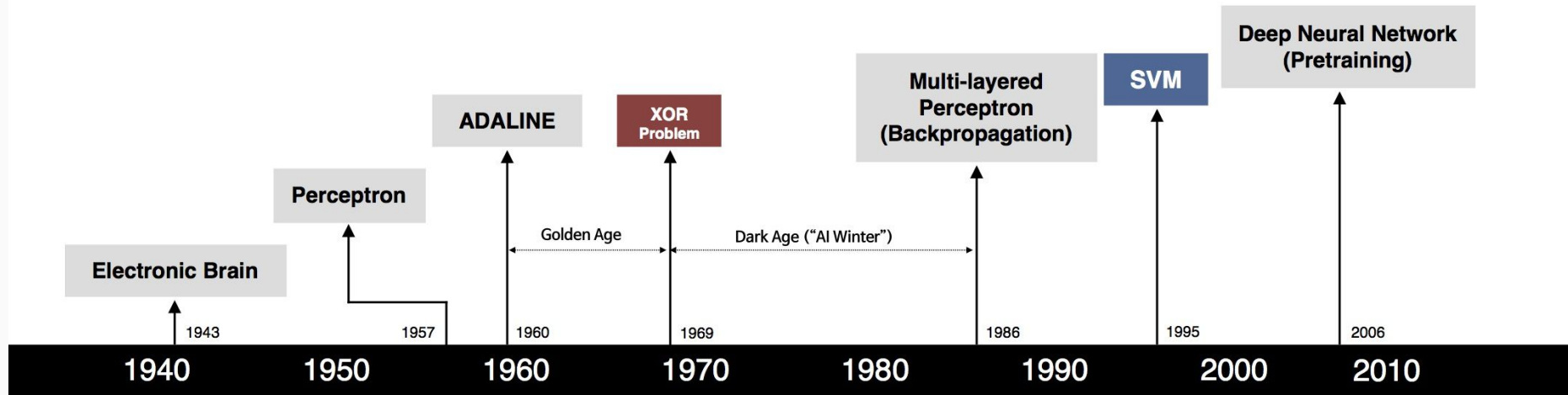
Machine Learning



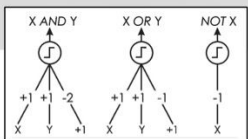
Deep Learning



History in The Making



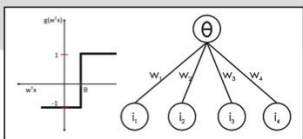
S. McCulloch – W. Pitts



- Adjustable Weights
- Weights are not Learned



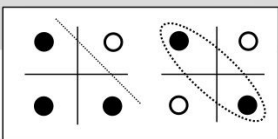
F. Rosenblatt B. Widrow – M. Hoff



- Learnable Weights and Threshold



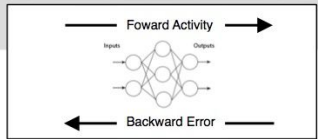
M. Minsky – S. Papert



- XOR Problem



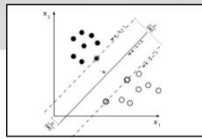
D. Rumelhart – G. Hinton – R. Williams



- Solution to nonlinearly separable problems
- Big computation, local optima and overfitting



