

The background features a dark blue and purple gradient with glowing blue circuit lines and dots. On the left, the letters 'AI' are displayed in a large, white, sans-serif font, enclosed within a white rectangular frame that resembles a microchip. To the right of the 'AI' frame, the word 'KEY' is written in a blue, sans-serif font with a white underline. Below 'KEY', the word 'CHALLENGES' is written in a large, blue, sans-serif font with a white underline. At the bottom, a purple rectangular box contains the event details in white text.

AI

KEY

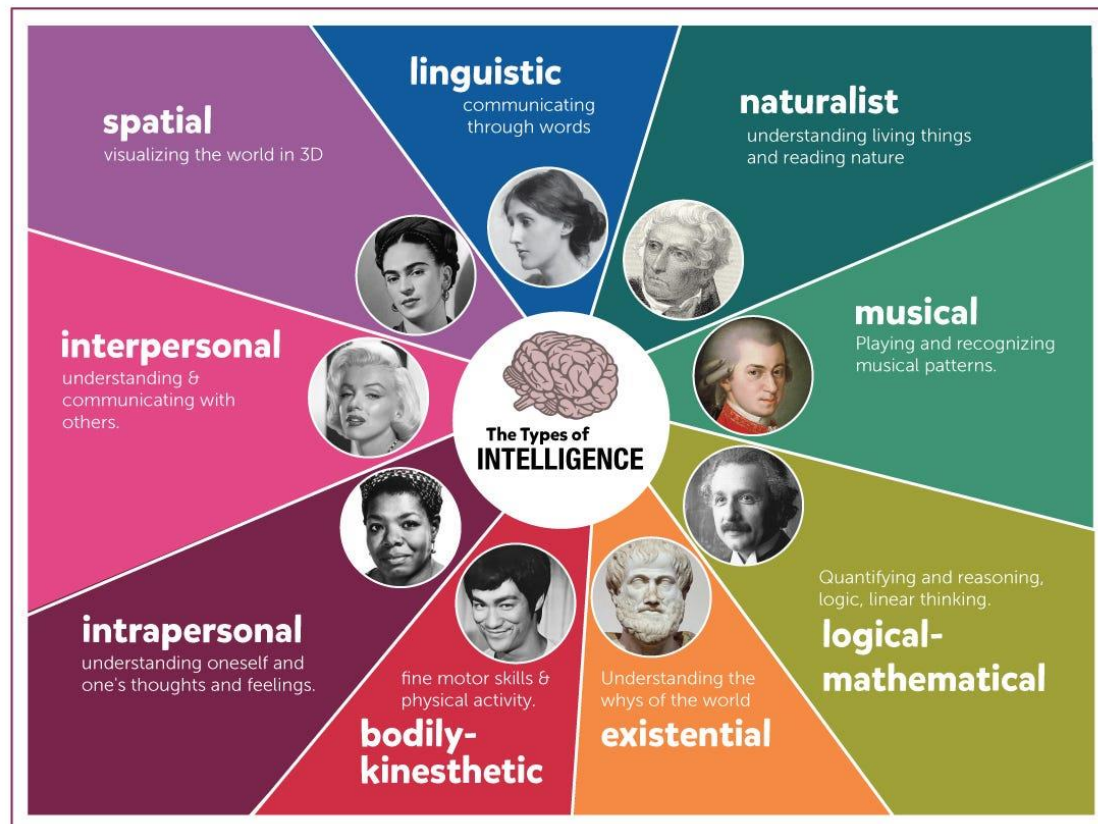
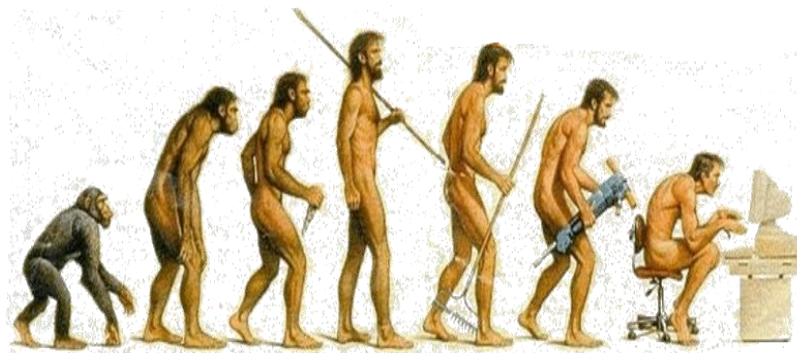
CHALLENGES

AI SUMMIT 2023

20 July 2023

Col Surender Kumar Rohilla

# HUMAN EVOLUTION



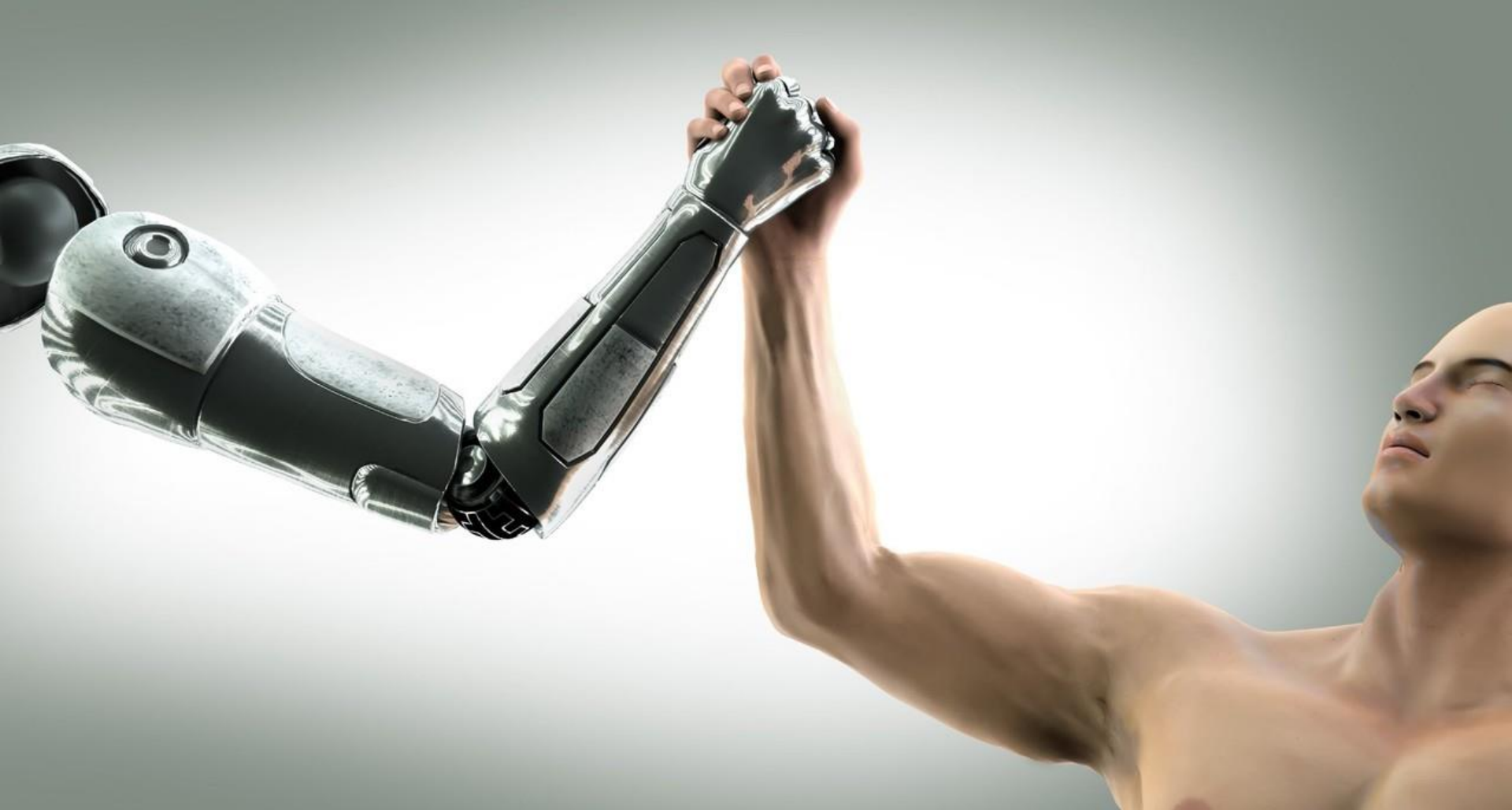
# EVOLUTION OF SMART MACHINE



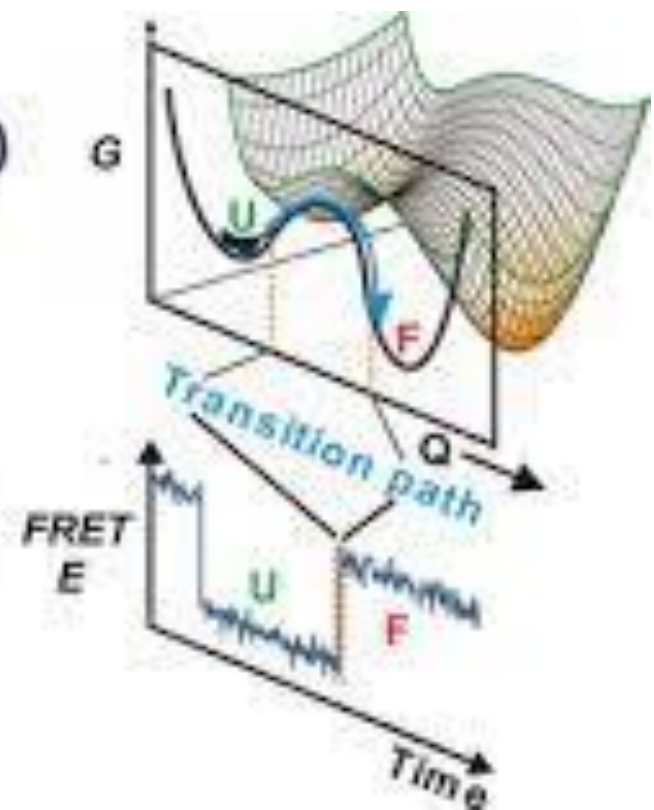
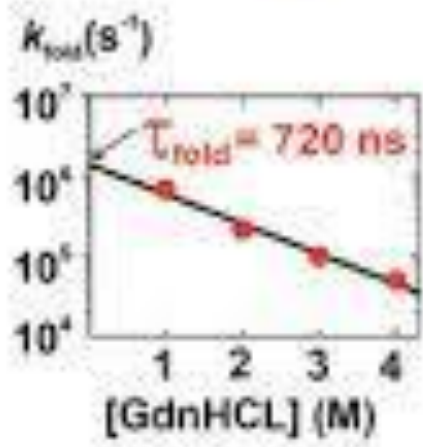
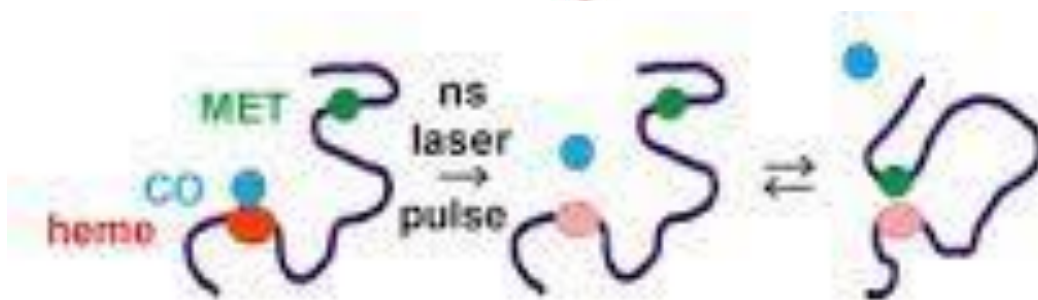


# INTELLIGENCE IN MACHINES

# THE MAN VS THE MACHINE



# BETTER THAN HUMANS



The image features a dark blue background with a complex network of glowing blue lines and dots, resembling a circuit board or data flow. On the left, a white-outlined square contains the letters 'AI' in a large, white, sans-serif font. To the right of this square, the word 'USAGE' is written in a large, blue, 3D-style sans-serif font, underlined with a white horizontal line. The overall aesthetic is futuristic and technological.

