

# HYPERLEAP

39th National Conference of  
Chartered Accountants

## WALK WITH DIGITAL DISRUPTION

Adapting to a world with Artificial Intelligence

**Dr. Romesh Ranawana**





**KANDY**





**TRINITY COLLEGE**





**UNIVERSITY OF PERADENIYA**





**UNIVERSITY OF OXFORD**





**OXFORD**





**COLOMBO**





## **SIMULATIONS**

We are a Simulation Technology company



## **GLOBAL**

We have a global customer base



## **PRODUCTS**

We develop only commercial off-the-shelf (COTS) products



## **IP**

We focus on the development of software which adds to our own IP



## **SRI LANKAN BASE OF OPERATIONS**

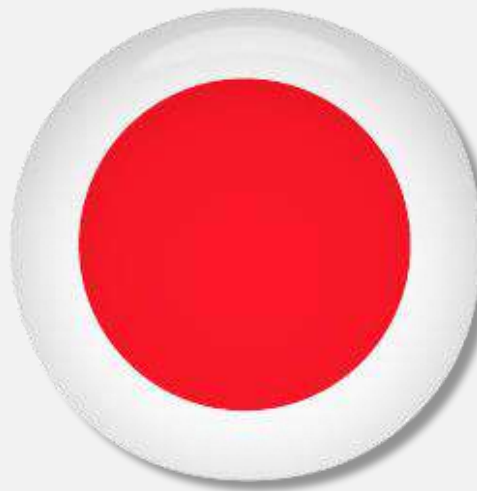
All research, development, maintenance and support is done at our Sri Lankan office







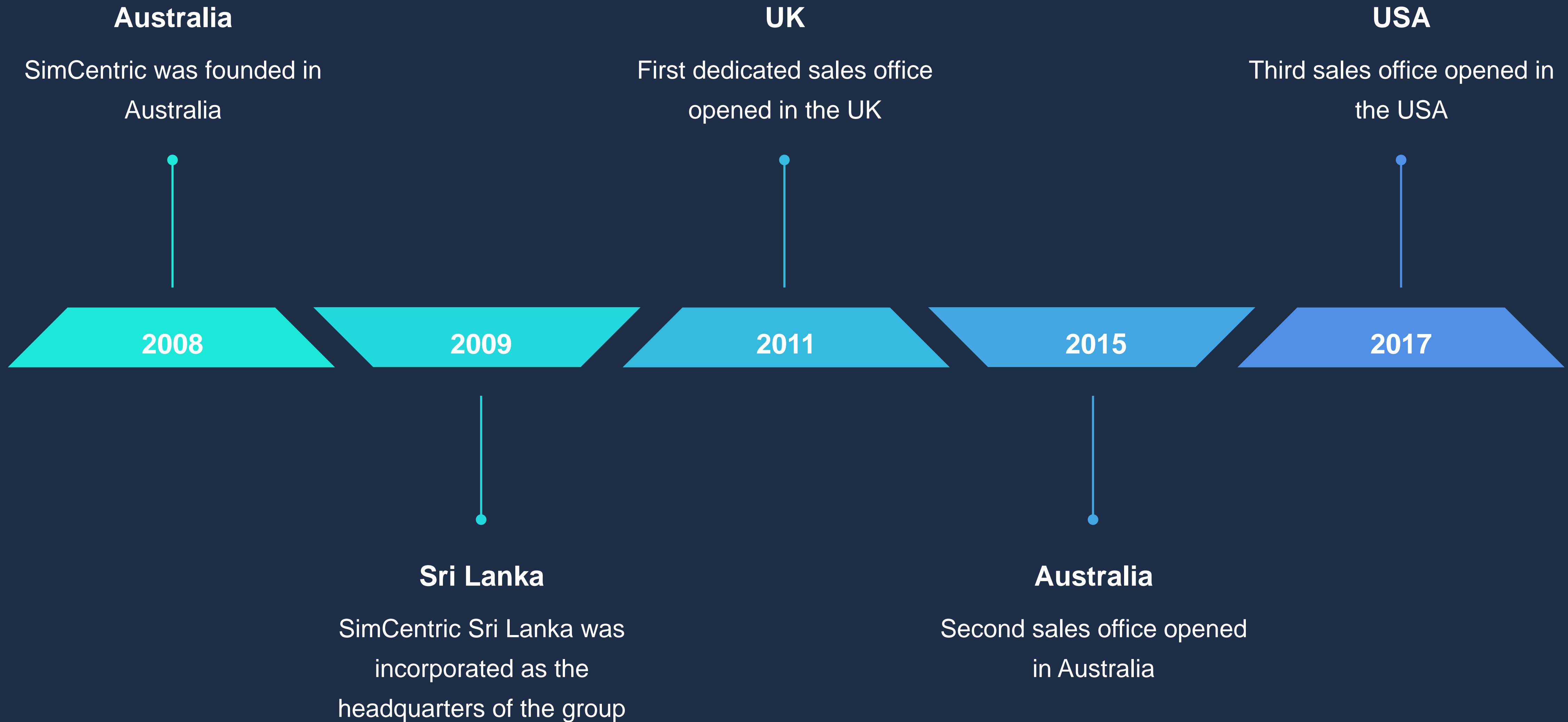
# MILITARY USERS







# THE SIMCENTRIC GROUP

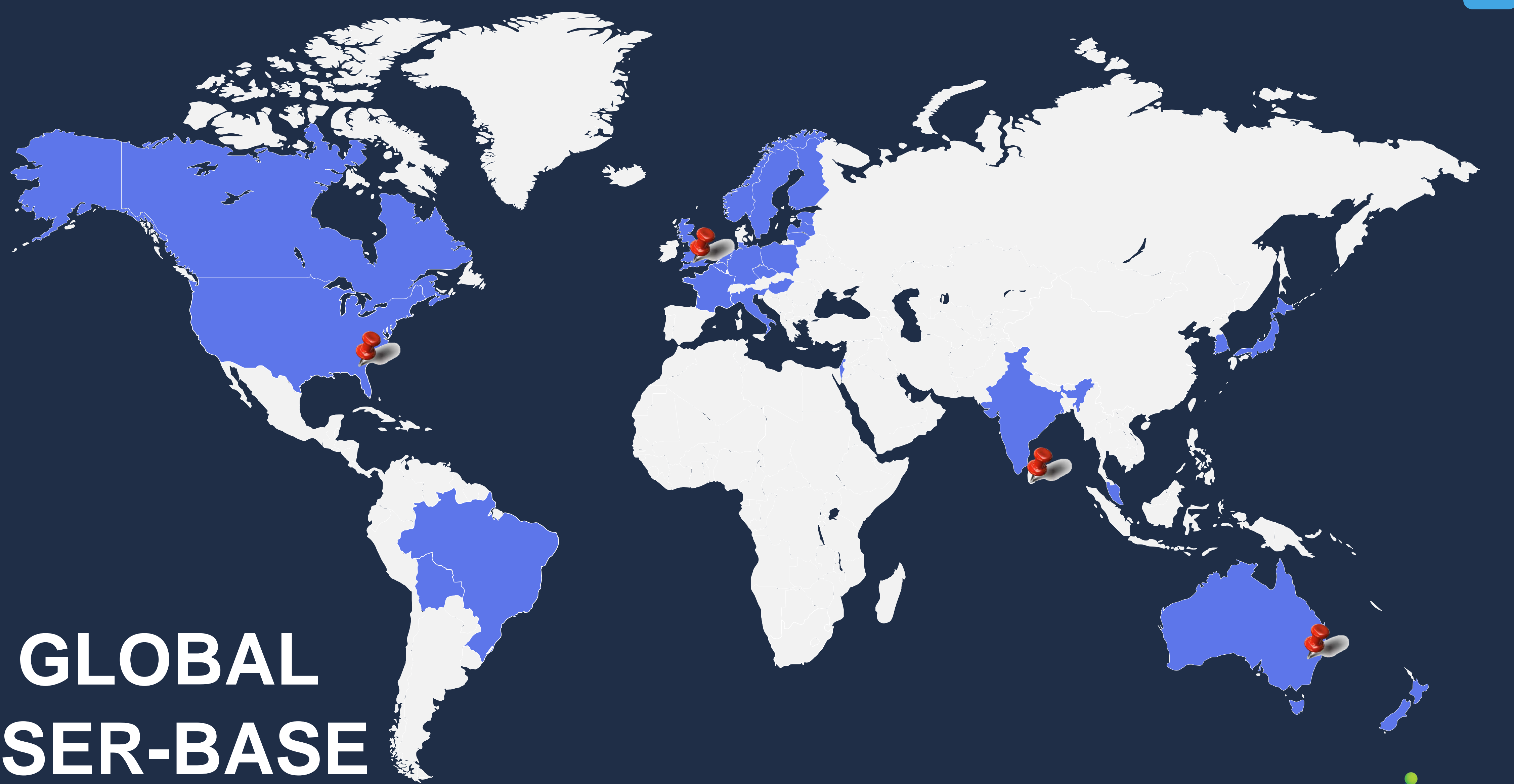






**A GLOBAL  
COMPANY**





**A GLOBAL  
USER-BASE**



# HOW OUR PRODUCTS ARE USED

**SIMULATION BATTLE LABS**



**PART OF LARGER SIMULATOR SYSTEMS**



**VR AND AR SYSTEMS**

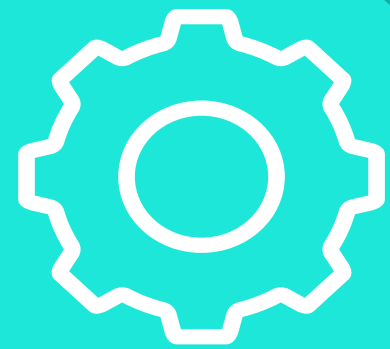


**360° OR 180° DOMES**





# PRODUCTS



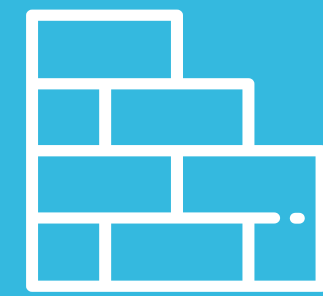
## SPECIALISED SIMULATORS

Specialized simulator environments and sandboxes for training call-for-fire, call-for-airstrike and gun-range safety



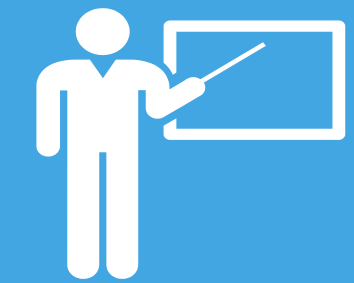
## SIMULATOR ADD-ONS

Bolt-on add-ons to add crowds and traffic to any simulation environment



## SIMULATION MIDDLEWARE

Execution engines, application programming interfaces (APIs) and tools for building simulations