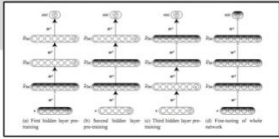
V. Vapnik – C. Cortes



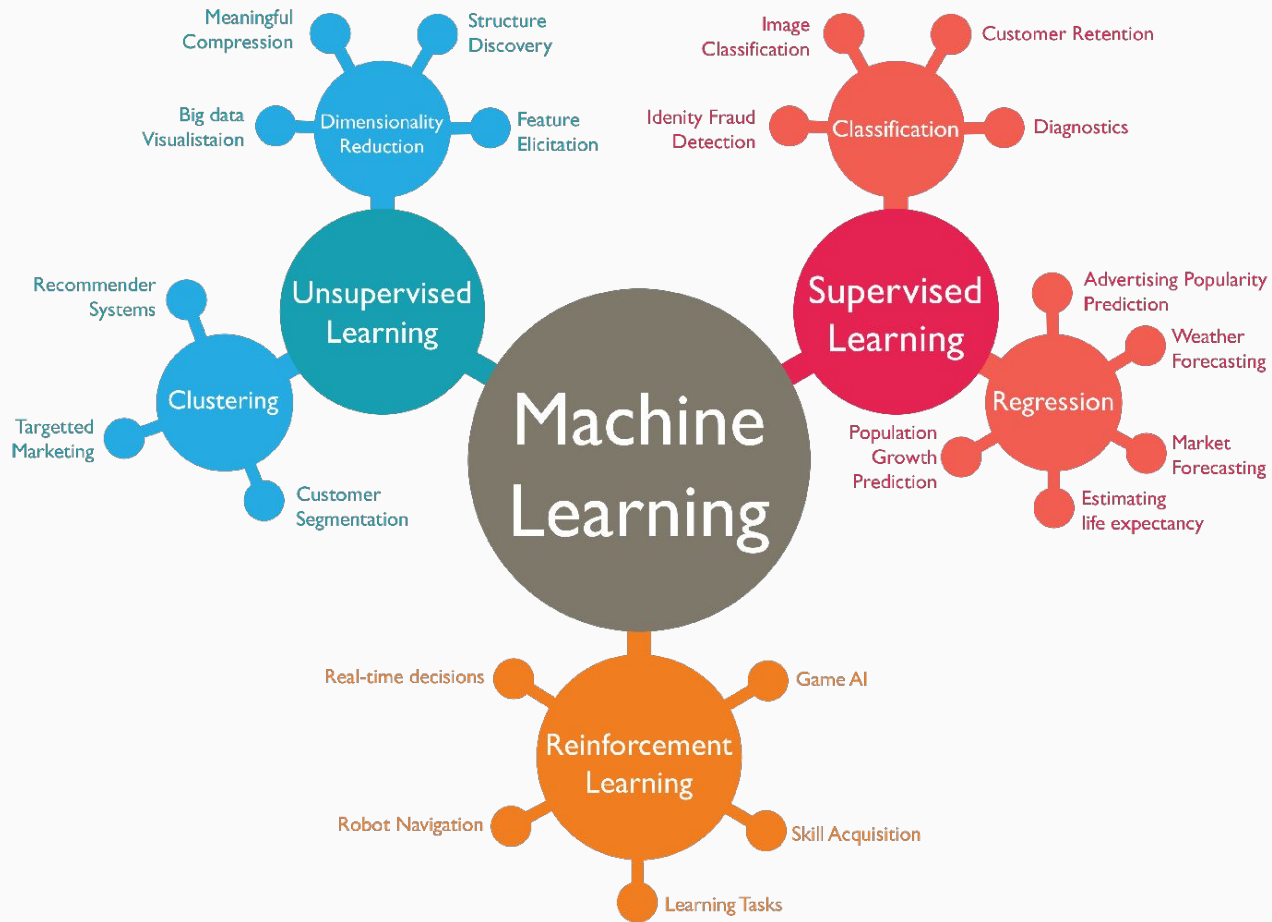
- Limitations of learning prior knowledge
- Kernel function: Human Intervention