AI

USAGE

# Artificial Intelligence Usage



Transportation



Banking



Customer service



Manufacturing



Criminal justice



Human resources



Government sector



Ecommerce



Social media



Civil security



Data analytics



Robotics



Entertainment



Food tech



Sports



Retail



Media



Education



Logistics



Business operations



Healthcare



Cyber security



Agriculture



Marketing



Communication



Insurance



Tourism



Military

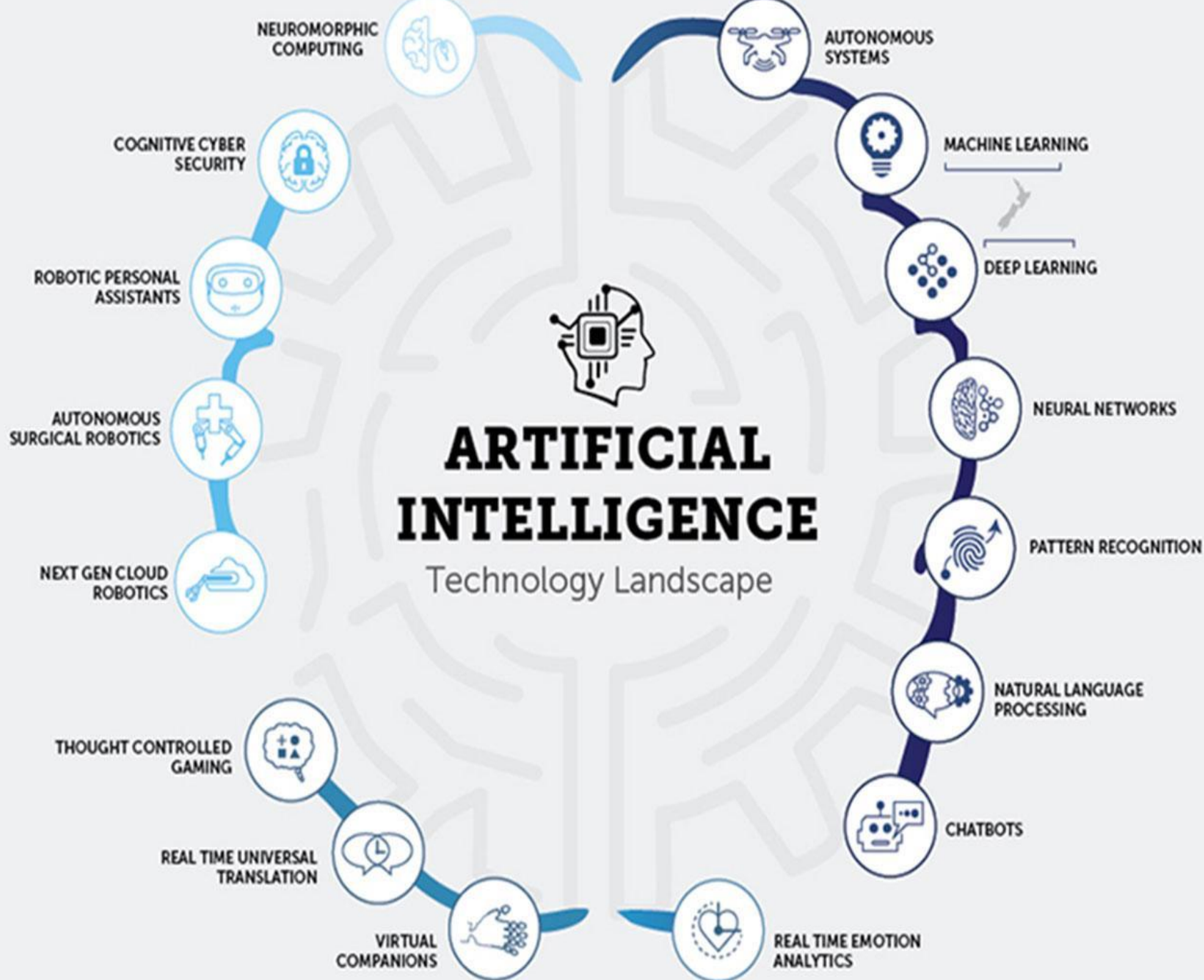


Real estate



Smart homes





A stylized graphic of a square microchip with a glowing purple and blue gradient. The letters 'AI' are prominently displayed in the center in a white, sans-serif font. The chip has a series of vertical lines along its top and bottom edges, and a dotted line along its left edge.

AI

**DEFINATION**

---

SEC. 4701. DEPARTMENT OF ENERGY NATIONAL SECURITY PROGRAMS  
(In Thousands of Dollars)

Program	FY 2021 Request	Conference Authorized
Prior year balances credited .....	-109,000	-109,000
<b>Total, Defense Environmental Cleanup .....</b>	<b>4,983,608</b>	<b>5,815,767</b>
<b>Other Defense Activities</b>		
<b>Environment, health, safety and security</b>		
Environment, health, safety and security .....	134,320	134,320
Program direction .....	75,368	75,368
<b>Total, Environment, Health, safety and security .....</b>	<b>209,688</b>	<b>209,688</b>
<b>Independent enterprise assessments</b>		
Independent enterprise assessments .....	26,949	26,949
Program direction .....	54,635	54,635
<b>Total, Independent enterprise assessments .....</b>	<b>81,584</b>	<b>81,584</b>
Specialized security activities .....	258,411	258,411
<b>Office of Legacy Management</b>		
Legacy management .....	293,873	140,194
Rejection of proposed transfer .....		[-153,679]
Program direction .....	23,120	23,120
<b>Total, Office of Legacy Management .....</b>	<b>316,993</b>	<b>163,314</b>
Defense related administrative support .....	183,789	183,789
Office of hearings and appeals .....	4,262	4,262
<b>Subtotal, Other defense activities .....</b>	<b>1,054,727</b>	<b>901,048</b>
<b>Total, Other Defense Activities .....</b>	<b>1,054,727</b>	<b>901,048</b>

**DIVISION E—NATIONAL ARTIFICIAL INTELLIGENCE  
INITIATIVE ACT OF 2020**

**SEC. 5001. SHORT TITLE.**

This division may be cited as the “National Artificial Intelligence Initiative Act of 2020”.

**SEC. 5002. DEFINITIONS.**

In this division:

(1) **ADVISORY COMMITTEE.**—The term “Advisory Committee” means the National Artificial Intelligence Advisory Committee established under section 5104(a).

(2) **AGENCY HEAD.**—The term “agency head” means the head of any Executive agency (as defined in section 105 of title 5, United States Code).

(3) **ARTIFICIAL INTELLIGENCE.**—The term “artificial intelligence” means a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments. Artificial intelligence systems use machine and human-based inputs to—

(A) perceive real and virtual environments;

(B) abstract such perceptions into models through analysis in an automated manner; and

(C) use model inference to formulate options for information or action.

(4) **COMMUNITY COLLEGE.**—The term “community college”

The United States defined the term “AI” in the [National Artificial Intelligence Act of 2020 section 5002\(3\)](#) as:

“A machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions influencing real or virtual environments.

Artificial intelligence systems use machine and human-based inputs to:

- Perceive real and virtual environments;
- Abstract such perceptions into models through analysis in an automated manner; and
- Use model inference to formulate options for information or action”

A stylized graphic of a square microchip with a glowing purple and blue gradient. The letters 'AI' are prominently displayed in the center in a white, sans-serif font. The chip has a series of vertical lines along its top and bottom edges, and a vertical line of dots along its right edge.

AI

TYPES

# Three types of Artificial Intelligence

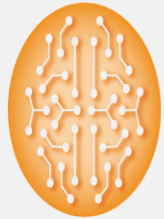


Artificial Narrow  
Intelligence (ANI)

Stage-1

Machine  
Learning

Specialises in  
one area and  
solves one problem



Artificial General  
Intelligence (AGI)

Stage-2

Machine  
Intelligence

Refers to a computer that  
is as smart as a human  
across the board

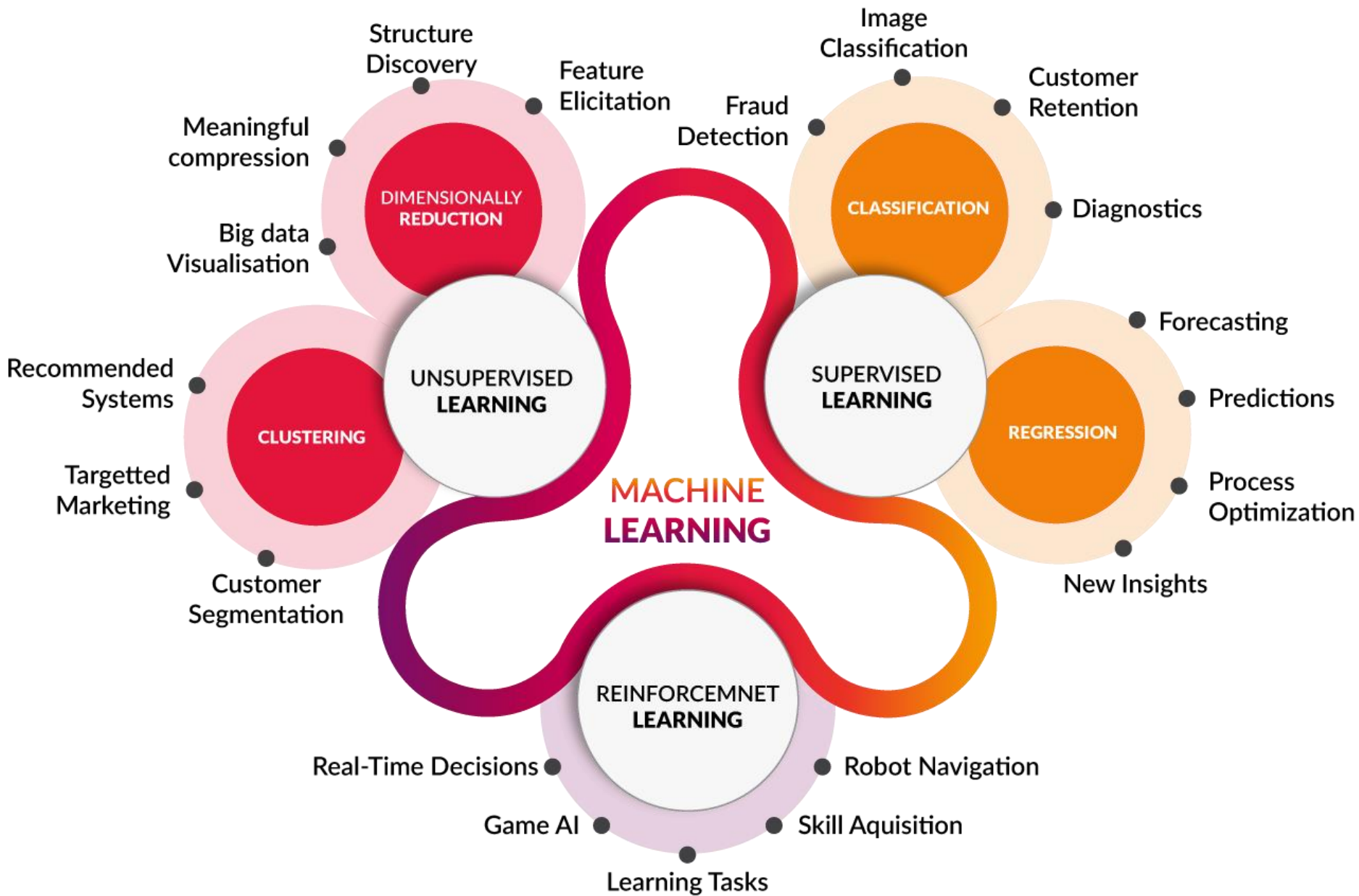


Artificial Super  
Intelligence (ASI)

Stage-3

Machine  
Consciousness

An intellect that is much  
smarter than the best human  
brains in practically every field



# A brief history of... Artificial Intelligence.

CREATED BY  
 genuine  
impact

## The Turing Test

Where a human evaluator engages in natural language conversation with a machine and a human

**1943**

McCullock & Pitts publish a paper titled 'A Logical Calculus of Ideas Immanent in Nervous Activity', proposing the groundwork for neural networks.



**1950**

Turing publishes 'Computing Machinery and Intelligence', proposing the Turing Test as a way to measure a machine's ability.



**1951**

Marvin Minsky and Dean Edmonds build SNARC, the first neural network computer.



**1956**

The Dartmouth Conference (organised by McCarthy, Minsky, Rochester, and Shannon) is held, marking the birth of AI as a field of study.



**1957**

Rosenblatt develops the Perceptron: the first artificial neural network capable of learning.



**1974**

The first AI winter begins, marked by a decline in funding and interest in AI research due to unrealistic expectations and limited progress.



**1967**

Newell and Simon develop the General Problem Solver (GPS), one of the first AI programs to demonstrate human-like problem-solving.



**ELIZA**

**1965**

Weizenbaum develops ELIZA: a natural language processing program that simulates conversation.

**1980**

Expert systems gain popularity, with companies using them for financial forecasting and medical diagnoses.



## Neural Networks

Machine learning models that mimic the brain, learning to recognize patterns and make predictions via artificial neuron connections



**1986**

Hinton, Rumelhart, and Williams publish 'Learning Representations by Back-Propagating Errors', allowing much deeper neural networks to be trained.



**1997**

IBM's Deep Blue defeats chess world champion Kasparov, marking the first time a computer beats a world champion in a complex game.



## Natural Language Processing

Teaches computers to understand and use human language using techniques like machine learning



## DeepMind

Was acquired by Google in 2014 for \$500 million



**2014**

Facebook creates DeepFace, a facial recognition system that can recognise faces with near-human accuracy.



**2012**

AI startup DeepMind develops a deep neural network that can recognize cats in YouTube videos.



**2011**

IBM's Watson defeats two former Jeopardy! champions.



**2002**

iRobot introduces Roomba, the first mass-produced domestic robot vacuum cleaner with an AI-powered navigation system.



**2015**

AlphaGo, developed by DeepMind, defeats world champion Lee Sedol in the game of Go.



**2020**

OpenAI releases GPT-3, marking a significant breakthrough in natural language processing.



**2021**

DeepMind's AlphaFold2 solves the protein-folding problem, paving the way for new drug discoveries and medical breakthroughs.



**2022**

Google fires engineer Blake Lemoine over his claims that Google's Language Model for Dialogue Applications (LaMDA) was sentient.



**2023**

Artists file a class-action lawsuit against Stability AI, DeviantArt, and Midjourney for their use of Stable Diffusion to remix the copyrighted works of millions of artists



**2017**

Google's AlphaZero defeats the world's best chess and shogi engines in a series of matches.



A graphic of a square microchip with a white border and small square notches at the corners. Inside the chip, the letters 'AI' are written in a large, white, sans-serif font. The background of the chip is a gradient from purple to blue. Above and below the chip are horizontal rows of small white vertical bars, resembling a barcode or data interface.

AI

GENERATIVE

AI



# THE NEW INDUSTRY REVOLUTION WITH LARGE LANGUAGE MODELS



# ChatGPT: Optimizing Language Models for Dialogue

We've trained a model called ChatGPT which interacts in a conversational way. The dialogue format makes it possible for ChatGPT to answer followup questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests. ChatGPT is a sibling model to InstructGPT, which is trained to follow an instruction in a prompt and provide a



A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a vertical line of pins on its left edge. The background is a dark blue with glowing circuit lines and nodes.

AI

KEY

CHALLENGES

A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on the top and bottom edges and a dotted line on the left side. The background is a dark blue circuit board pattern with glowing blue lines and dots.