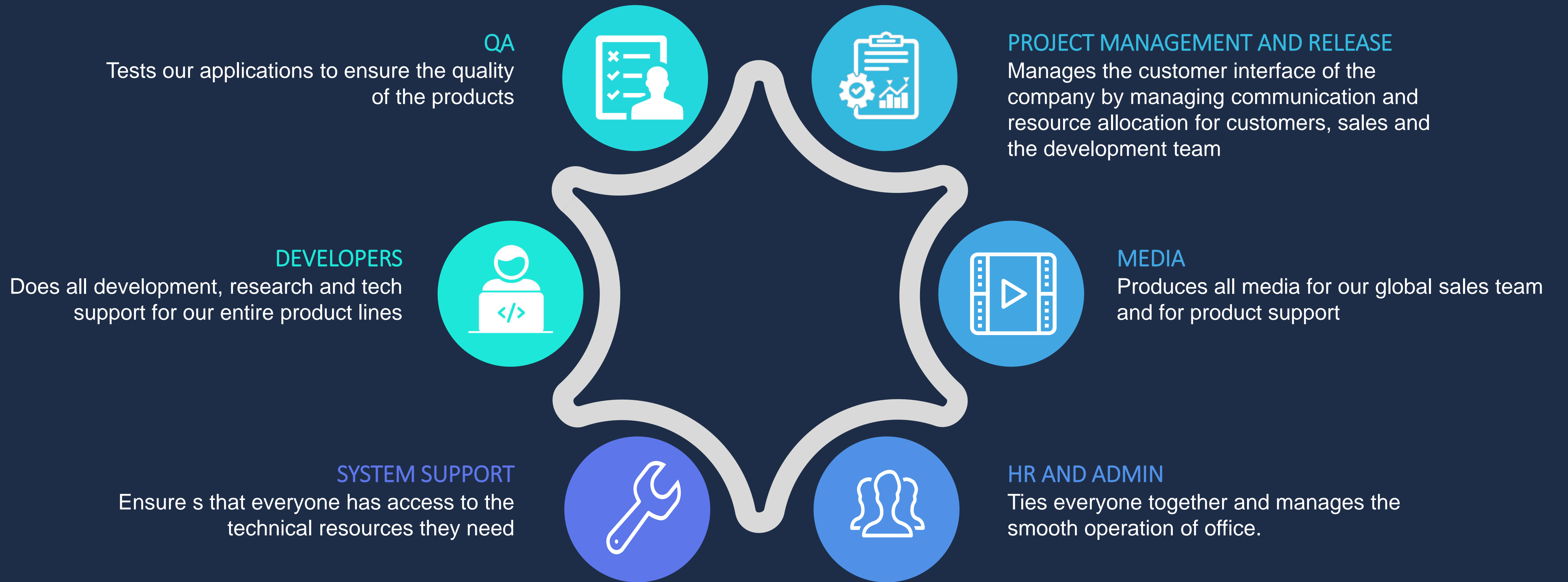


## TEACHING TOOLS

A suite of teacher tools to assist simulation instructors with conducting training or evaluation sessions



# THE LOCAL TEAM









# TENGRI AT A GLANCE



## UNMANNED VEHICLES

We build a platform for building and controlling unmanned vehicles



## GLOBAL

We have a global customer base



## PRODUCTS

We develop only commercial off-the-shelf (COTS) products



## IP

We focus on the development of products which add to our own IP

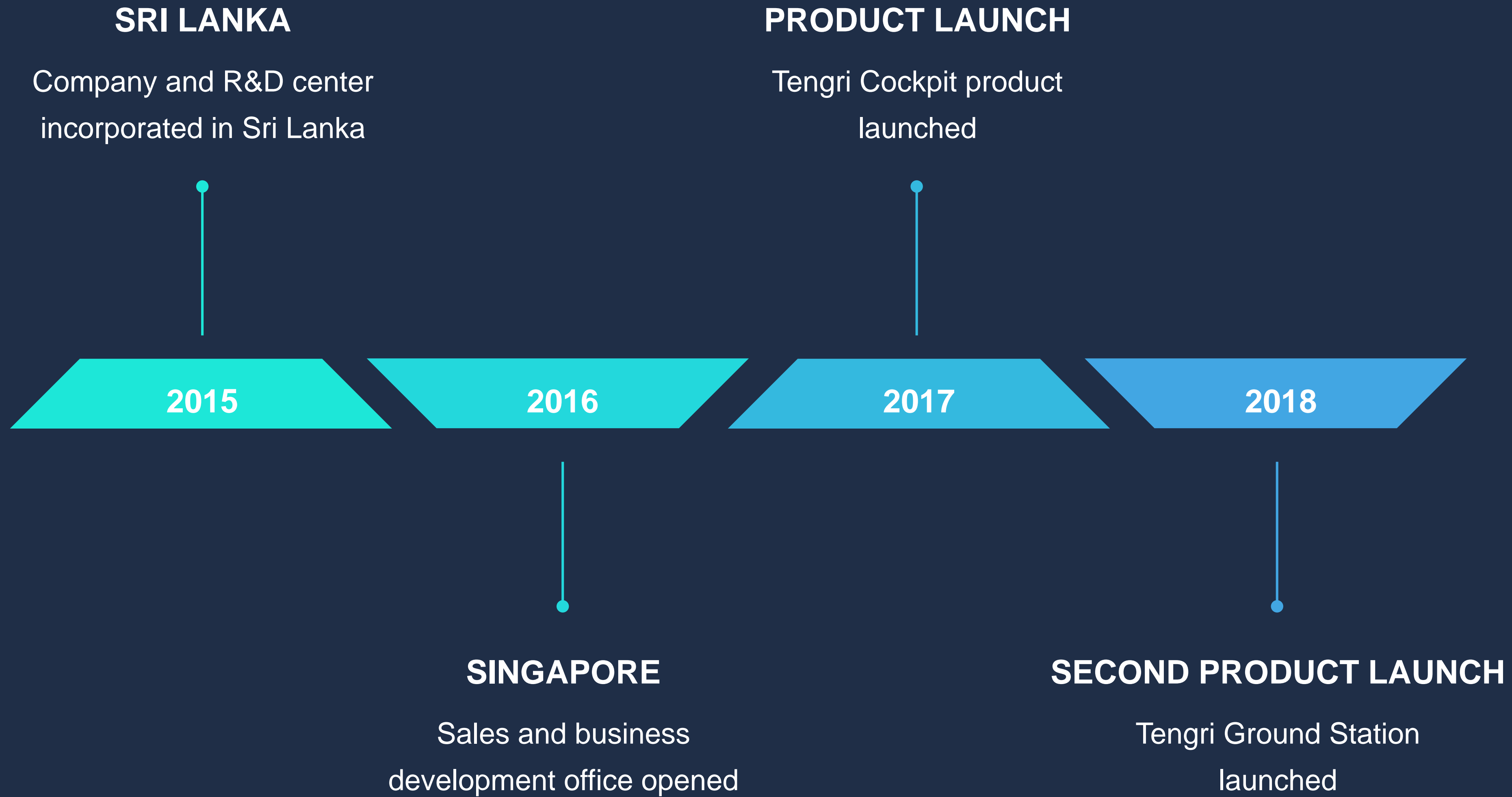


## SRI LANKAN BASE OF OPERATIONS

All research, development, assembly, maintenance and support is done at our Sri Lankan office