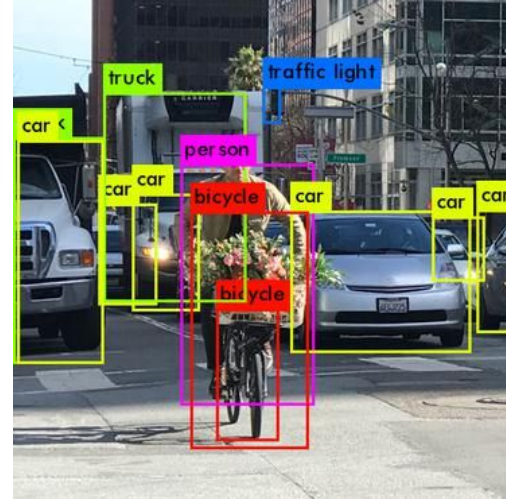
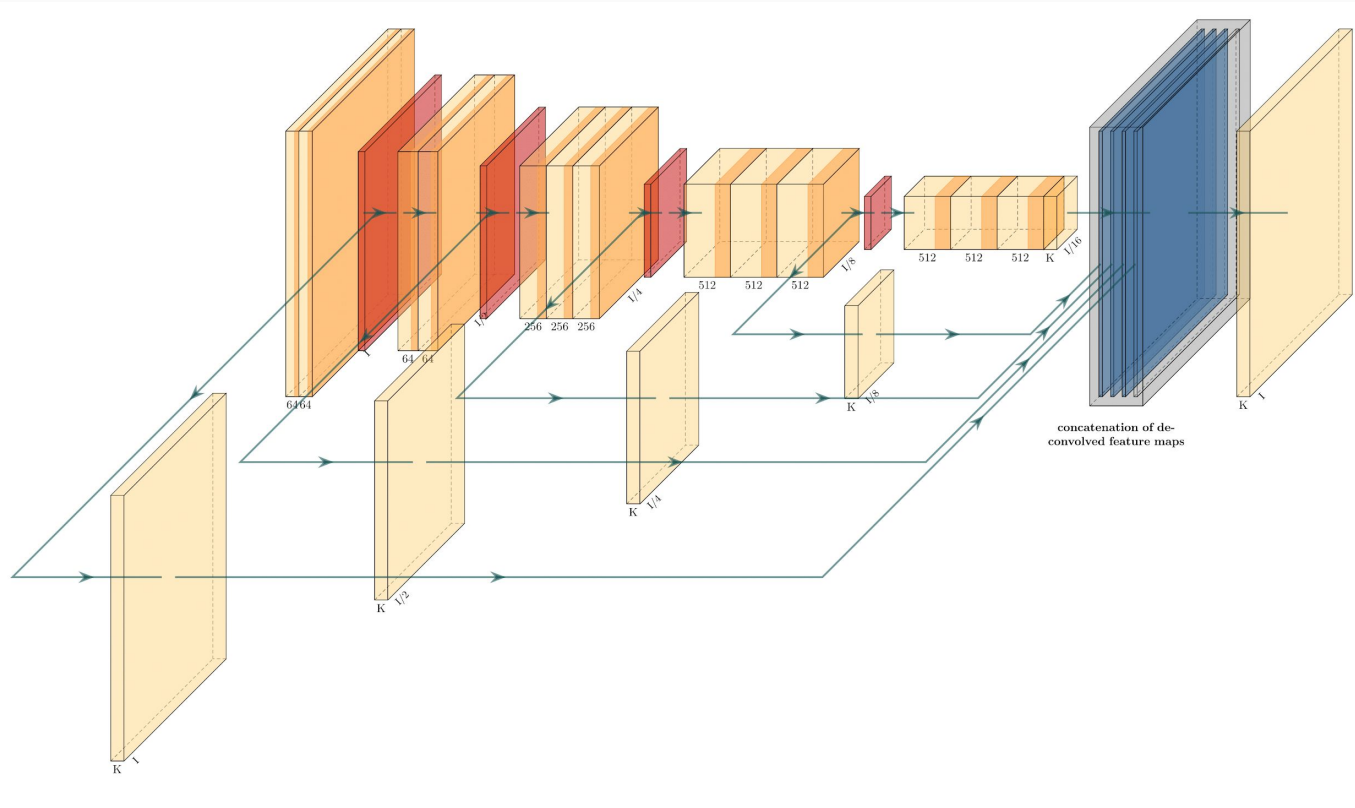
G. Hinton – S. Ruslan



- Hierarchical feature Learning



Why we call it Deep Learning Architecture





TOTAL
POPULATION



262 million
URBANISATION
55%

INTERNET
USERS



132.7 million
PENETRATION
51%

ACTIVE SOCIAL
MEDIA USERS



106 million
PENETRATION
40%

TOTAL ACTIVE MOBILE
INTERNET USERS



123.3 million

NUMBER OF INTERNET
USERS



47% of total population

TANPA INDONESIA 3 STARTUP INI TIDAK JADI UNICORN



Negara Asia Tenggara telah melahirkan setidaknya tujuh unicorn atau perusahaan startup yang memiliki valuasi di atas **US\$ 1 miliar**.