AI

KEY  
CHALLENGES

DATA QUALITY AND AVAILABILITY

# What is GIGO?



# DATA COLLECTION TECHNIQUES



**Observations**



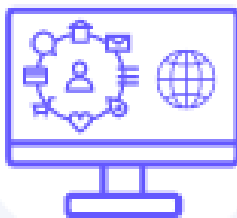
**Interviews and  
Focus Groups**



**Transactional  
Tracking**



**Social Media  
Monitoring**



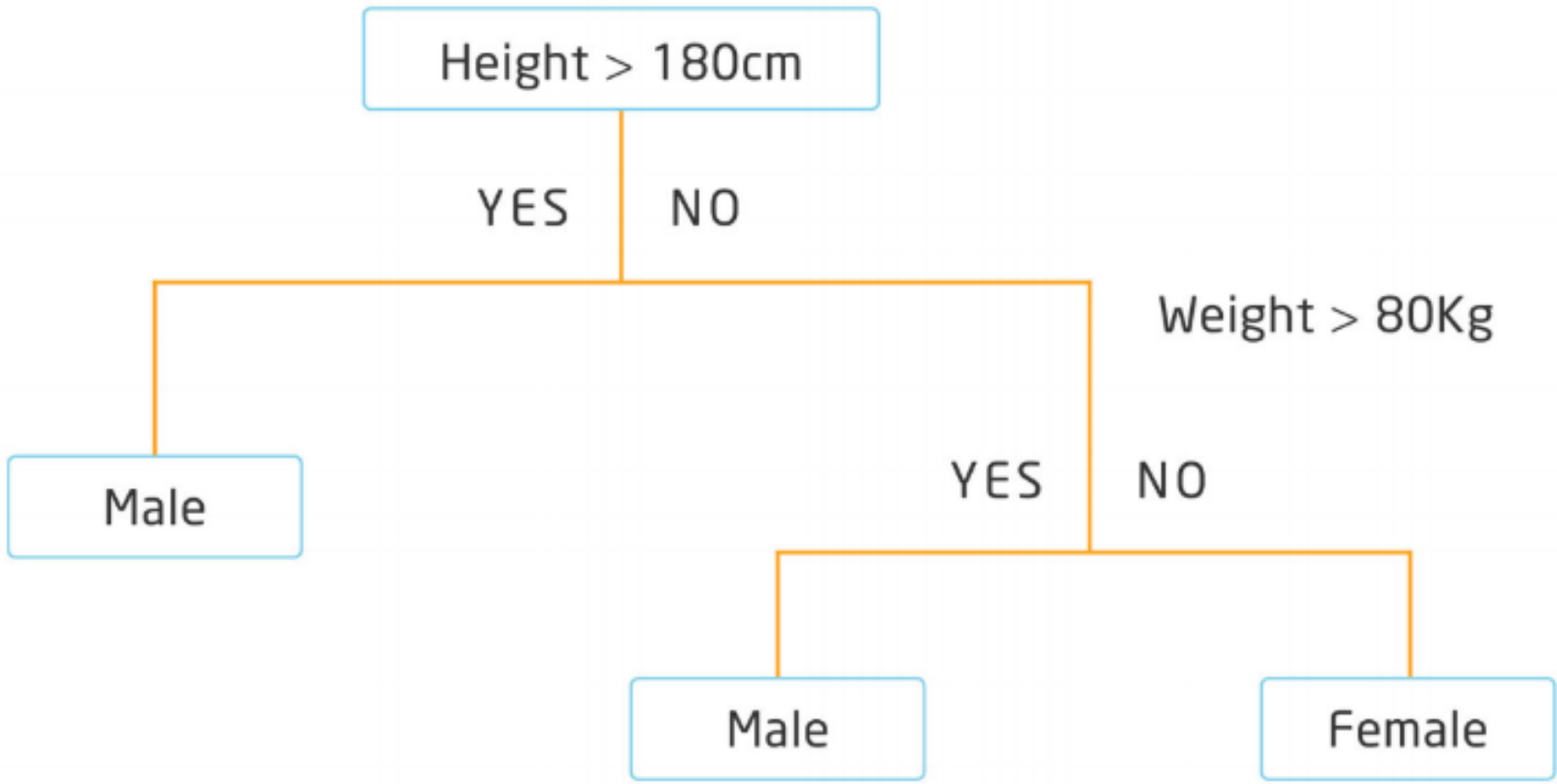
**Online Tracking**

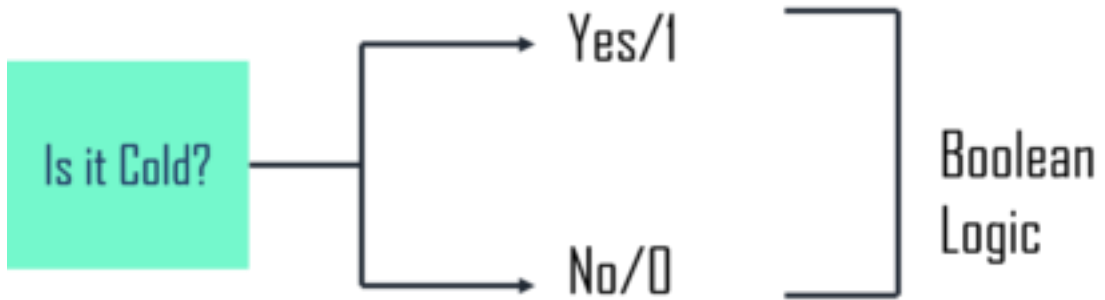


**Surveys**



**Forms**



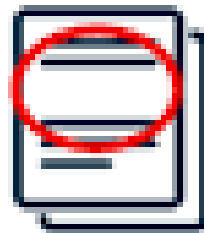




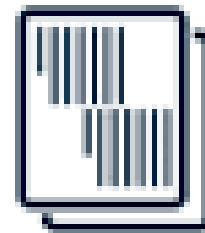
# BAD DATA IS...



Duplicate  
data



Missing  
data



Inaccurate  
data



Incorrect  
data







1 -







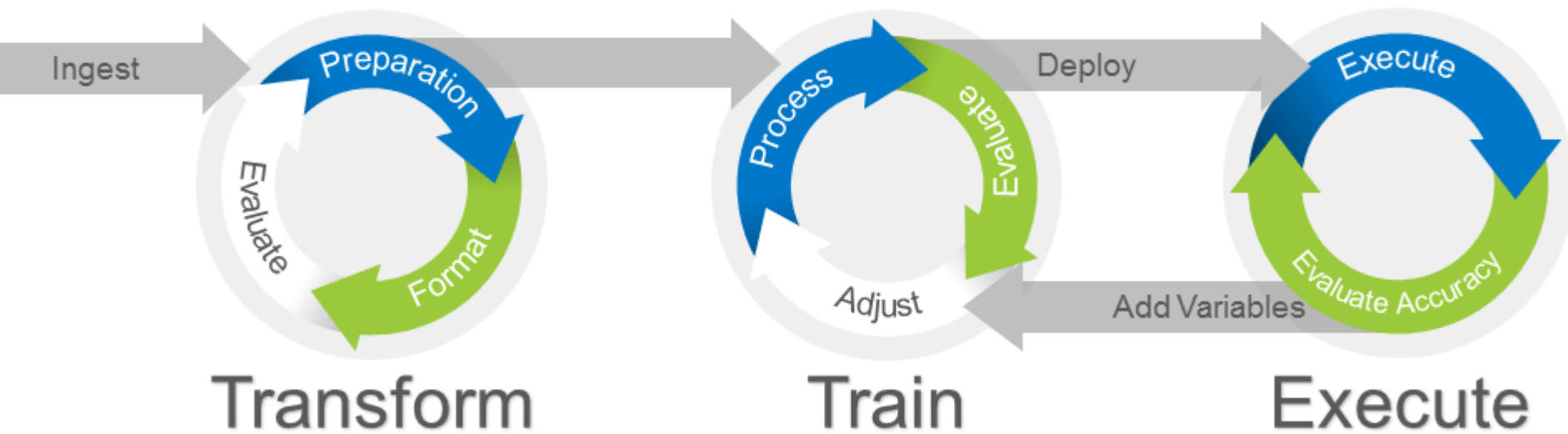
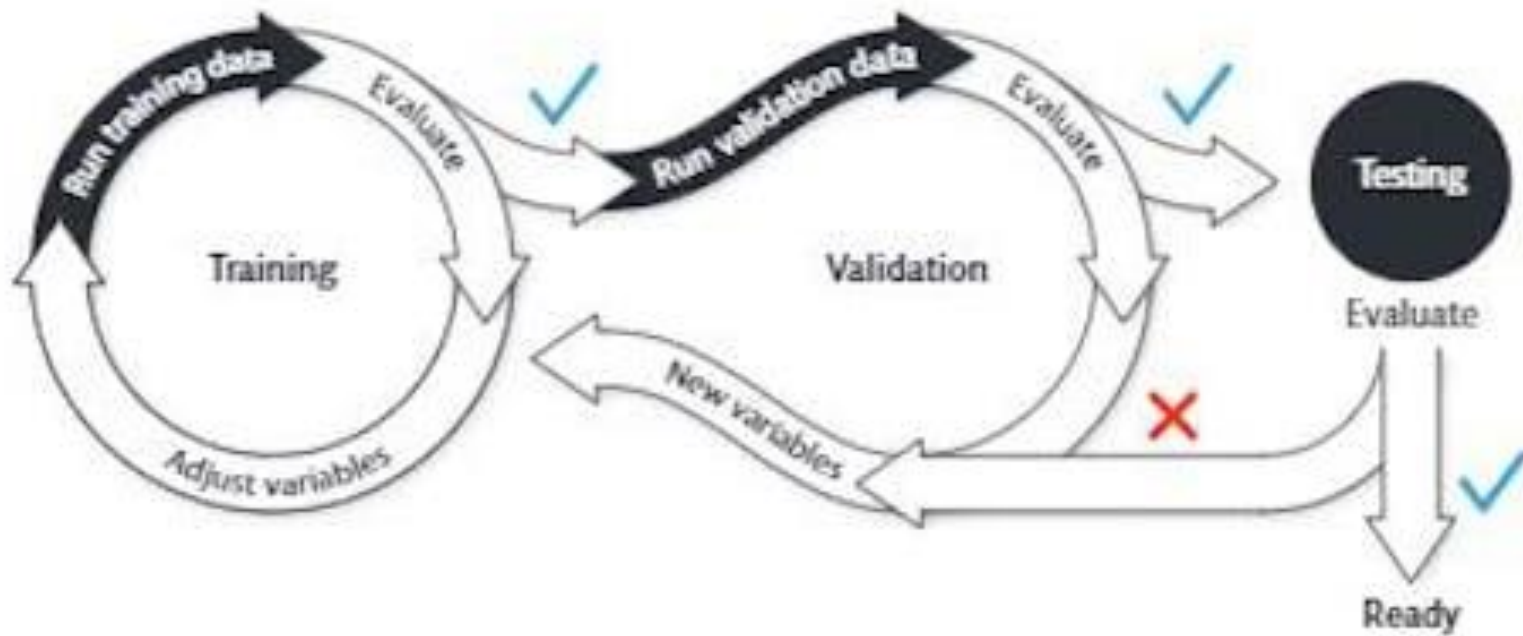
A