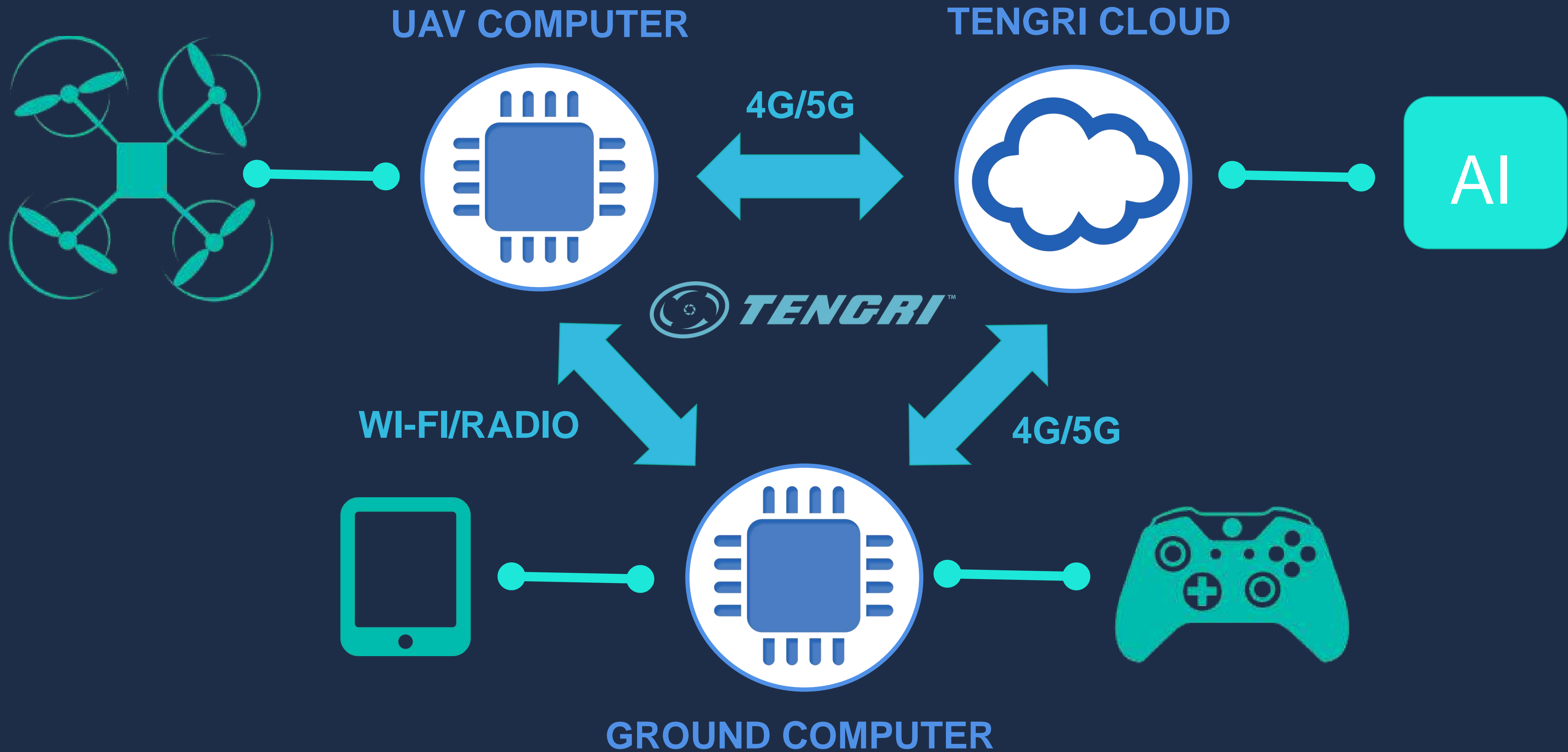


# TENGRI UAV





# **TENGRI™** THE TENGRI UAV PLATFORM







**UAV COMPUTER**  
LAUNCHED IN 2017



**GROUND COMPUTER**  
LAUNCHING NOVEMBER 2018



 **TENGRI™**







**MAPPING**



**SURVEYING**



**INDUSTRIAL  
INSPECTION**



**FIRST  
RESPONDERS**

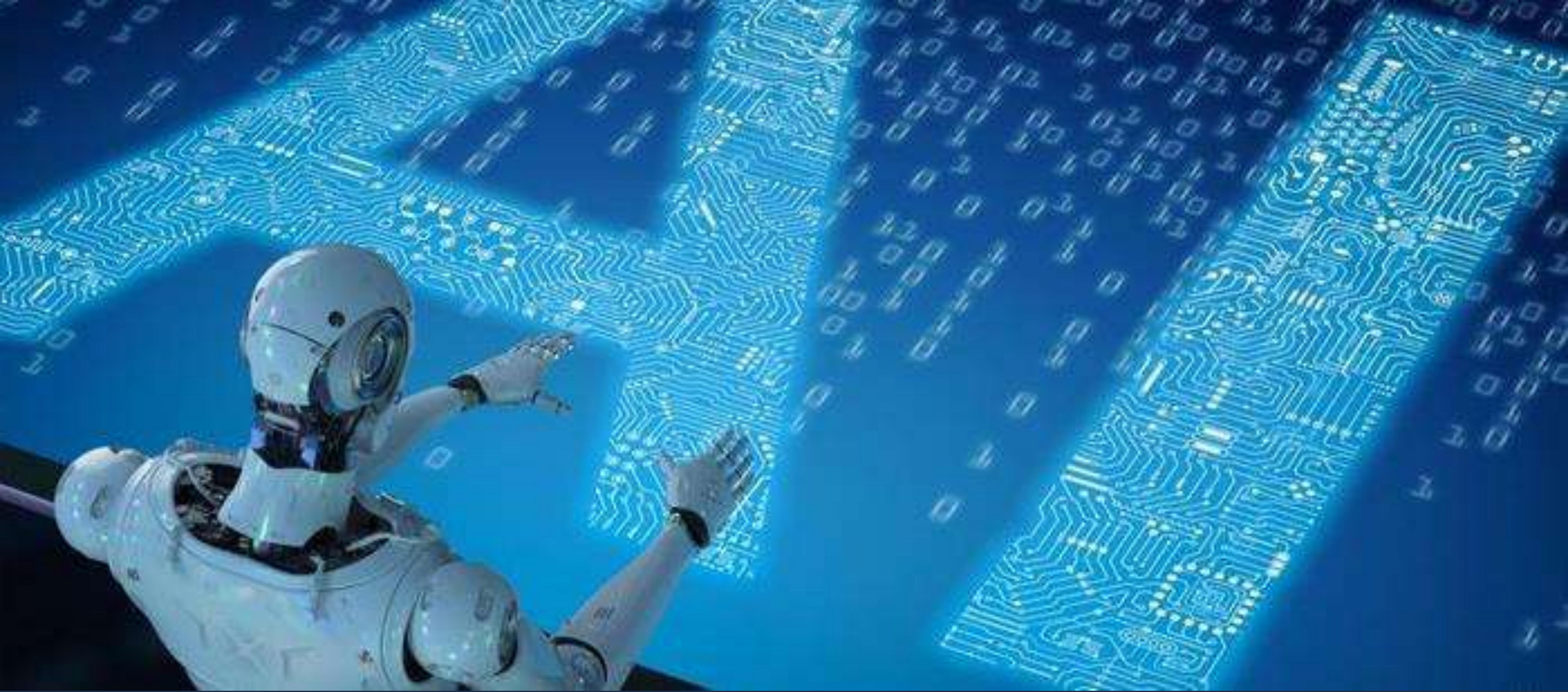


**PRECISION  
AGRICULTURE**



**LAW ENFORCEMENT**





**ARTIFICIAL INTELLIGENCE**



# ACADEMIA

25

**106**

AI Journals

**10%**

of CS publications  
tagged as AI

**361**

AI Conferences

**561**

AI Related Conferences

**20%**

of CS publication tagged  
as AI related

**7125**

AI related organizations

**172**

AI Related Journals

**1/3**

of NSF funding for AI or  
AI related research

“How Big is the Field of Artificial Intelligence”, Luke Muehlhauser & Jonah Sinick, Machine Intelligence Research Institute (MIRI), January 2014