STARTUP DI ASIA TENGGARA

SINGAPURA



STARTUP ASING DI INDONESIA

Shopee

Bergerak di bidang
Belanja online



Bergerak di bidang
transportasi
online terbesar
di Indonesia.

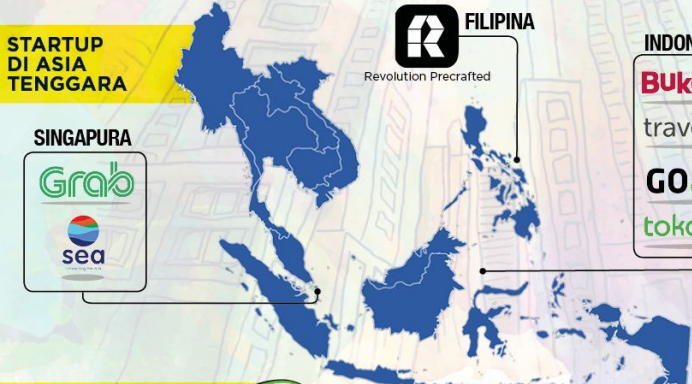


kontributor utama
Unicorn Singapura
dan Malaysia
adalah Indonesia.

Rudiantara
Kementerian Komunikasi dan Informatika
Republik Indonesia



Bergerak di bidang
Game dan hiburan



FILIPINA
Revolution Precrafted

INDONESIA
Bukalapak
traveloka
GOJEK
tokopedia

4 UNICORN RAKSASA INDONESIA

GOJEK
Pendiri: Nadiem Makarim
Investor: Google, Tencent Holdings, KCB, Warburg Pincus, Sequoia Capital, NSI Ventures, Northstar Group, JD.com, DST Global, PT. Astra International Tbk.

NILAI VALUASI
Rp 136 T

Asal Investor:

TOKOPEDIA
Pendiri: William Tanuwijaya

Investor: Alibaba, Softbank, East Ventures, Cyber Agent Ventures, Beano, Sequoia Capital.

NILAI VALUASI
Rp 102 T

Asal Investor:

TRAVELOKA
Pendiri: Ferry Umarid

Investor: Expedia, GFC dan Sequoia Capital, Hillhouse Capital dan JD.com

NILAI VALUASI
Rp 26,6 T

Asal Investor:

BL BUKALAPAK
Pendiri: Achmad Zaky

Investor: EMTK Group, Ant Financial, Mirae Asset, Naver Asia GIC.

NILAI VALUASI
Rp 14 T

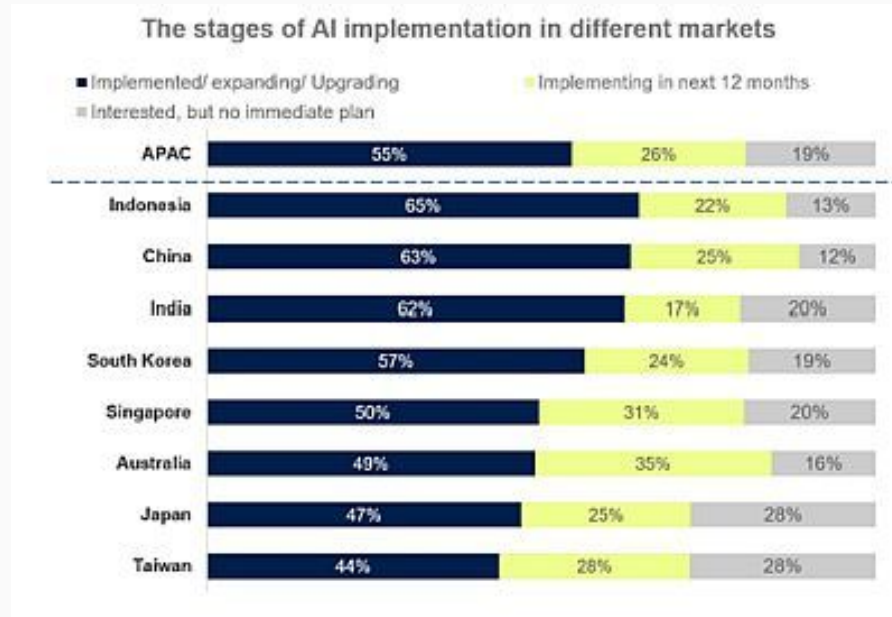
Asal Investor:

Para Unicorn di Indonesia (total pendanaan)

| GOJEK | Tokopedia | traveloka | Bukalapak |
|--|---|--|---|
| <p>Go-Jek US\$1,75 miliar</p> <p>4 Mei 2017</p> <p>US\$1,2 miliar (Tencent Holding & JD.com)</p> <p>4 Agustus 2017</p> <p>US\$550 juta (Sequoia, Warburg, & 8 investor lain)</p> <p>15 Oktober 2015</p> <p>Dirahasiakan (Sequoia, DST Global, & NSI Venture)</p> | <p>Tokopedia US\$1,347 miliar</p> <p>17 Agustus 2017</p> <p>US\$1,1 miliar (Alibaba)</p> <p>11 April 2016</p> <p>US\$147 juta</p> <p>21 Oktober 2014</p> <p>US\$100 juta (Softbank)</p> <p>12 Juni 2013</p> <p>Dirahasiakan (Softbank)</p> <p>4 April 2012</p> <p>Dirahasiakan (Beenos Partner)</p> <p>19 April 2011</p> <p>US\$ 700 ribu (CyberAgent)</p> <p>15 Maret 2010</p> <p>Dirahasiakan (East Ventures)</p> | <p>Traveloka US\$500 juta</p> <p>27 Juli 2017</p> <p>US\$350 juta (Expedia)</p> <p>1 Januari 2017</p> <p>US\$150 juta (Sequoia, East Venture, JD.com, & Hillhouse Capital)</p> <p>15 Agustus 2013</p> <p>Dirahasiakan (Global Founder)</p> <p>12 November 2012</p> <p>Dirahasiakan (East Ventures)</p> | <p>Bukalapak Tidak diketahui*</p> <p>4 Februari 2015</p> <p>Dirahasiakan (500 Startup & QueensBridge)</p> <p>11 September 2012</p> <p>Dirahasiakan (Gree Venture)</p> |

Ket*:
belum memberikan
keterangan tentang
investasi yang
mengantarkannya
menjadi unicorn

The study, conducted by Forrester Consulting on behalf technology company Appier, aims to shed light on trends in AI adoption across the Asia-Pacific.