B







# Data Analysis Process



Business Problem  
Definition



Inventory and Data  
Collection



Data Cleaning



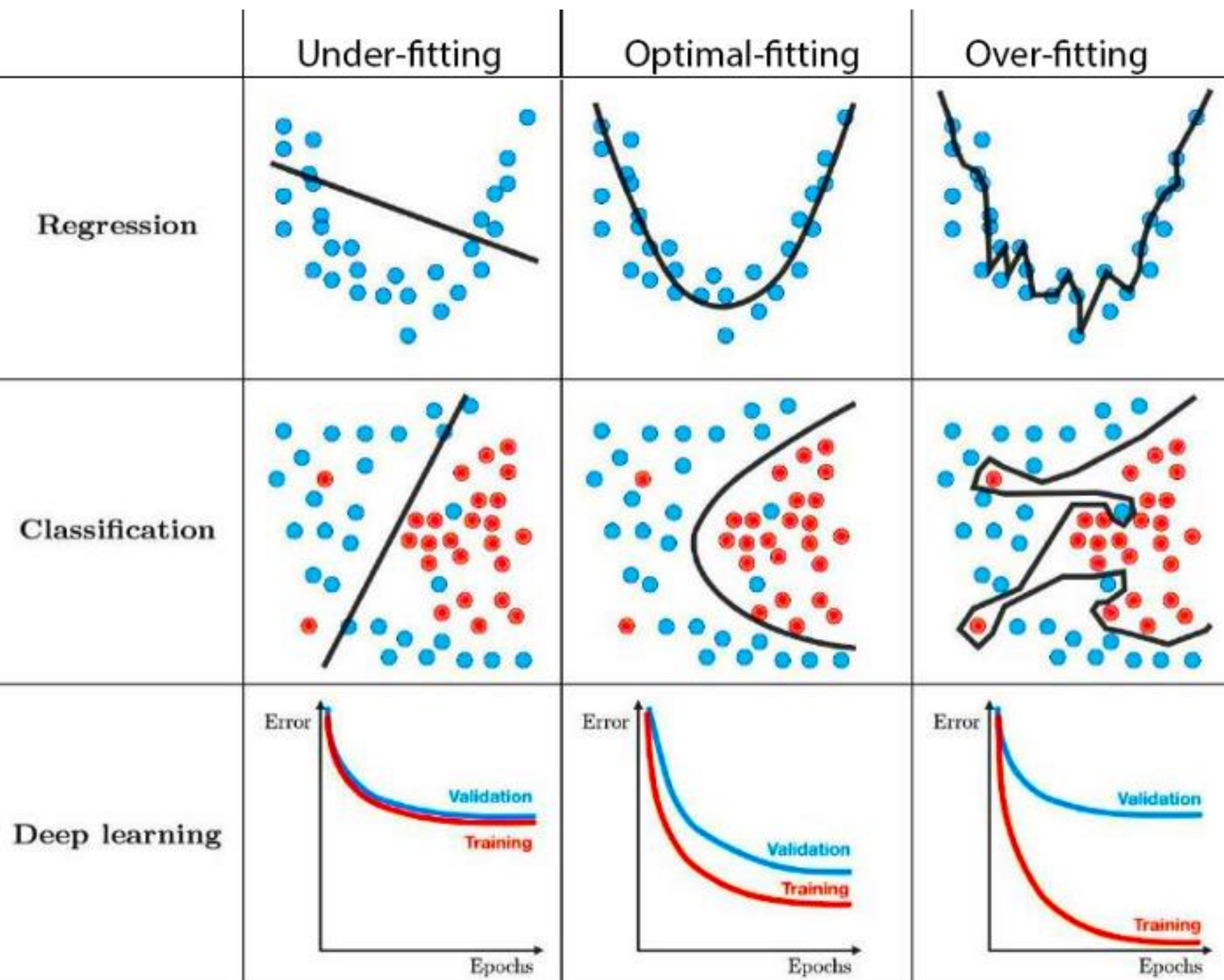
Data Analysis



Result Communication &  
Eventual Readjustment

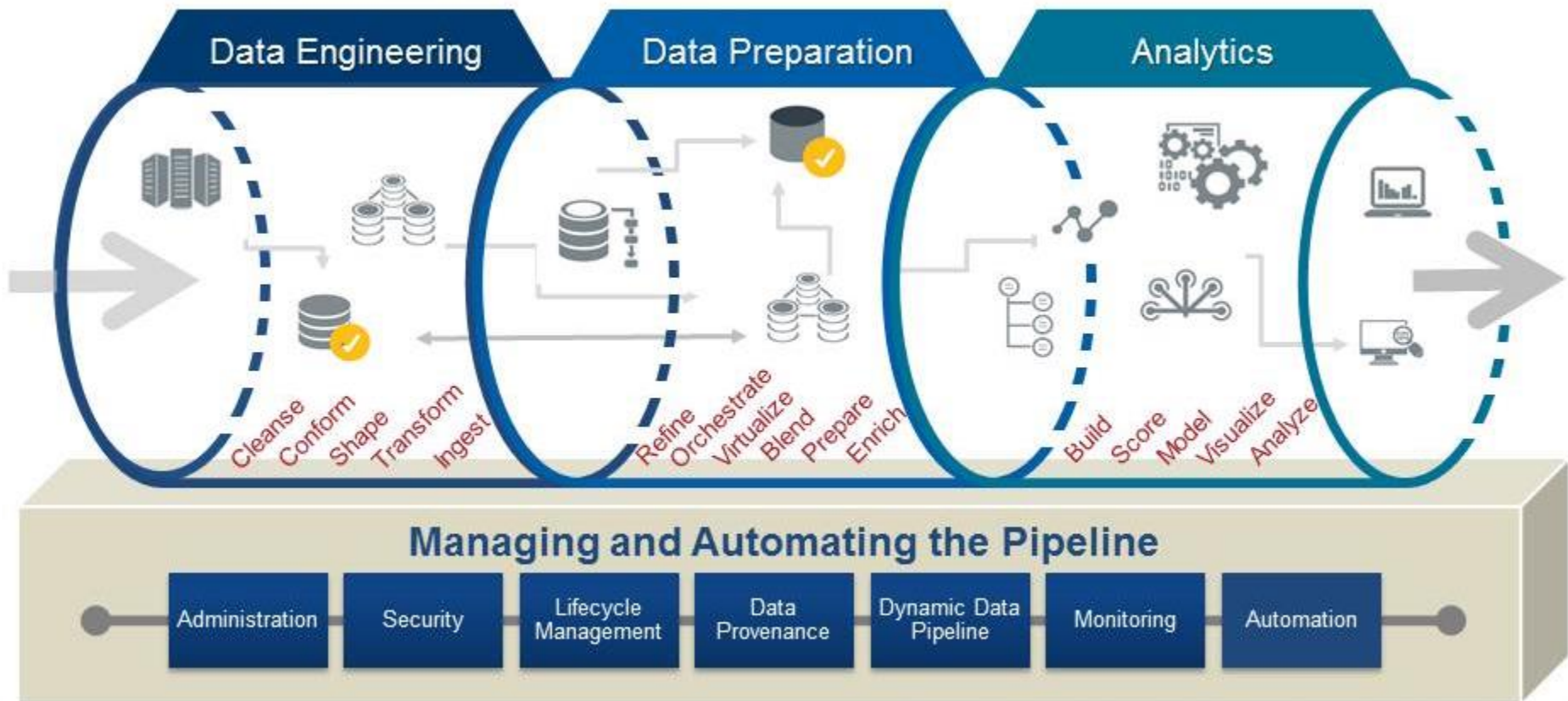


Choose The Right Model





# ANALYTIC DATA PIPELINE





**POOR DATASET**

+



**PERFECT MODEL**

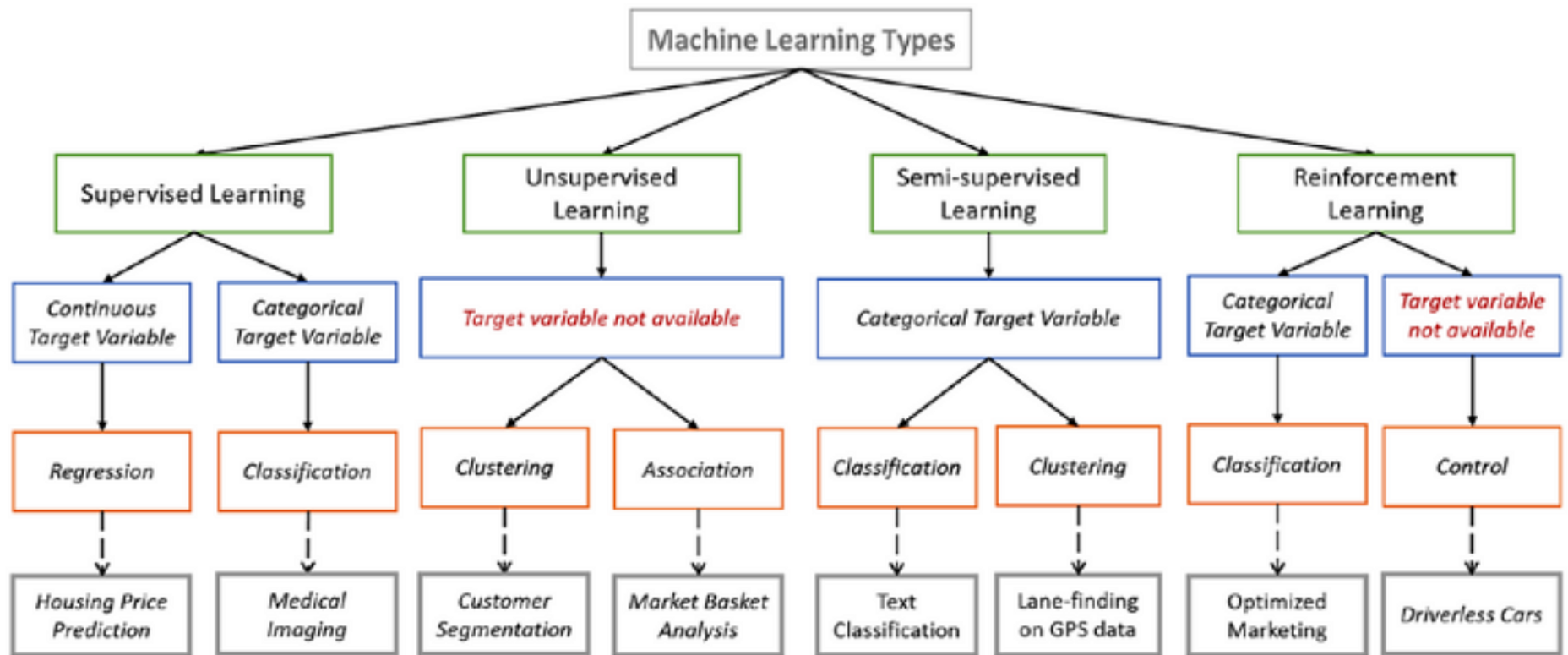
=

**PREDICTION:**

**BAD** ○

**GOOD** ○







**Bad DATA =  
Bad DECISIONS**



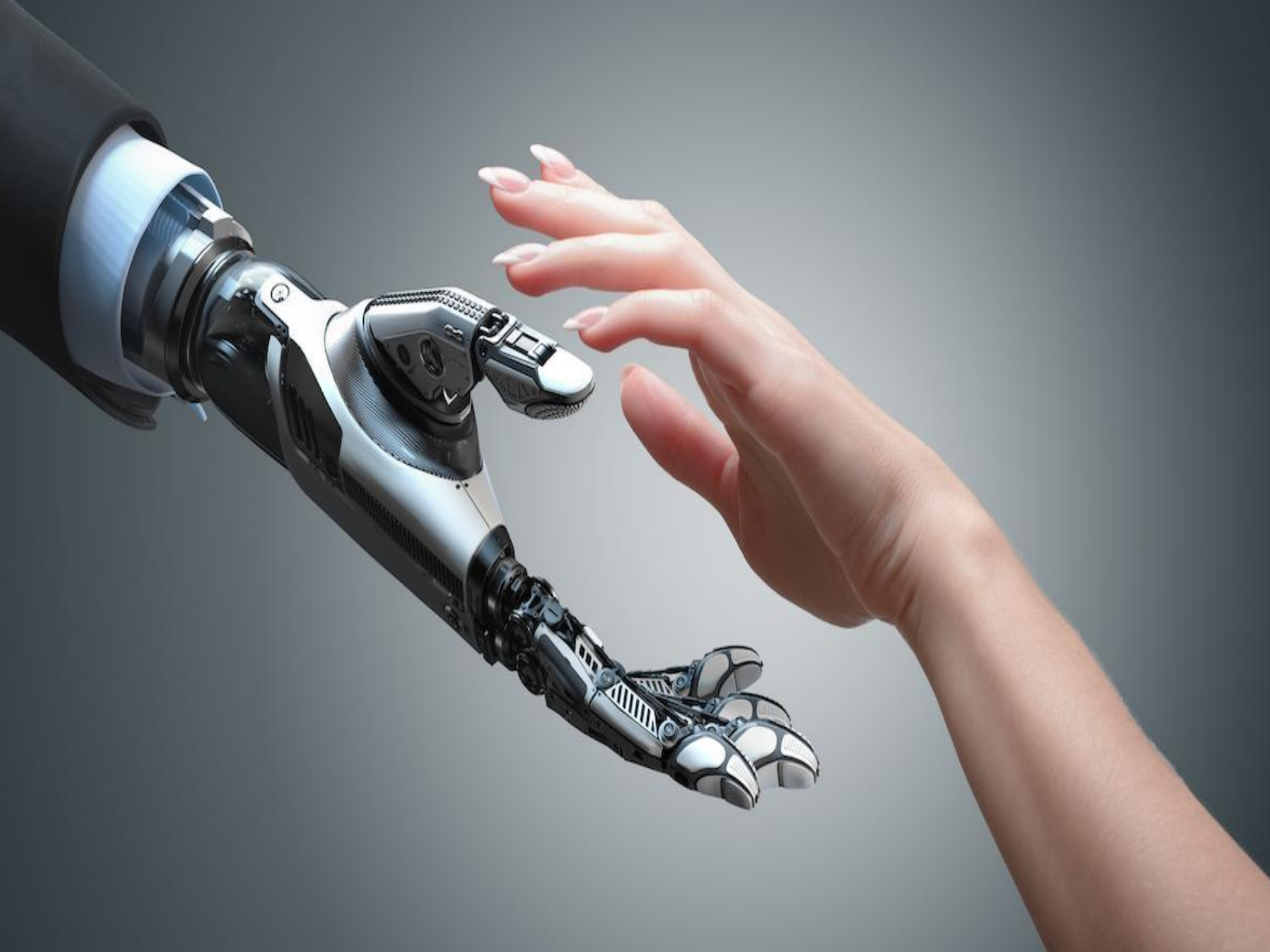
A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a vertical line of pins on its left edge. The letters 'AI' are white with a purple glow.

AI

KEY

CHALLENGES

INTEGRATION WITH EXISTING SYSTEMS



The diagram consists of five chevron-shaped boxes arranged in two rows. The top row contains three white boxes with red outlines, labeled 'Data Vision', 'Data Roadmap', and 'Data Culture' from left to right. The bottom row contains two solid red boxes, labeled 'Data Security' and 'Data Quality & Availability' from left to right. The boxes are positioned such that 'Data Security' is centered under 'Data Vision' and 'Data Roadmap', while 'Data Quality & Availability' is centered under 'Data Roadmap' and 'Data Culture'.