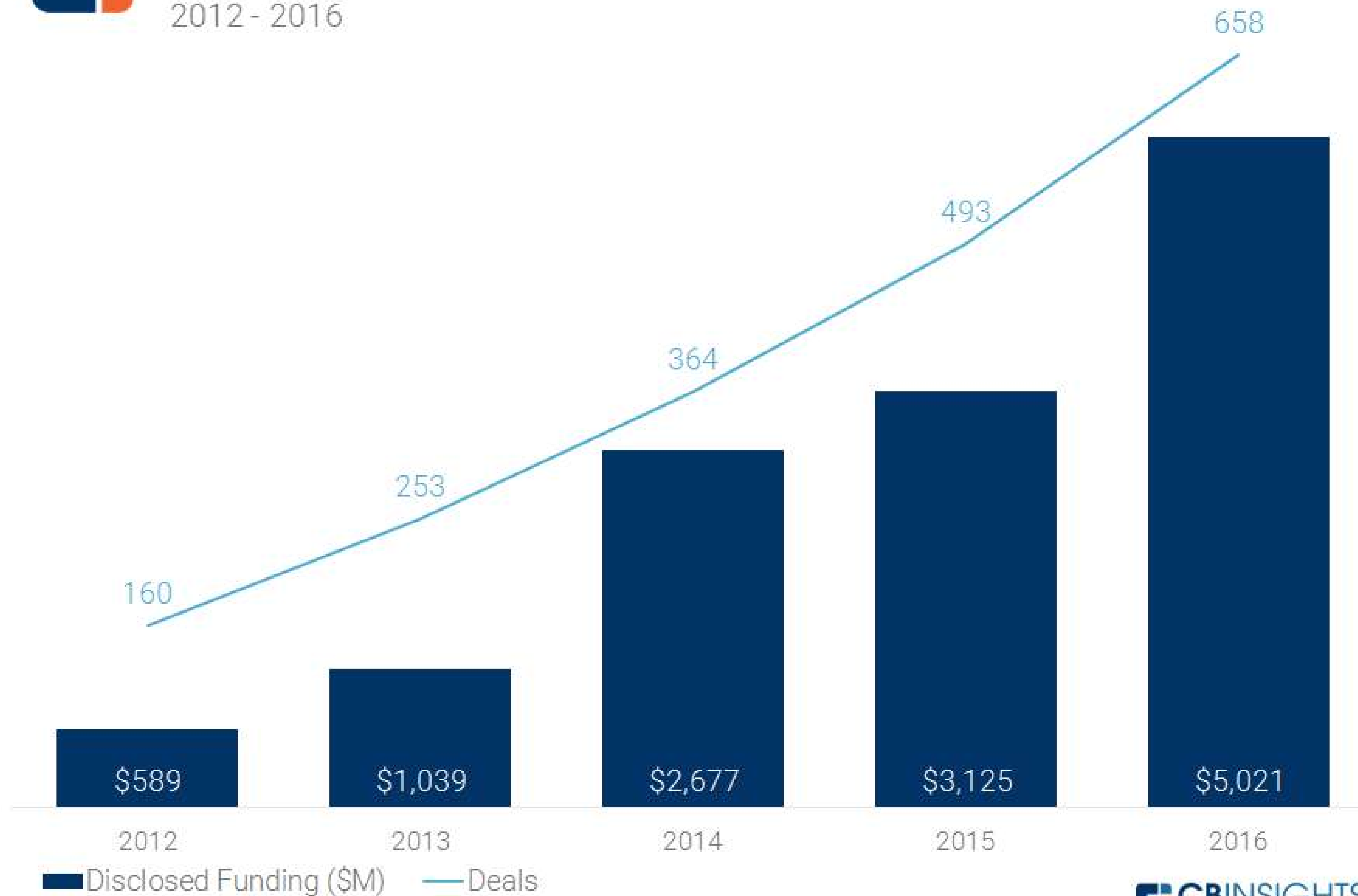


# AI FINANCING



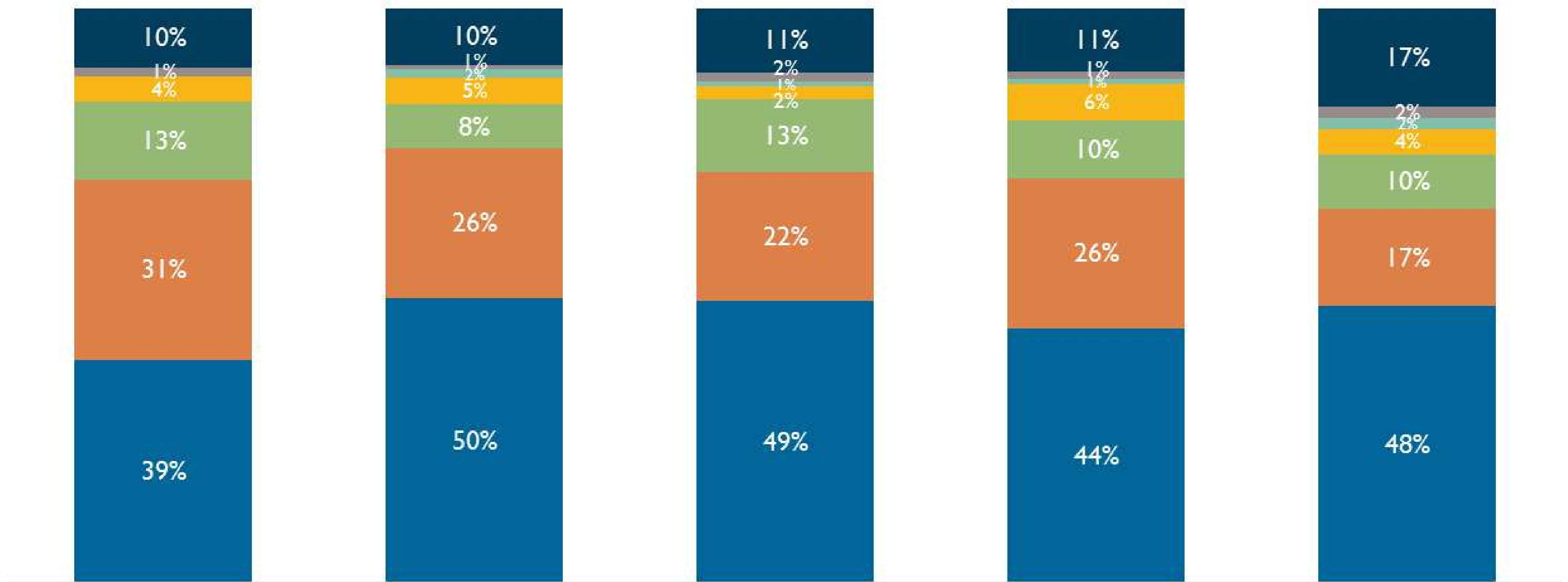
## AI ANNUAL GLOBAL FINANCING HISTORY

2012 - 2016





## Artificial Intelligence: Deal Share By Stage 2011-2015

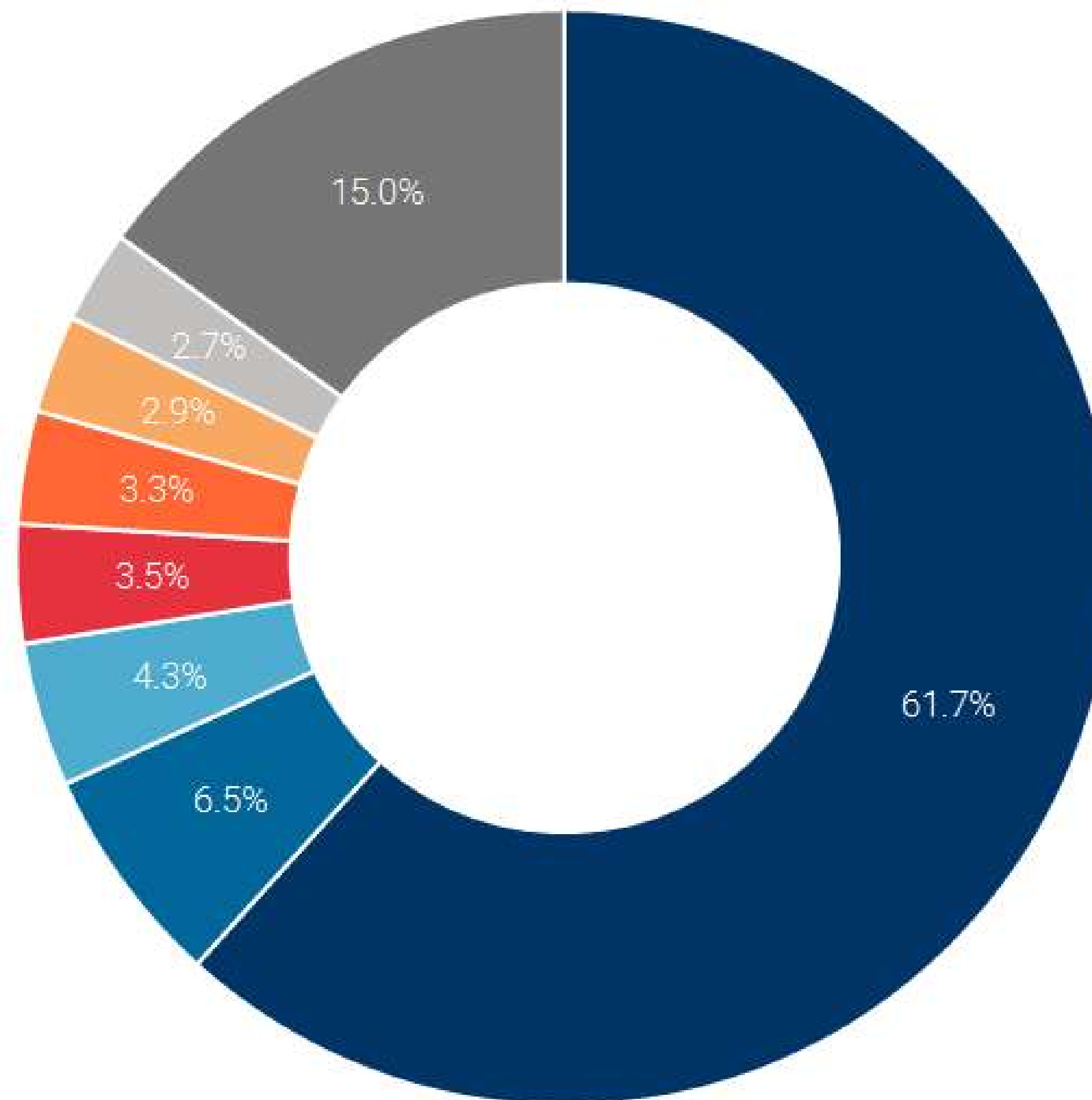




# AI FINANCING

## AI GLOBAL DEAL SHARE 2016

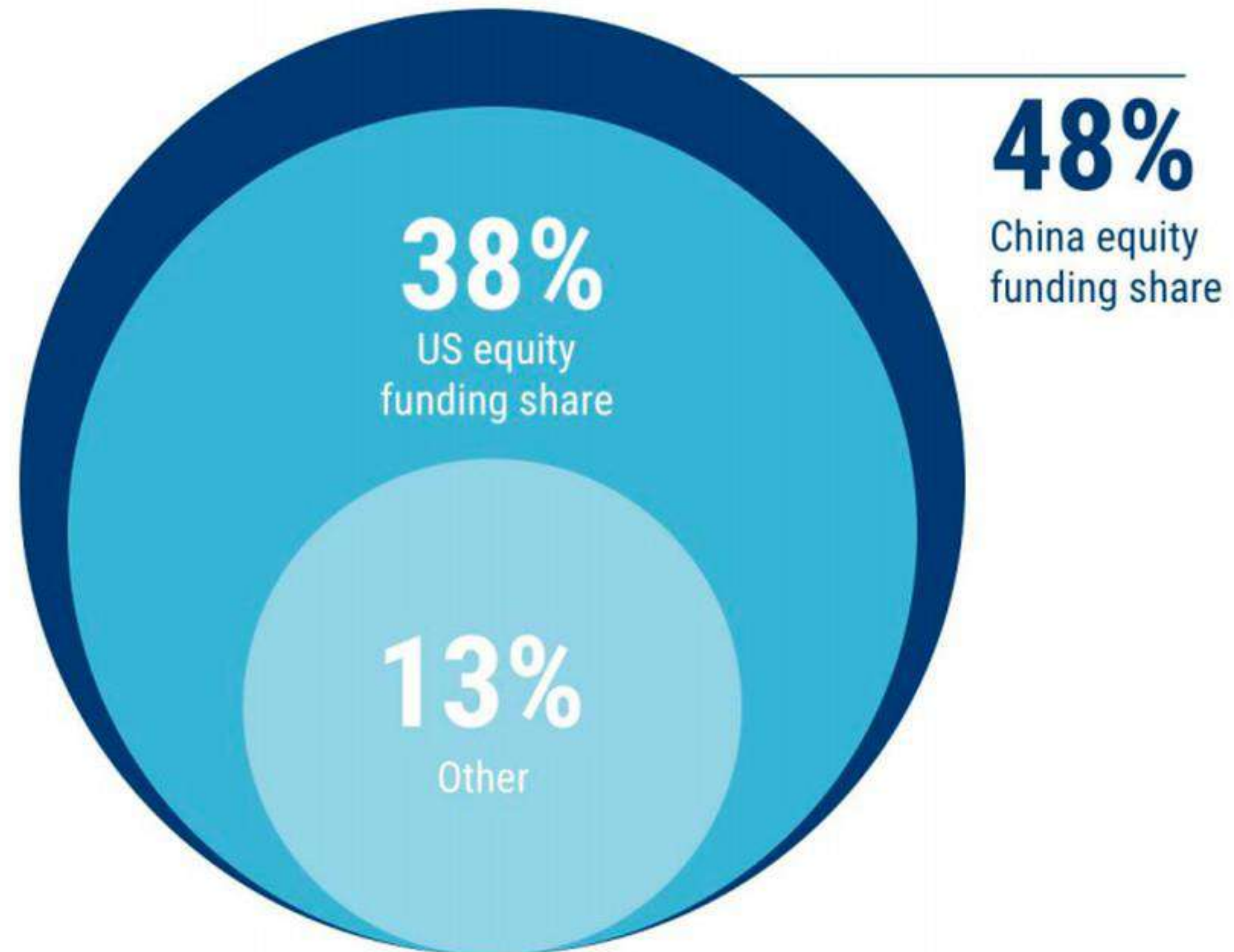
- United States
- United Kingdom
- Israel
- India
- France
- Germany
- Canada
- Other





## China dominates global AI funding

US vs. China total equity funding to startups in 2017























































































# BIG TECH INVESTMENTS

## INVESTMENTS (2012-2017)

## ACQUISITIONS (2012-2017)






	 	   
		         
	    	
		     
	            	 
	                   	            



# BIG TECH INVESTMENTS

## INVESTMENTS (2012-2017)

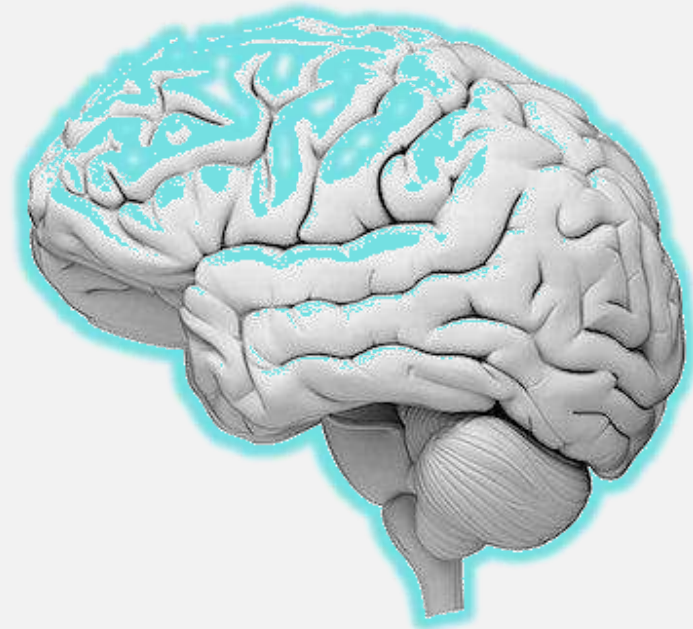
## ACQUISITIONS (2012-2017)