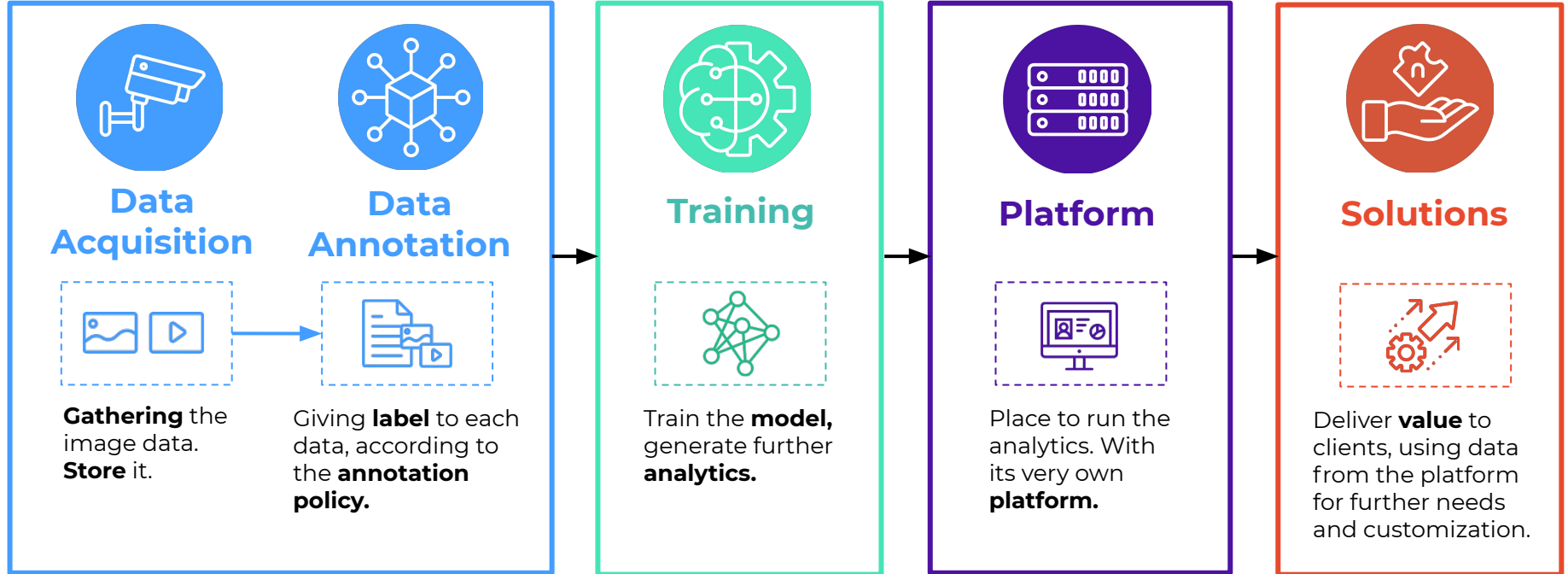
AI in Trend 2019

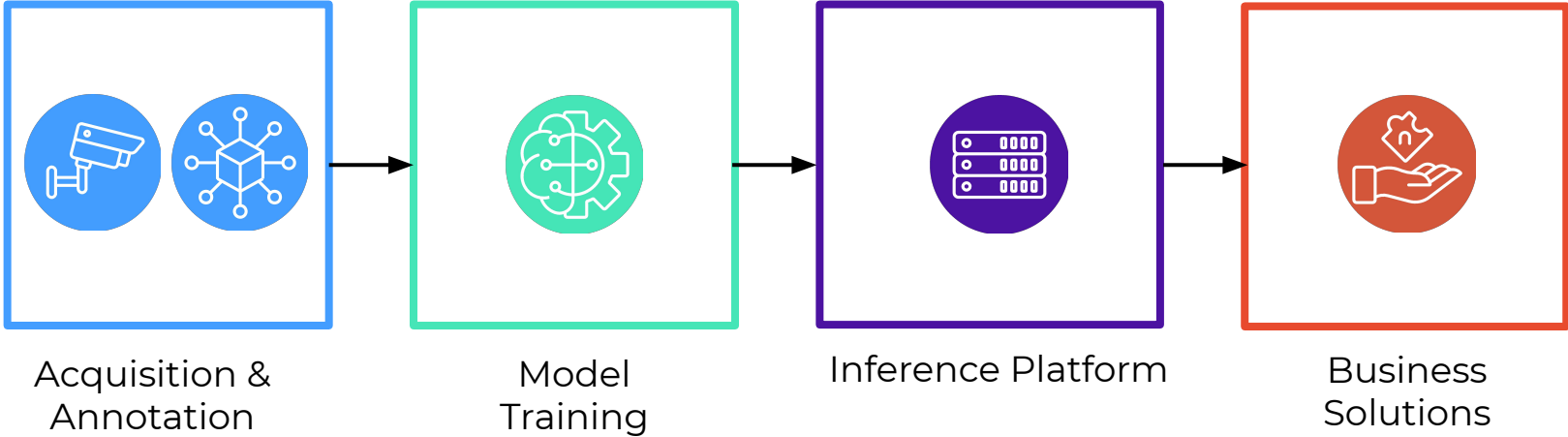


ECOSYSTEM



Technology





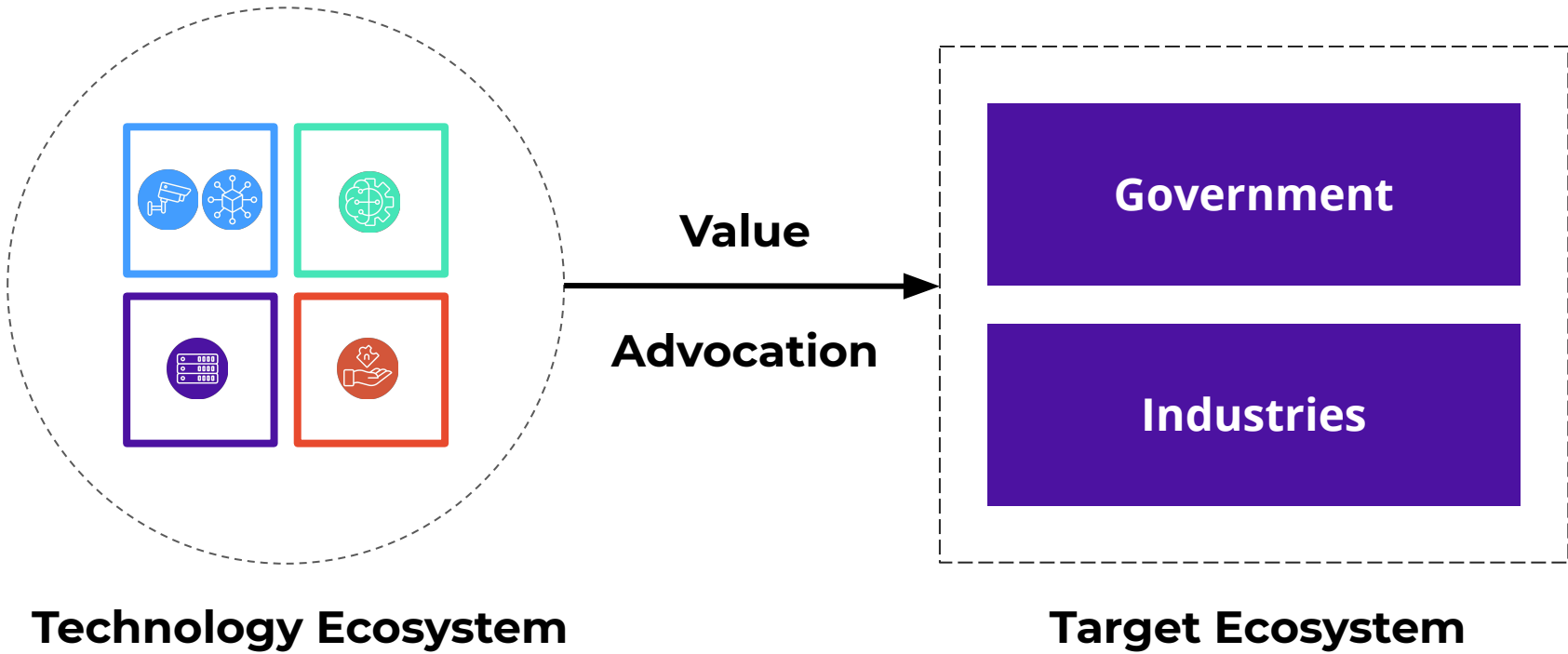
Collaboration

Local Communities
(Crowdsource, data-labelling)

Academics and Tech Communities
(Curriculum in AI, model training and development)

Hardware Vendors
(Technology)

Solution Integrator
(Industry)



Technology Ecosystem

Target Ecosystem

Thank you



www.nodeflux.io