**Data Vision**

**Data Roadmap**

**Data Culture**

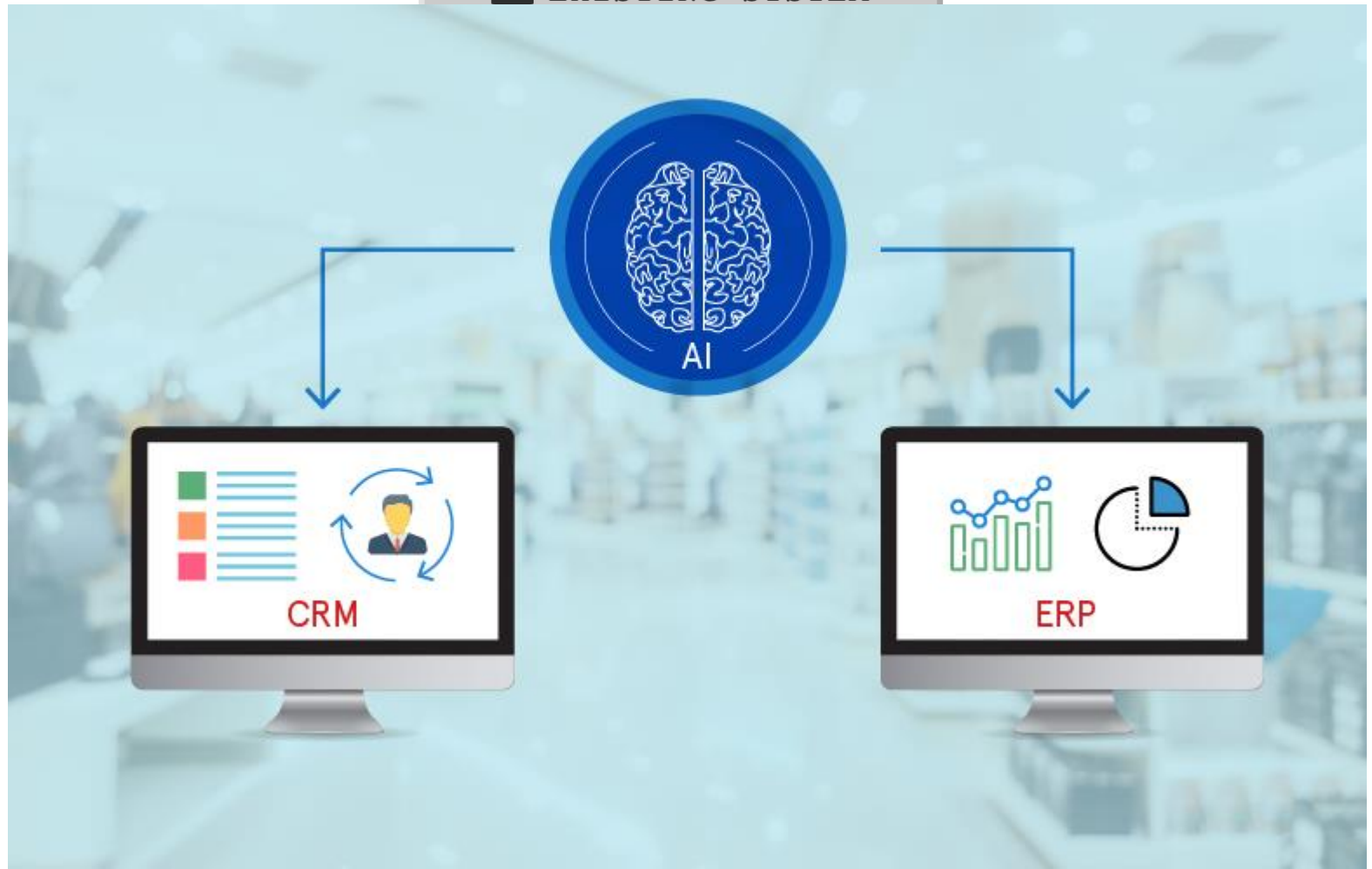
**Data Security**

**Data Quality &  
Availability**

 NEW SYSTEM



 EXISTING SYSTEM





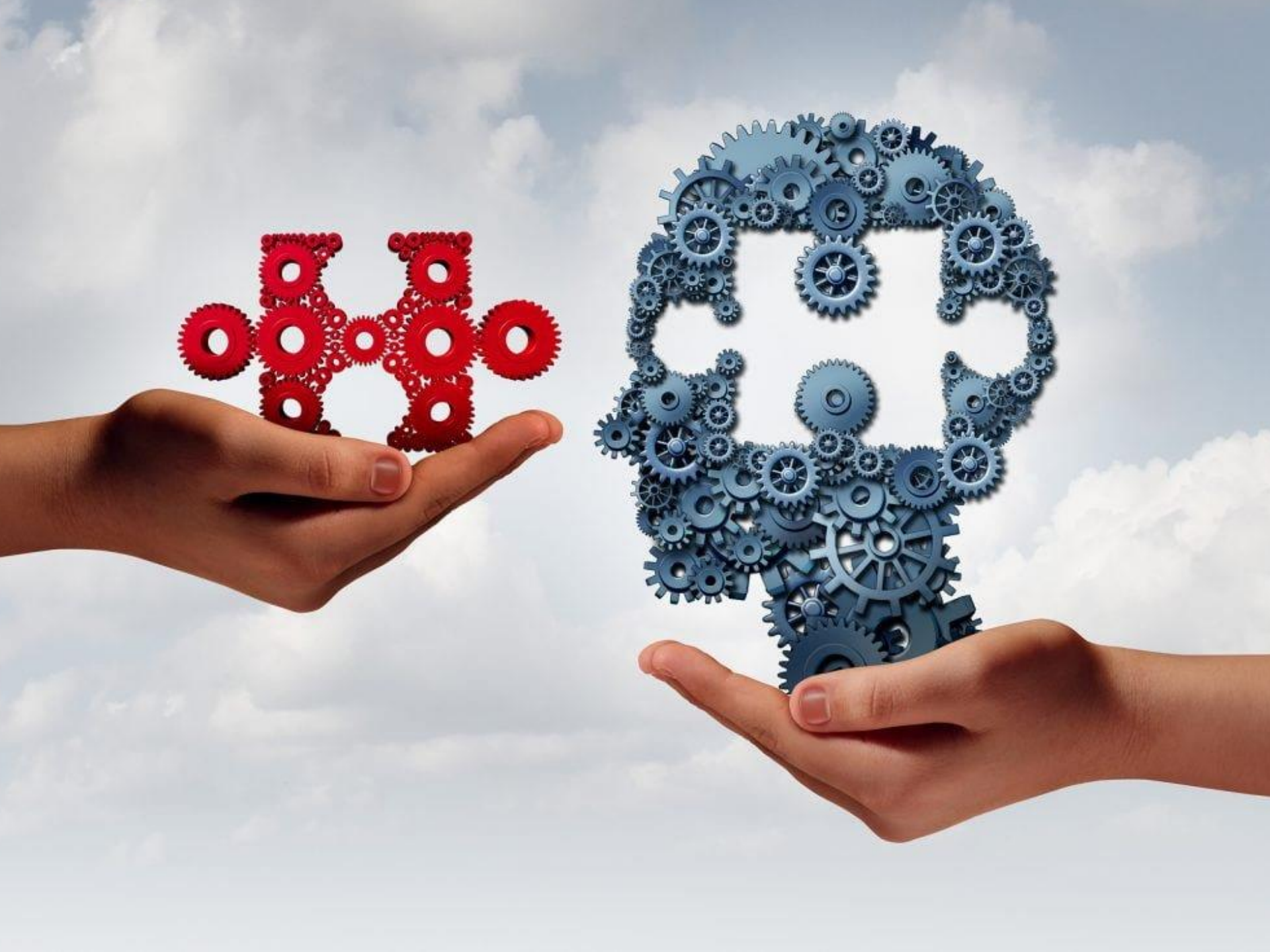
A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a vertical line of pins on its left edge. The letters 'AI' are white with a purple glow.

AI

KEY

CHALLENGES

LACK OF EXPERTISE/TALENT



A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a vertical line of pins on its left edge. The letters 'AI' are white with a purple glow.

AI

KEY  
CHALLENGES

COST OF INVESTMENT

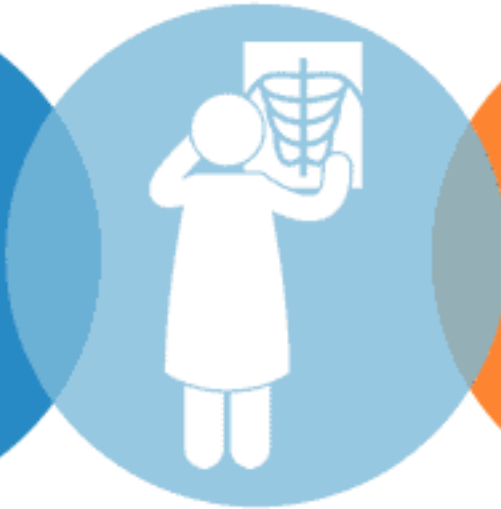






### **Descriptive**

Explains what happened.



### **Diagnostic**

Explains why it happened.



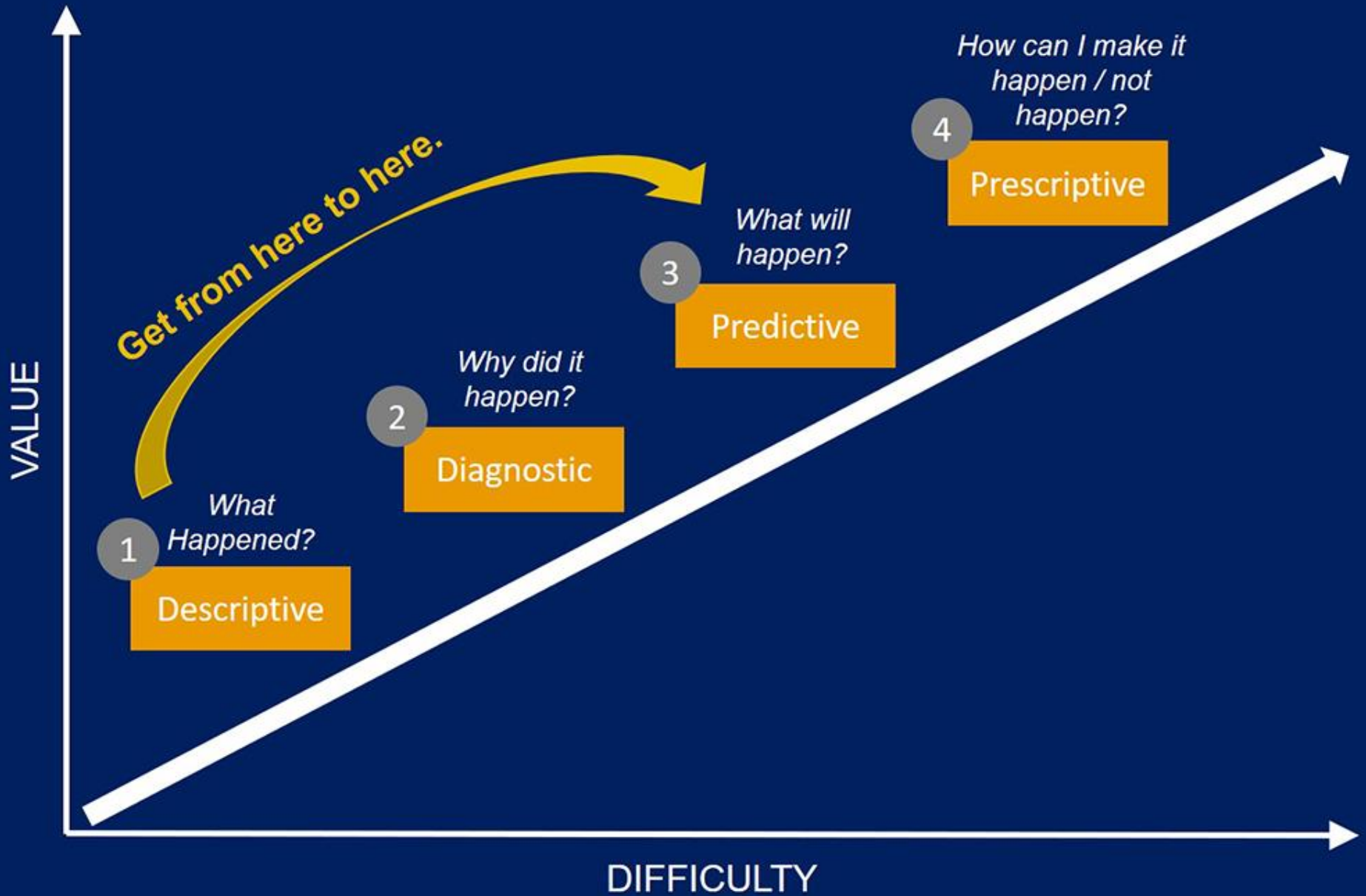
### **Predictive**

Forecasts what might happen.



### **Prescriptive**

Recommends an action based on the forecast.



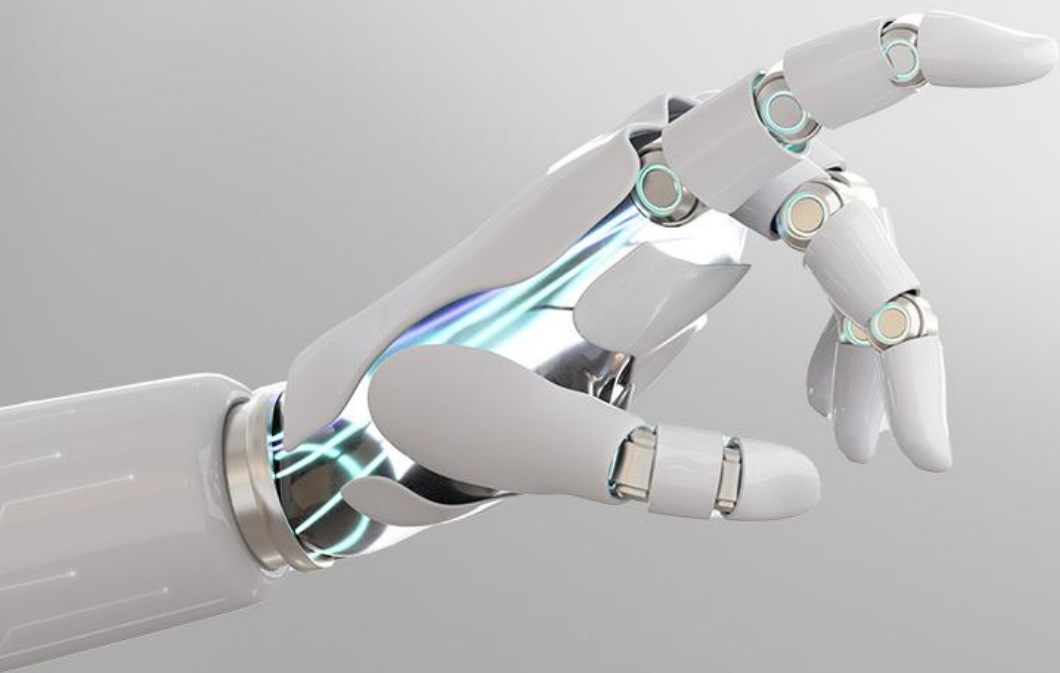
A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a dotted line on its left side. The background is a dark blue circuit board pattern with glowing blue lines and dots.

AI

KEY

CHALLENGES

ETHICAL AND LEGAL ISSUES





The diagram features a central red cloud-like shape containing a white chip icon with 'AI' on it. Below the chip, the words 'THREAT LANDSCAPE' are written in white. Surrounding this center is a network of grey lines connecting various circular icons. Some icons are highlighted with colored circles and text labels: an orange ear icon for 'EAVESDROPPING/ INTERCEPTION/ HIJACKING', a red flame icon for 'DISASTERS', a green virus icon for 'NEFARIOUS ACTIVITY', a black monitor with a lightning bolt for 'UNINTENTIONAL DAMAGES/ ACCIDENTAL', a green monitor with an exclamation mark for 'FAILURES/ MALFUNCTIONS', a blue circuit icon for 'OUTAGES', an orange gavel icon for 'LEGAL', and a black monitor with a hammer icon for 'PHYSICAL ATTACKS'. Other icons include a game controller, a bus, a leaf, a smartphone, a factory, and a person's head, all in grey.