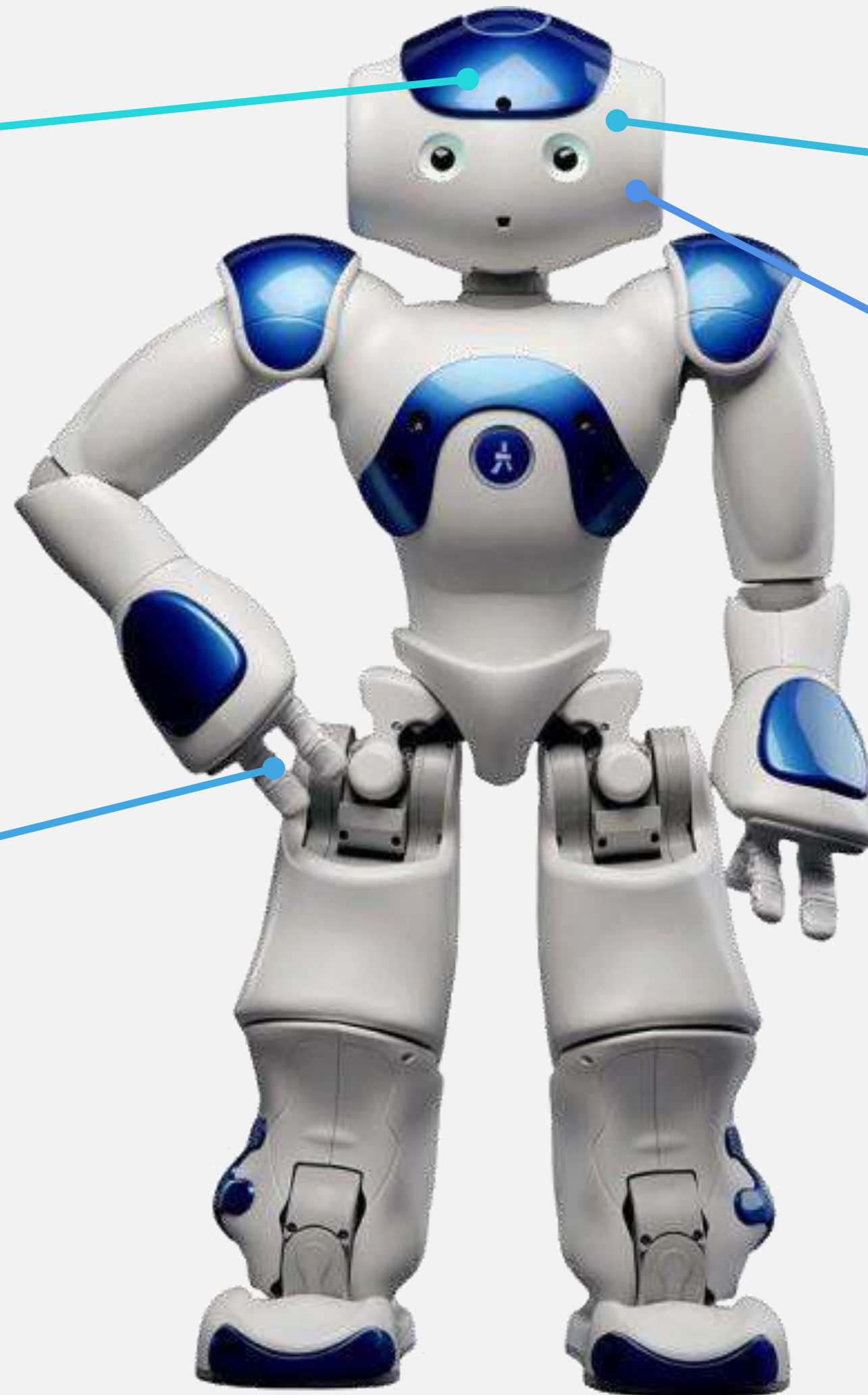


# AUTOMATION

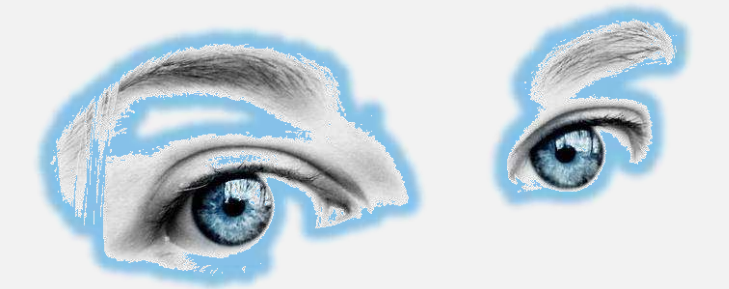
Cognitive reasoning and knowledge representation



Robotic actuator control



Vision and object recognition



Voice recognition and Natural Language Processing



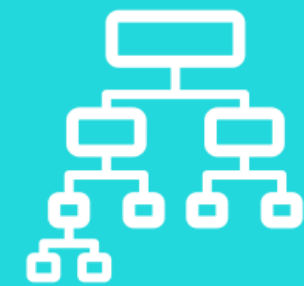
**REPLICATING HUMAN SKILLS**



# AUTOMATION

## MANUAL

Jobs where physical labor is needed to carry out the associated tasks.



## NON-REPITITIVE

Jobs where the tasks carried out over a day vary depending on the task.

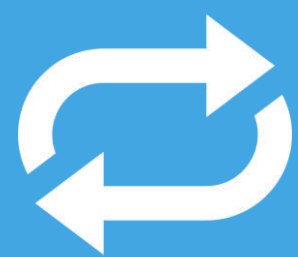
## COGNITIVE

Jobs where knowledge and thought are needed to complete the associated tasks.



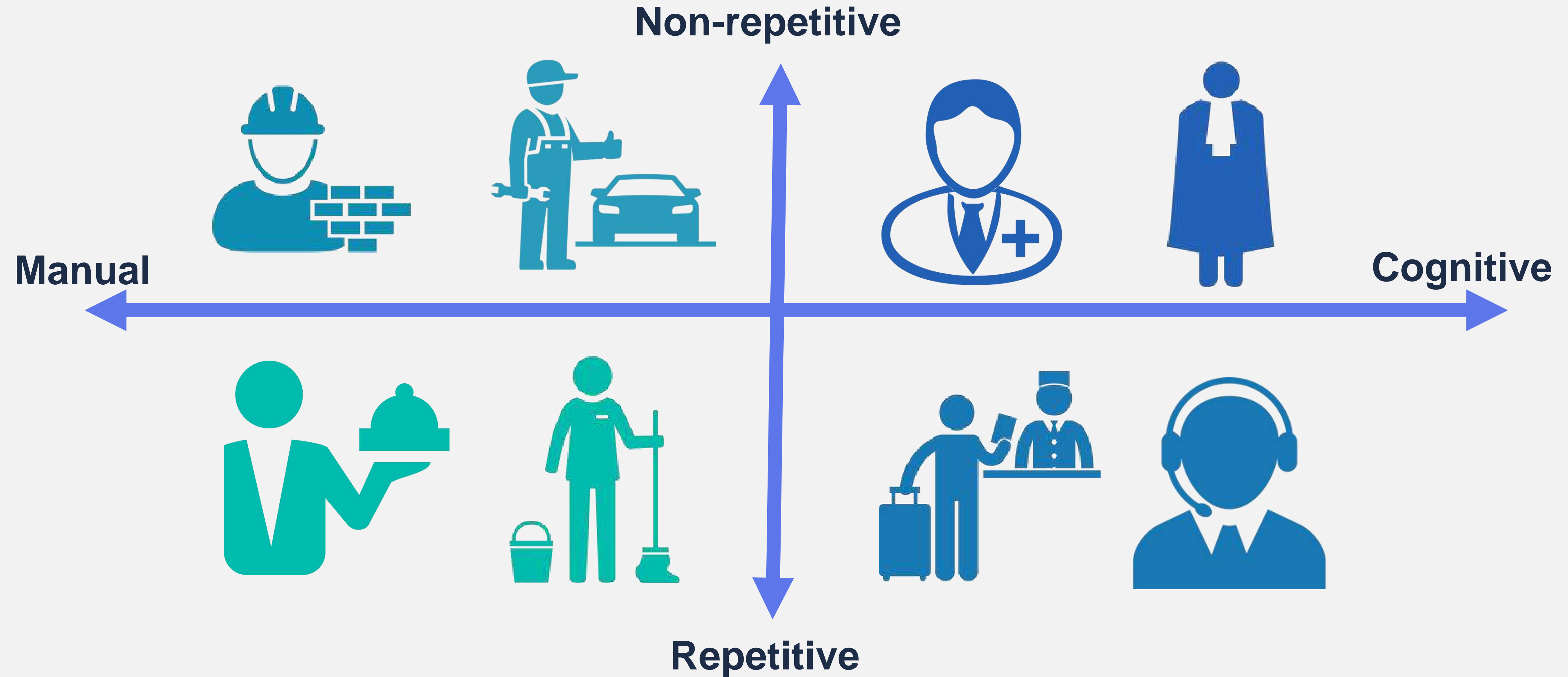
## REPITITIVE

Jobs where the same tasks are repeated over and over again.