# AI THREAT LANDSCAPE

EAVESDROPPING/  
INTERCEPTION/  
HIJACKING

DISASTERS

NEFARIOUS  
ACTIVITY

UNINTENTIONAL  
DAMAGES/  
ACCIDENTAL

FAILURES/  
MALFUNCTIONS

OUTAGES

LEGAL

PHYSICAL  
ATTACKS

# Responsible AI Principles

Displacement Strategy



Practical Accuracy



Human Augmentation



Bias Evaluation



Trust by Privacy



Data Risk Awareness



Explainability by Justification



Reproducible Operations





# ETHICAL

Regulation  
Privacy  
Mitigation of Bias  
Transparency  
Relevance



# LEGAL

Governance  
Confidentiality  
Liability  
Accuracy  
Decision Making

THE  
**7 ETHICAL QUESTIONS**  
ON  
**ARTIFICIAL INTELLIGENCE**

**BIAS**

What if AI is biased?

One risk is human bias entering the AI algorithm. Given that currently most AI development is happening in the private sector, this becomes even more serious.

**SECURITY**

Is AI fully secure?

What is it that we don't know today about AI security? There must be some way of ensuring the technology doesn't get into the hands of the bad actors.

**DECEPTION**

Could AI turn deceptive?

Some projects that start with noble intentions bow down to corporate pressure of making money, ideals be damned. Will AI deceive to make money?

**MALICE**

Will AI turn malicious?

Abusing technology isn't new, but with AI, the scale is huge. One question to never stop asking is how to ensure AI doesn't become malicious by intent.

**UNREGULATED**

Isn't AI too unregulated?

Just like with any completely new technology, we aren't sure of all the risks involved in artificial intelligence. The challenge is to regulate without stifling innovation.

**POLITICAL**

How about victimization?

All ruling powers are keen to vanquish opponents, but in authoritarian governments, the risk of AI being abused to victimize opponents is significantly higher.

**FOMO**

Will FOMO worsen things?

Companies in every country say, "If we don't do it, someone else will". Will corporates use this excuse and enjoy unbridled exploitation of AI?

# ETHICS IN AI

Privacy

Ensure there is no leak of personal confidential information

Accountability

The teams working with AI must own the responsibility of the decisions taken and the consequences

Safety

Control over what data is being used and in what context

Transparency

Ensure compliance with the human moralities

Respect for human values

Ensuring sensivity to different cultural norms and values

Fairness

No discrimination based on gender, race, caste, or creed

# **PRINCIPLES OF RESPONSIBLE ALGO SYS**

**LEGITIMACY AND COMPETENCY**

**MINIMIZING HARM**

**SECURITY AND PRIVACY**

**TRANSPARENCY**

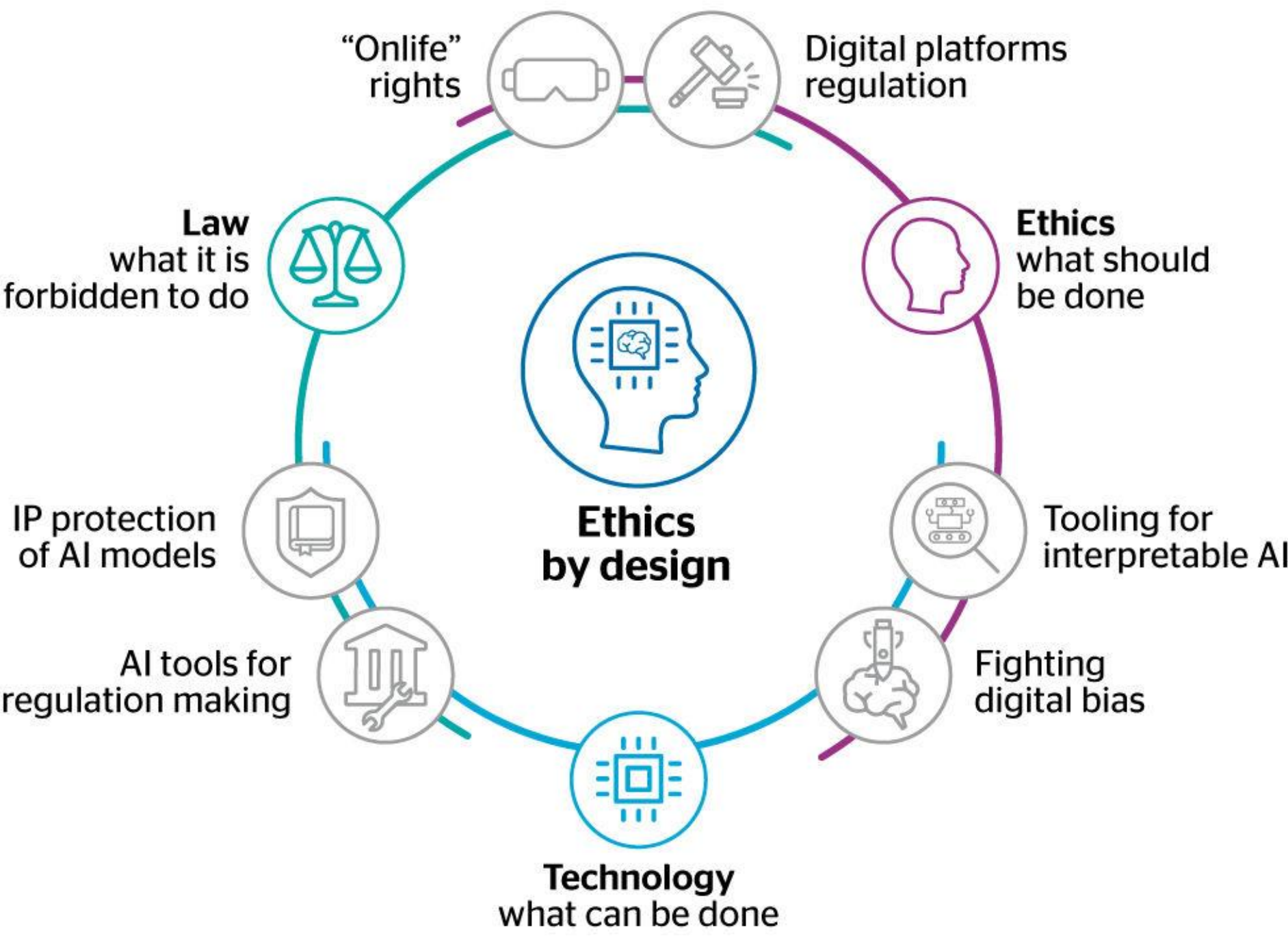
**INTERPRETABILITY AND EXPLAINABILITY**

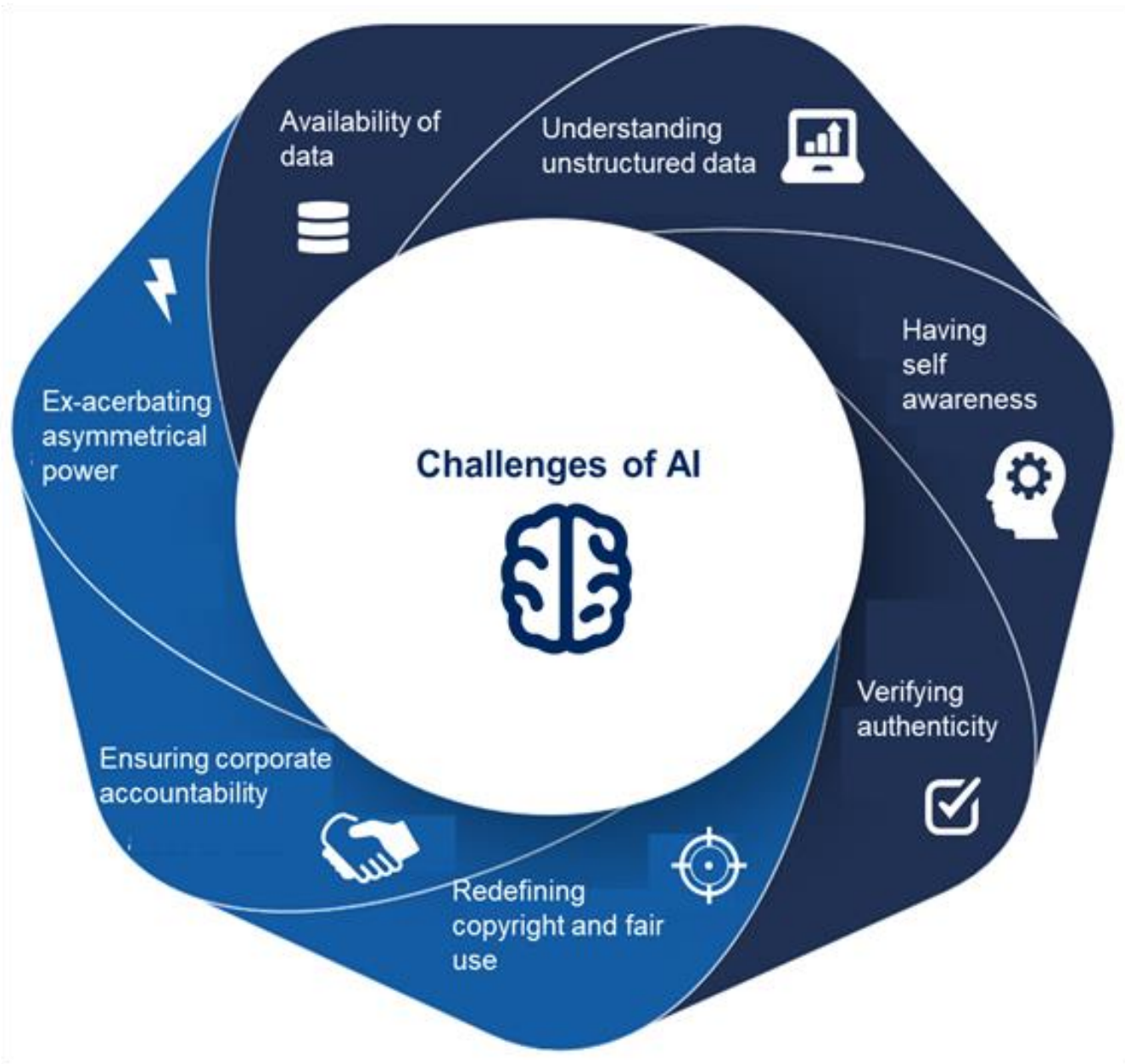
**MAINTAINABILITY**

**CONSTANTABILITY AND AUDITABILITY**

**ACCOUNTABILITY AND RESPONSIBILITY**

**LIMITING ENVIRONMENTAL IMPACTS**





A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a vertical line of pins on its left edge. The letters 'AI' are white with a purple glow.

AI

KEY

CHALLENGES

SECURITY AND COMPLIANCE

Data Security



V  
S

Data Privacy



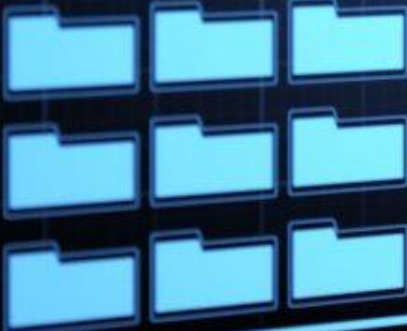




**DATA  
PRIVACY**



Confidential Data



[Identify Person]

Personal Data

Name

Home Address

Business Address

Identity Card No

Passport No

Driving License

Income Tax No

Car Registration

Other

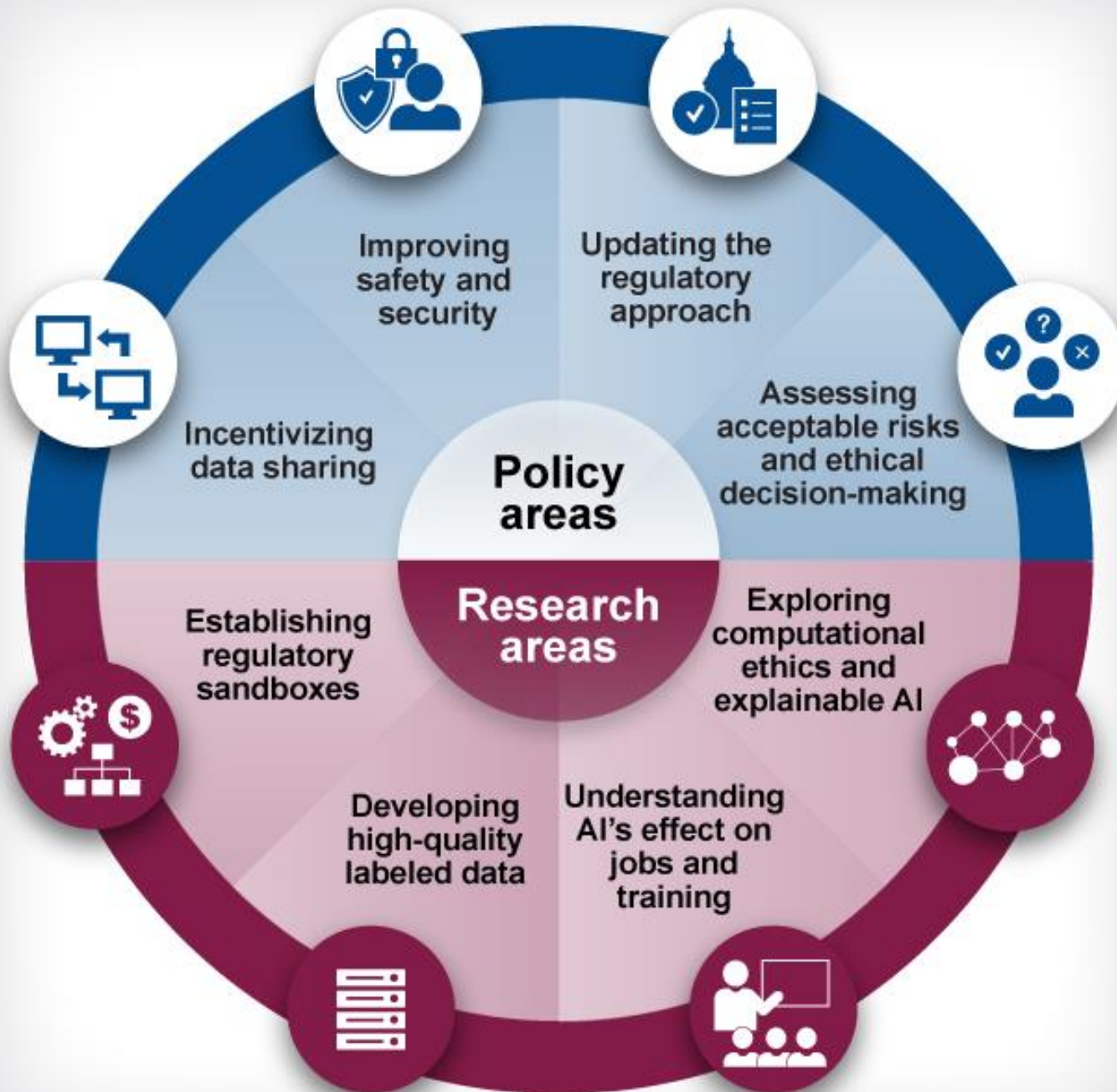
**Safe and Effective Systems** – You should be protected from unsafe or ineffective systems.