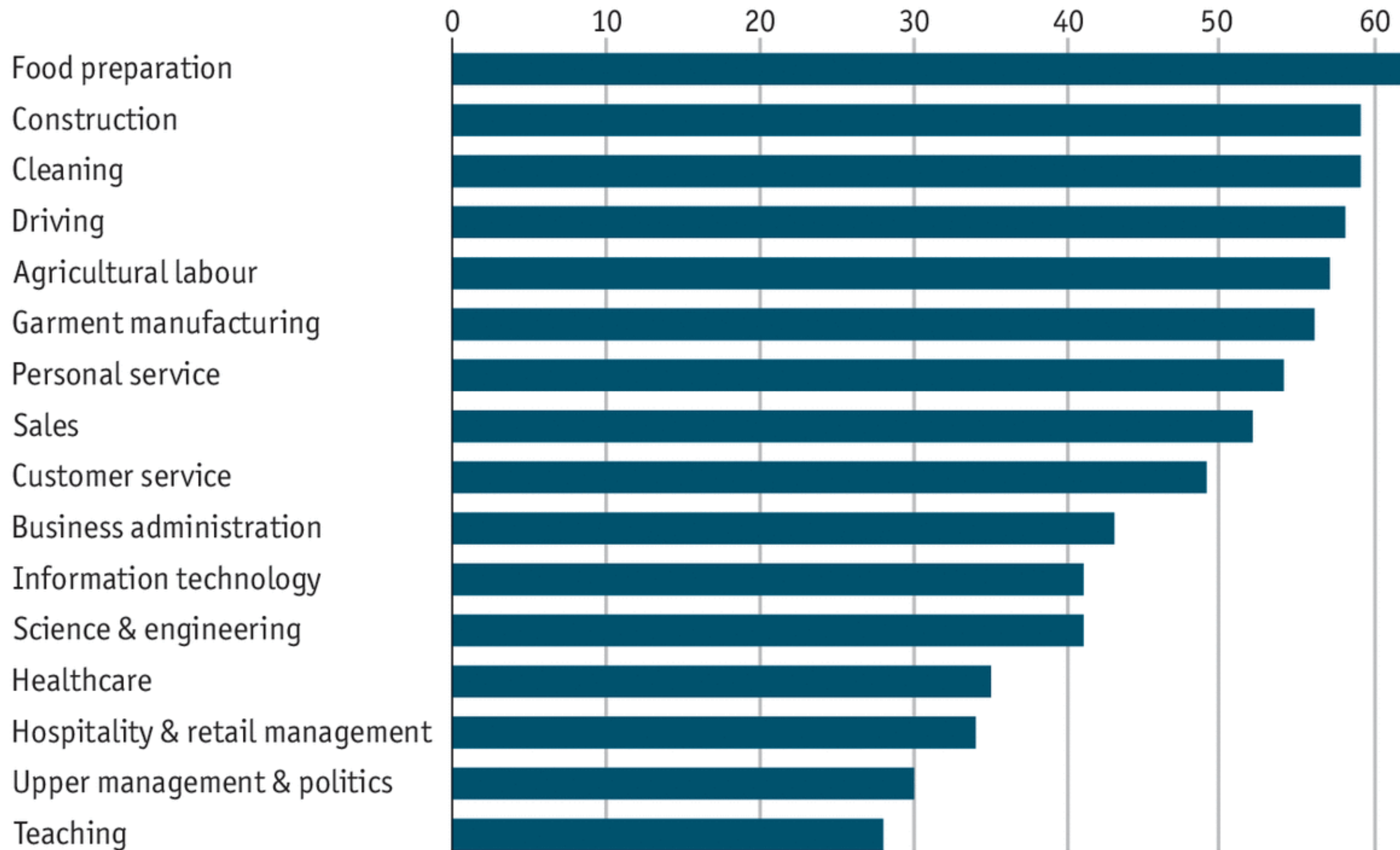
# AUTOMATION





## Automated for the people

Automation risk by job type, %



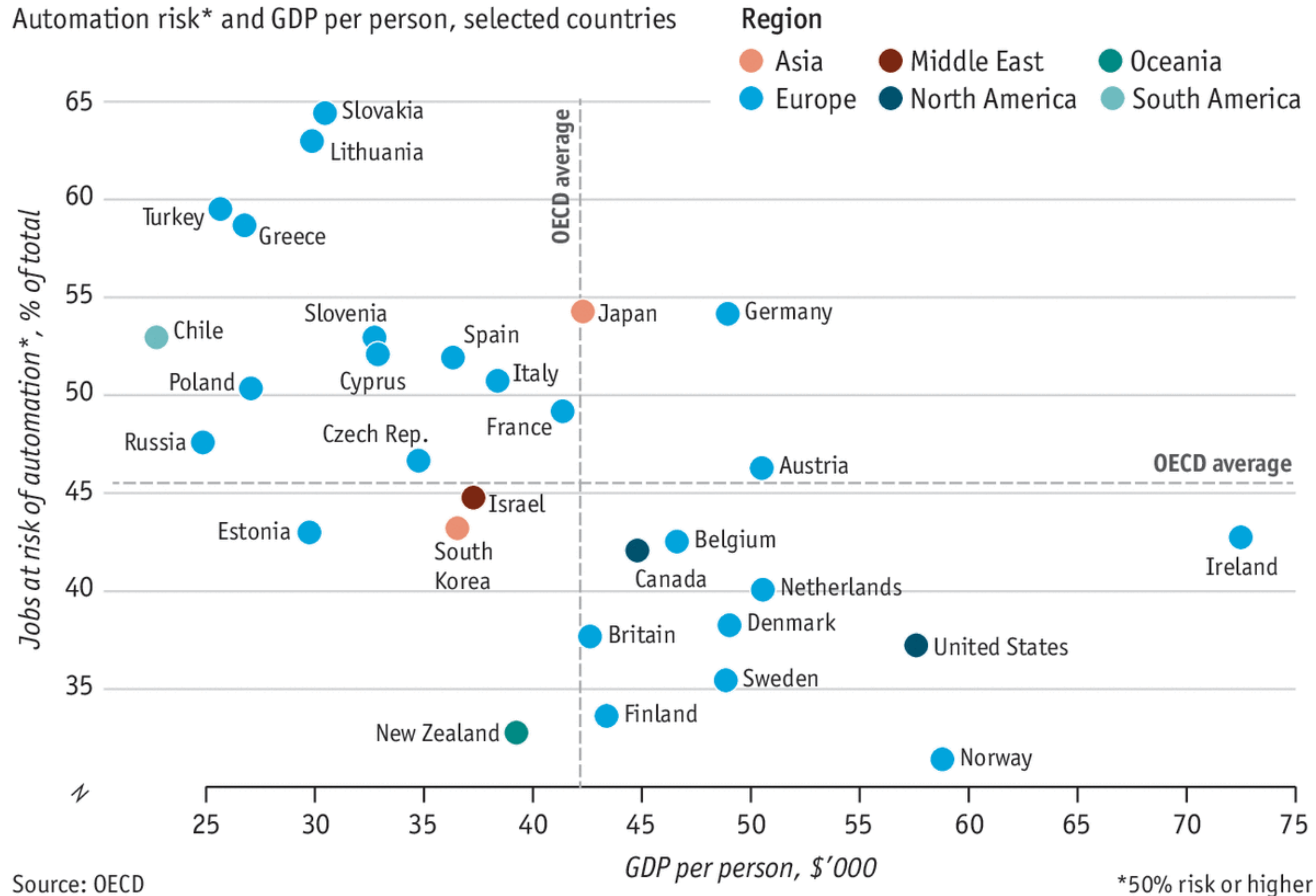
Source: OECD



# AUTOMATION RISK

## Wage against the machine

Automation risk\* and GDP per person, selected countries





# AUTOMATABLE EMPLOYMENT

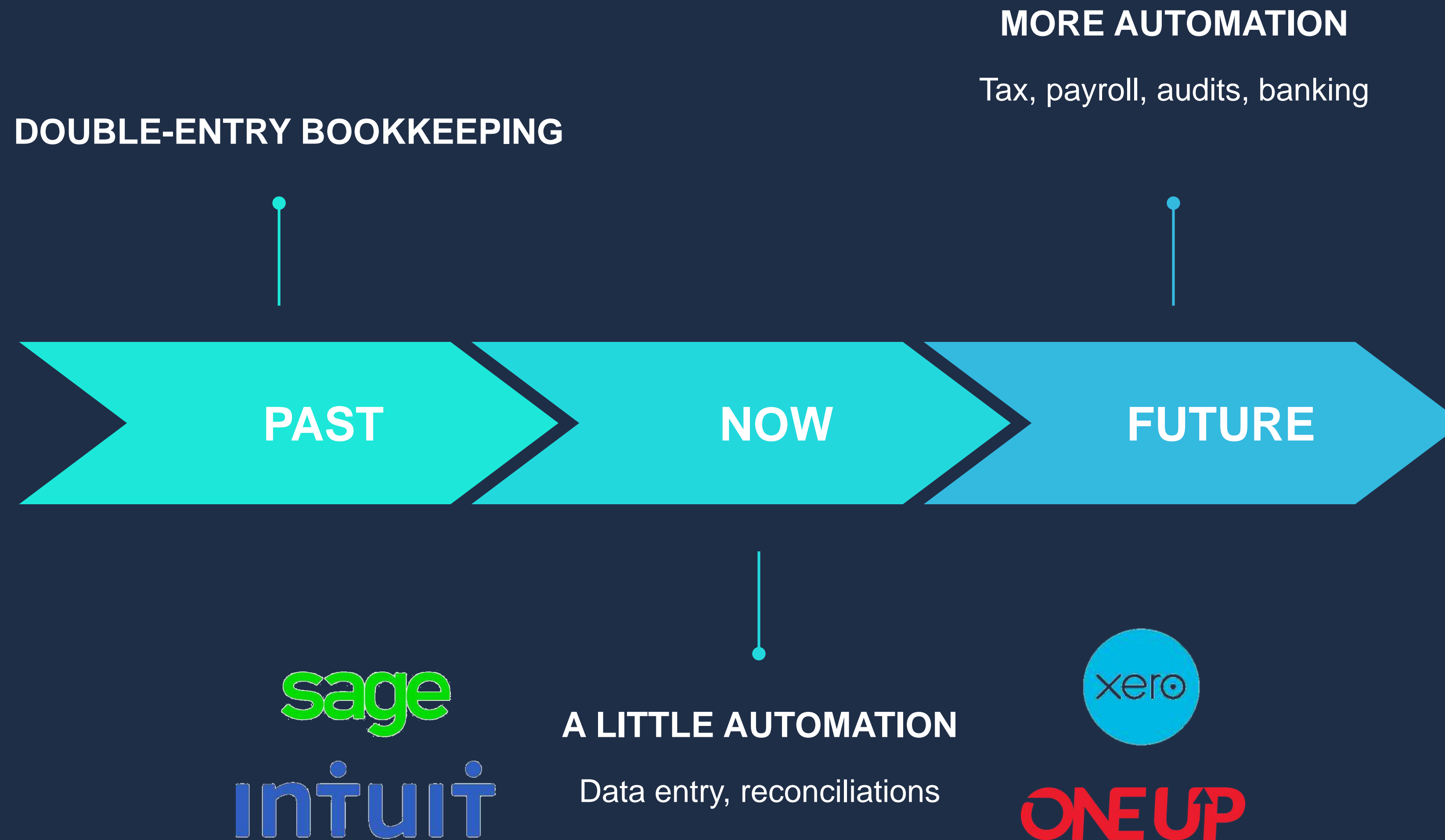
	MGI (2017c)	World Bank (2016)
Argentina	48%	65%
China	51%	77%
Costa Rica	52%	68%
Ethiopia	50%	85%
India	52%	69%
Malaysia	51%	68%
Nigeria	46%	65%
South Africa	41%	67%
Thailand	55%	72%

\* McKinsey Global Institute. (2017c). *Where machines could replace humans — and where they can't (yet)*.

\*\*World Bank. (2016). *World Development Report: Digital dividends*. Washington, DC: World Bank.



# ACCOUNTING – TODAY AND THE FUTURE





## RECENT EXAMPLES

1

### RECONCILIATION OF FEES, PRICING AND TRANSACTION DATA

Data from 200+ financial advisors was reconciled into a single database. Data automatically obtained from pdfs, excel, emails and websites

2

### BROKER DEALER RECONCILIATION

A large broker deal with global operations across 80+ countries were reconciled into a single database. Able to add 2 exchanges a day compared 1 every 2 months.

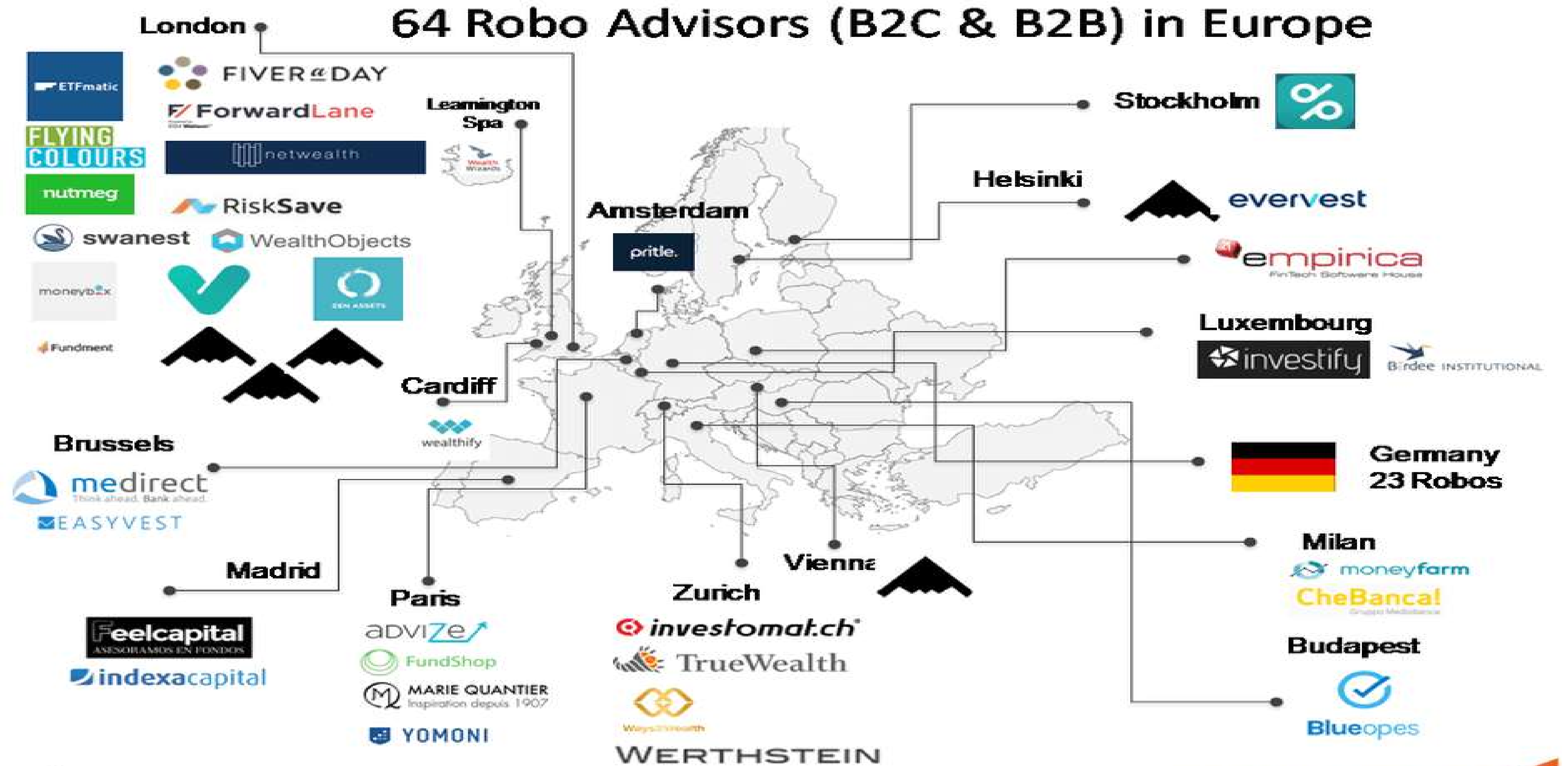
3

### ACQUISITION OF LOAN PORTFOLIO

Data mined from different types of sources and formats. Entire portfolio was analyzed, categorized, matched and entered into database in 2 weeks. (Initial estimate was 1 year).



# ROBO ADVISORS





# INVESTMENT BANKING

## Rebellion Research

- Uses Bayesian networks to predict market trends

## Sentient Technologies

- Highest funded AI tech company in the world (US \$ 168 M)
- Offers a powerful AI platform
- Used within several sectors

## Aidyia

- Uses massive parallel computing to run evolutionary and deep learning algorithms

## Bridgewater Associates

- Worlds largest hedge fund (US \$ 170B)
- Has an internal team of engineers working on a system to automate day-to-day management of the company



Inject randomness

Breed new trading algorithms

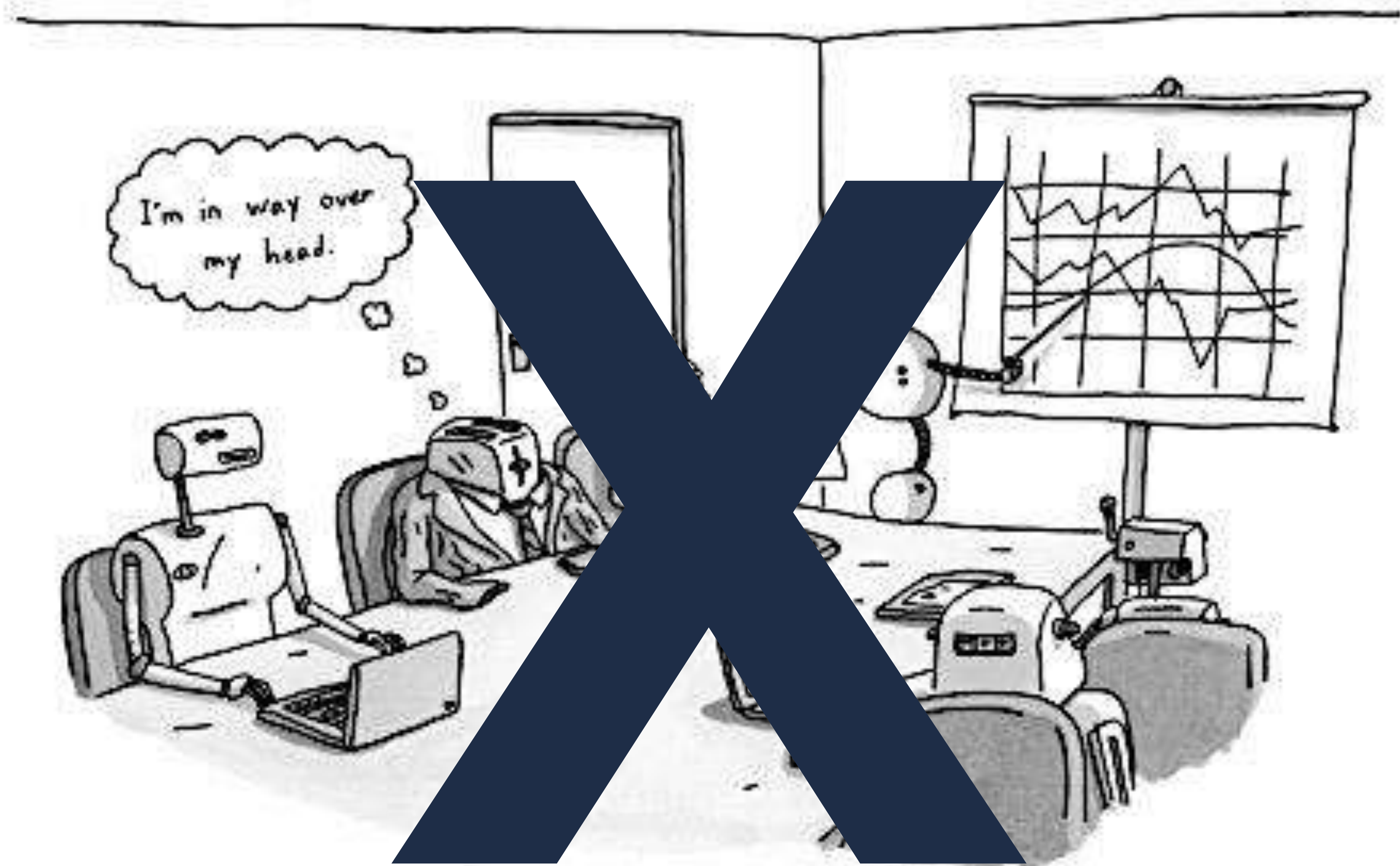


Splice successful algorithms into new ones

Run and analyze each algorithm

- Find best indicators
- Create trading rules
- Convert trading rules into trading strategies







# HOW CAN ACCOUNTANTS ADAPT?

43



## EXPLOIT

Technology is a tool. Learn to exploit it. Understand its capabilities.