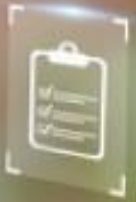
**Algorithmic Discrimination Protections** – You should not face discrimination by algorithms and systems should be used and designed in an equitable way.

**Data Privacy** – You should be protected from abusive data practices via built-in protections and you should have agency over how data about you is used.

**Notice and Explanation** – You should know that an automated system is being used and understand how and why it contributes to outcomes that impact you.

**Human Alternatives, Consideration, and Fallback** – You should be able to opt out, where appropriate, and have access to a person who can quickly consider and remedy problems you encounter.





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AI

KEY

CHALLENGES

TRANSPARENCY

**TRANSPARENCY**



- Don't deceive consumers about how you use automated tools.
- Be transparent when collecting sensitive data.
- If you make automated decisions based on information from a third-party vendor, you may be required to provide the consumer with an "adverse action" notice.

## Explain your decision to the consumer.

- If you deny consumers something of value based on algorithmic decision-making, explain why.
- If you use algorithms to assign risk scores to consumers, also disclose the key factors that affected the score, rank ordered for importance.
- If you might change the terms of a deal based on automated tools, make sure to tell consumers.

## Ensure that your decisions are fair.

- Don't discriminate based on protected classes.
- Focus on inputs, but also on outcomes.
- Give consumers access and an opportunity to correct information used to make decisions about them.

## Ensure that your data and models are robust and empirically sound.

- If you provide data about consumers to others to make decisions about consumer access to credit, employment, insurance, housing, government benefits, check-cashing or similar transactions, you may be a consumer reporting agency that must comply with the FCRA, including ensuring that the data is accurate and up to date.
- If you provide data about your customers to others for use in automated decision-making, you may have obligations to ensure that the data is accurate, even if you are not a consumer reporting agency.
- Make sure that your AI models are validated and revalidated to ensure that they work as intended, and do not illegally discriminate.

## Hold yourself accountable for compliance, ethics, fairness, and nondiscrimination.

- Ask questions before you use the algorithm.
- Protect your algorithm from unauthorized use.
- Consider your accountability mechanism.

<https://infotrusted.com/articles/ai-governance-in-the-united-states/>





# Principles of Responsible AI

## 1. Comprehensive

Clearly defined testing and governance criteria to prevent hacking and misuse

## 2. Explainable

Clearly defined purpose, rationale, and decision-making process that is understood by the average person

## 3. Ethical

Processes that eliminate bias in AI and ML systems and solutions and prevent occurrence of any kind of harm

## 4. Efficient

A requirement that ensures AI systems, products, and solutions run continually, respond quickly, are viable, and sustainable.

A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on its top and bottom edges and a vertical line of pins on its left edge. The letters 'AI' are white with a slight glow.

AI

KEY

CHALLENGES

JOB REDUNDANCY

# The challenges of artificial intelligence (AI) at the workplace

AI will disrupt the workforce as we know it but it will bring many benefits. Preparation is necessary.

AI alone is not directly linked to unemployment. There are many tasks AI cannot take over and automate.

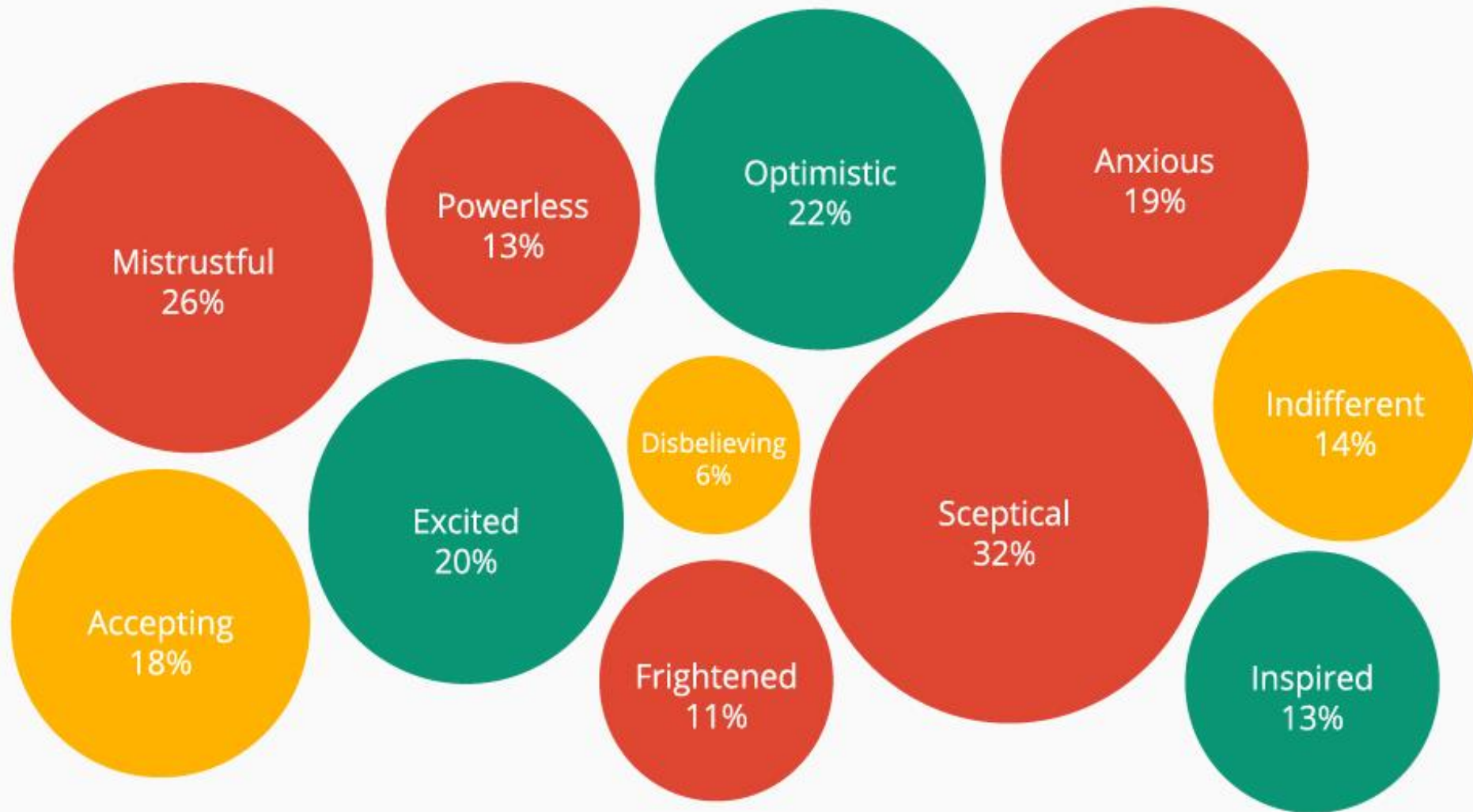


Future workplaces will integrate human and machine skills, which complement each other.

Crucial future skills for employers and employees include interpersonal and cognitive skills.

# Artificial Intelligence: Blessing or Curse?

% of adults in Great Britain who feel the following ways about artificial intelligence

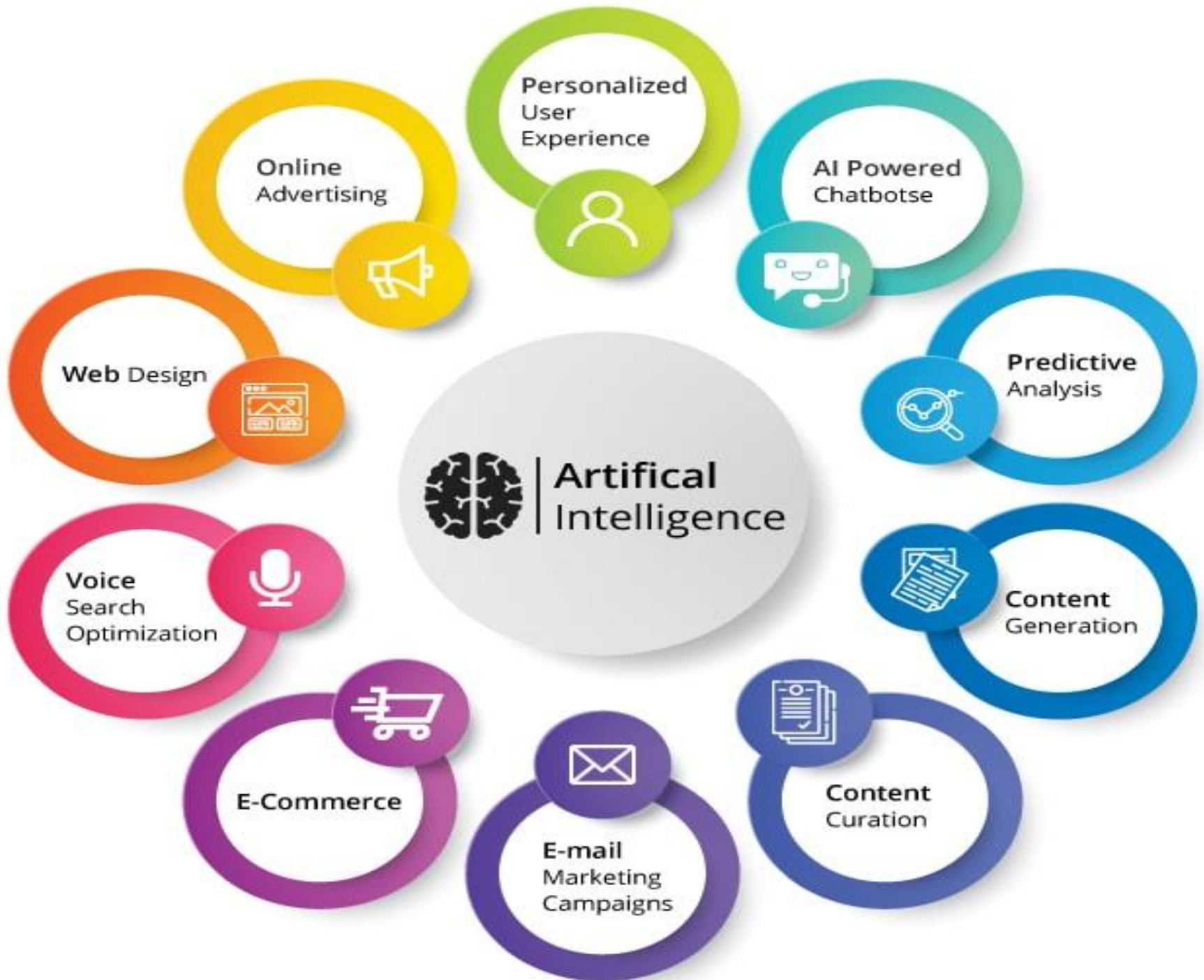


A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on the top and bottom edges and a dotted line on the left side. The letters 'AI' are white with a purple glow.