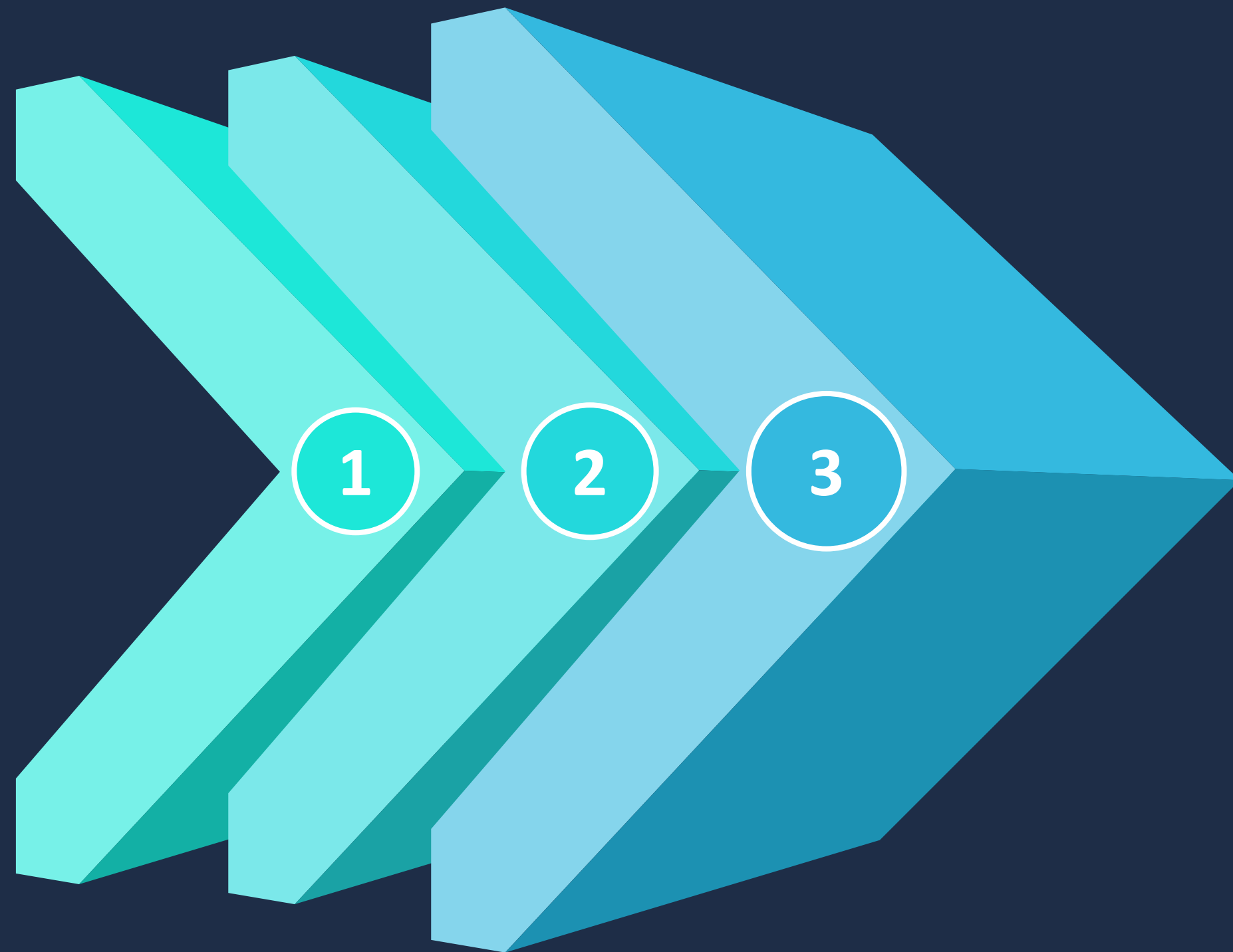
## BE RADICAL

Be open to change and do not be a blocker. Envision step changes instead of incremental changes.



## ADAPT

Learn to adapt quickly. Changes are very hard to predict. Be flexible and be ready to learn new things.



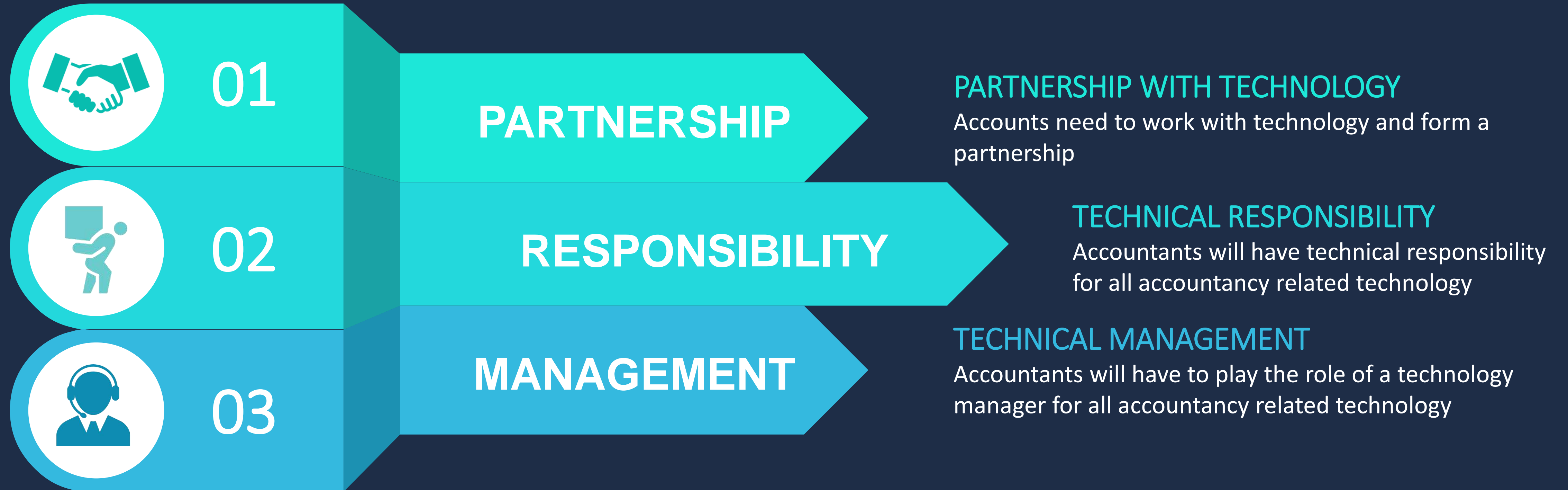


# HUMANS VS TECHNOLOGY?





# ACCOUNTANTS OF THE FUTURE



**Big change to job description and responsibilities**



# ALL MANAGERS WILL BE TECHNOLOGY MANAGERS

## CHOOSE

Senior executives will be responsible for evaluating and choosing the technology which best suits their organization.

## AUDIT

Executives will also be responsible for auditing the technology to make sure that it is working under expected parameters



## INSTALL & MANAGE

Executives will also be responsible for designing and rolling out the deployment platform.

## TEACH

Executives will also be responsible for ensuring that all members of an organization are trained

# RESPONSIBILITIES



# TECHNOLOGY MANAGER SKILLS

## EXPLORE

Spend time to learn about what is going on in the world. Use websites, blogs, podcasts, forums and online videos to keep up-to-date.

## LEARN

Always be willing to spend time to learn something new. Use online resources like courses, videos and forums to deep dive into interesting things.



## TRY

Be open to trying new things and don't be afraid to try something new. Do not be afraid to make mistakes.

## ANSLYSE

Critically self analyze often – both yourself and your organization. Be honest with yourself and understand everything under your control



# WHAT CAN WE DO NOW?

48

1

## START SLOW

Pick easy problems at the start and take it a step at a time. Begin with internal tasks like productivity and client experience improvement.

2

## LEVERAGE EXISTING PLATFORMS

Building AI from scratch is very costly. Use open source platforms and tools so that you can concentrate on the tasks and not the technology.

3

## PICK HIGH ROI PROBLEMS

Define, measure and decide. Make sure to define expectations. Important to also know what AI cannot do.

4

## AUTOMATE ML PROCESS

Automate the machine learning process in your company so that your models improve continuously. Move away from manual data preparation as soon as possible. Use coders as little as possible on the long run.



# DIGITAL TRANSFORMATION IDEAS

49



## EXPENSE SUBMISSIONS

AI can learn company expense policy, read receipts and audit claims



## INVOICE PAYMENTS

Analyze invoices and match amount paid to the right combination of invoices



## RISK ASSESSMENT

Comparison of proposed projects with historical projects



## ANALYTICS

Quick, real-time analytics



## VOICE COMMUNICATION

Create invoices and answer questions using voice communication



## INVOICE CATEGORISATION

Learn how to categorize invoices



## BANK RECONCILIATION

Completely reconcile bank accounts



CA



THE INSTITUTE OF  
CHARTERED ACCOUNTANTS OF SRI LANKA

HYPERLEAP  
The National Centre for  
Chartered Accountants



01

PARTNERSHIP



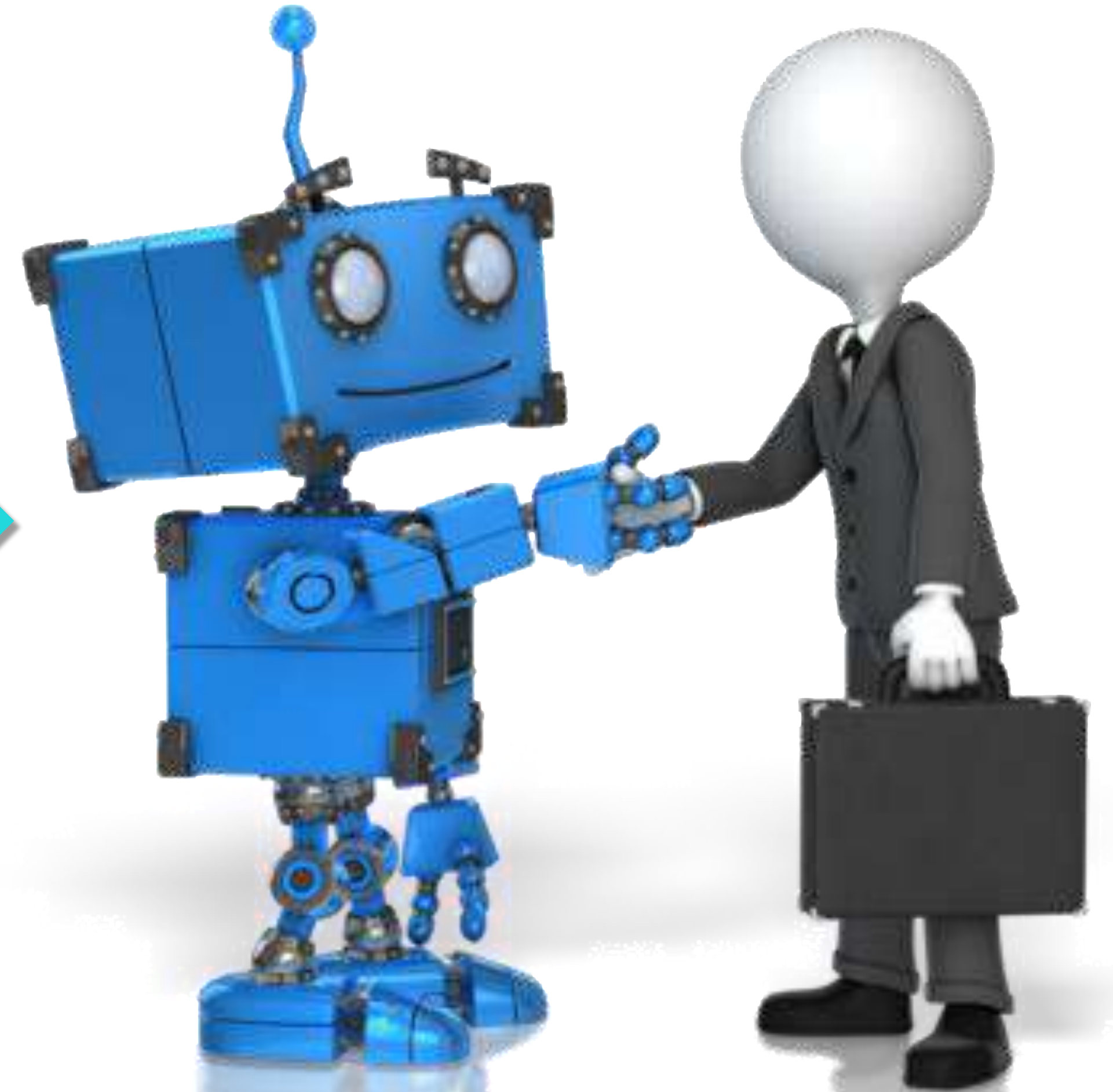
02

RESPONSIBILITY



03

MANAGEMENT



**THANK YOU!**