AI

KEY  
CHALLENGES

BUSINESS PERSPECTIVES



Personalized User Experience



AI Powered Chatbot



Online Advertising



Predictive Analysis



Web Design



Artificial Intelligence



Content Generation



Voice Search Optimization



Content Curation



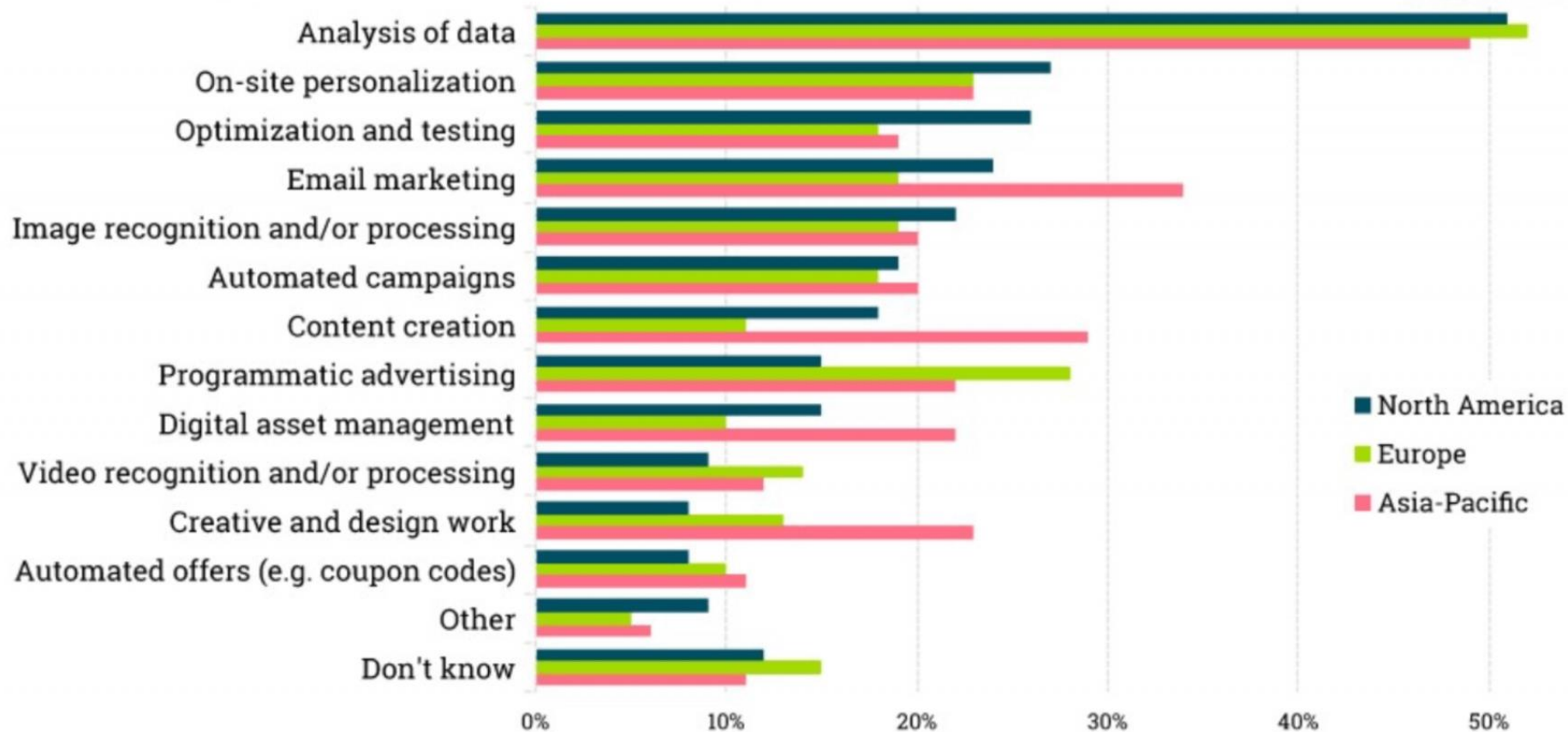
E-Commerce



E-mail Marketing Campaigns



# How Companies Are Currently Using AI







A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on the top and bottom edges and a vertical line of pins on the left edge. The letters 'AI' are white with a purple glow.

AI

KEY

CHALLENGES

ORGANSIATIONAL SUPPORT

# Key Challenges of AI adoption



# KEY CHALLENGES OF AI

AI algorithm bias



Black box problem



Requirement of high computing power



Complicated AI integration



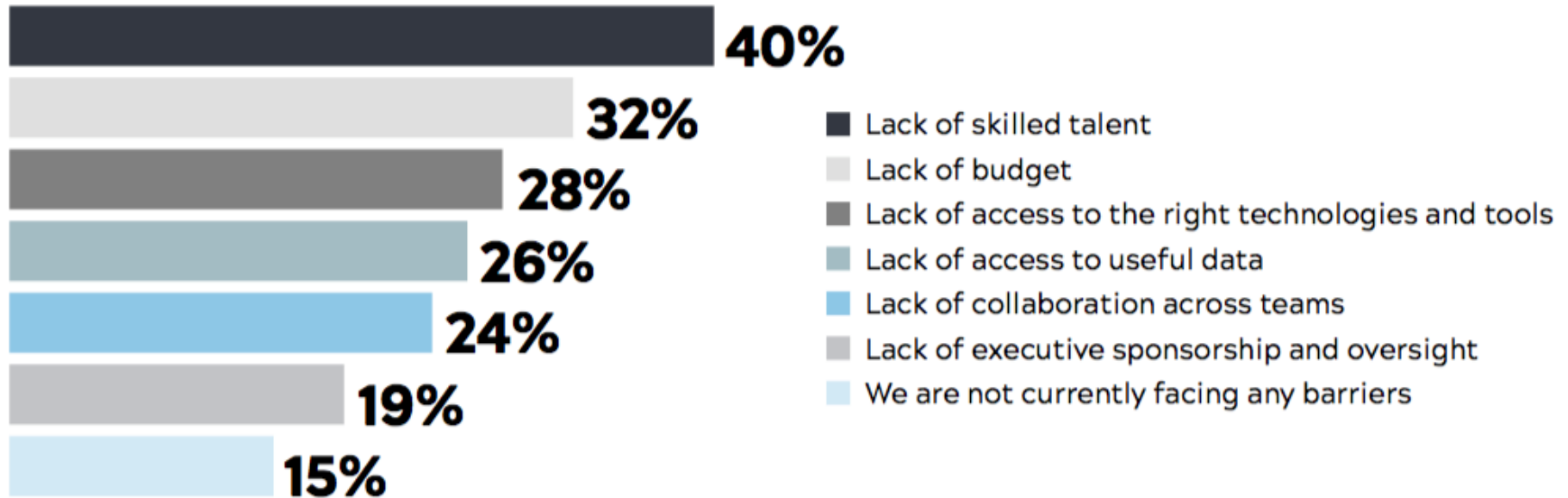
Lack of understanding of implementation strategies



Legal concerns



# What are the top barriers you are facing when executing your AL/ML initiatives



# FRAMEWORK

## Roles, Responsibilities & Budget

- Definition of relevant roles in the roll-out and operational phase
- Clear definition of IT and business responsibilities
- Selection of an appropriate budget (e.g. function-, project-, topic- or phase-based budgeting)

## Skills and Abilities

- Development and expansion of employee skills in technology, business and analytics
- New skills are needed; Identification and the procurement of these is necessary for employees

## Processes

- Identification of suitable processes in the company
- A long-term cross-company and evaluated use case portfolio with identified potentials

## Organization

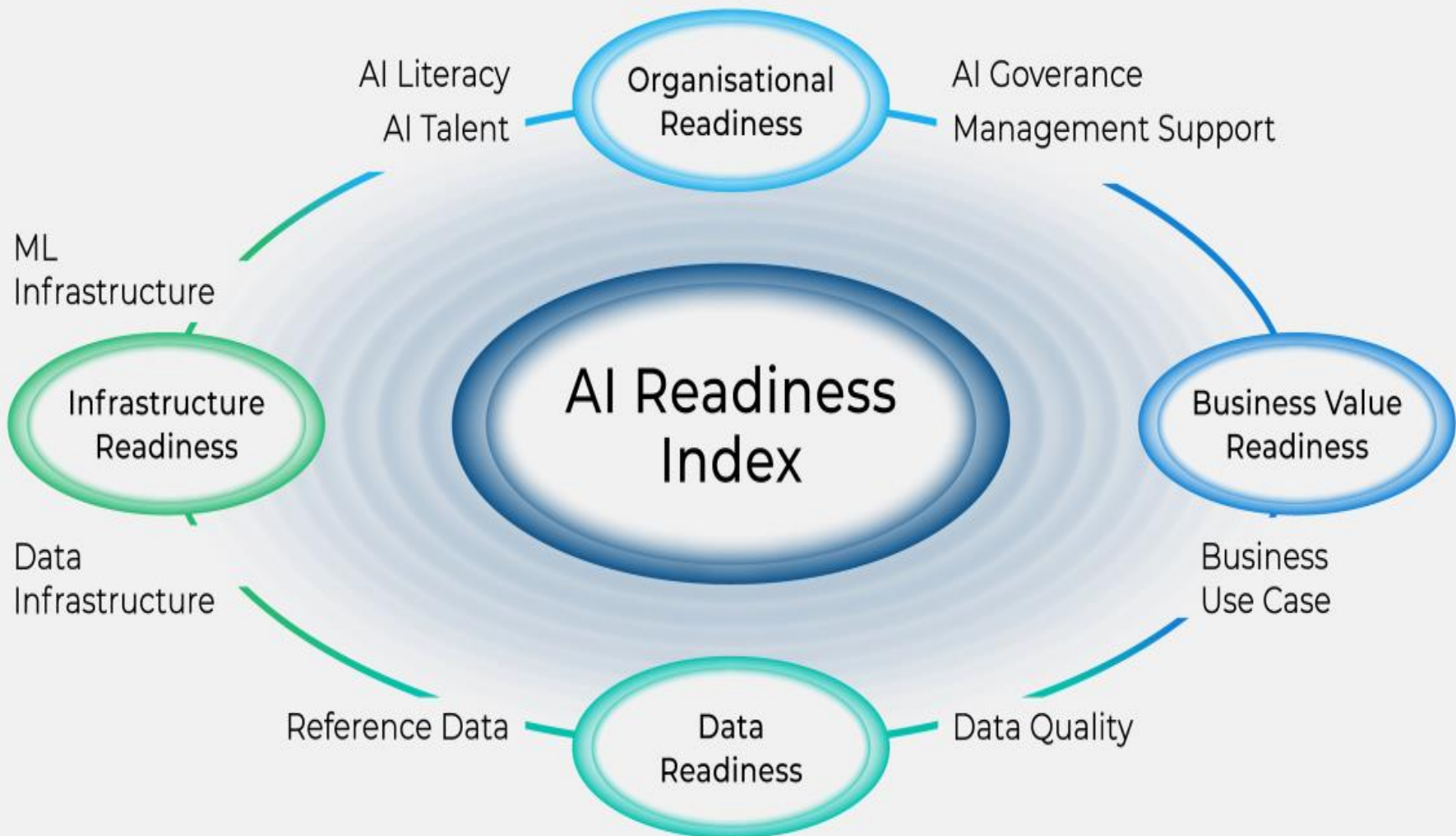
- Empowerment of the organization through
- transparent decision-making channels and fast decisions
- Integration into existing organizational structures
- Open communication policy for the involvement of all employees

The framework  
for successful  
AI projects

# AI READINESS INDEX -AIRI

a framework for evaluating the adoption of AI in businesses

The model is based on four pillars and nine dimensions



A graphic of a computer chip with the letters 'AI' in the center. The chip has a grid of pins on the top and bottom edges and a vertical line of pins on the left edge. The letters 'AI' are white with a purple glow.

AI

KEY  
CHALLENGES

INTERNET OF THINGS

## Just ask

*"Alexa, movie time"*

### With this command, Alexa will...

- Lower the shades
- Turn off the living room lights
- Turn off the music
- Turn on the TV

### To reset, just ask:

*"Alexa, reset movie time"*



## Just ask

*"Alexa, turn on the TV"*

*"Alexa, show me the front door"\**

*"Alexa, play 'Tumble Leaf'"\**

### To reset the Fire TV, just ask:

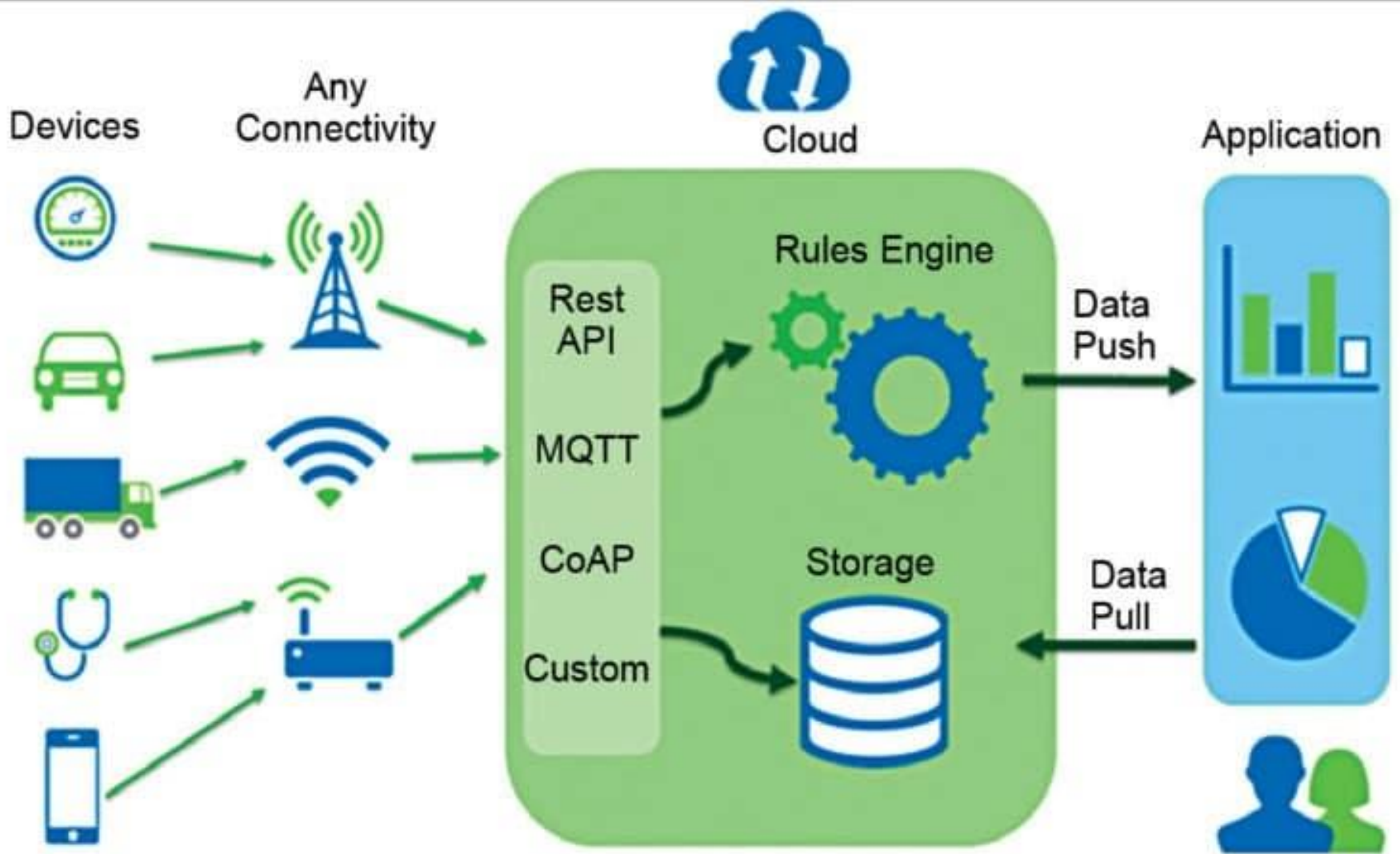
*"Alexa, go home"*

*\*TV must be on*

amazon



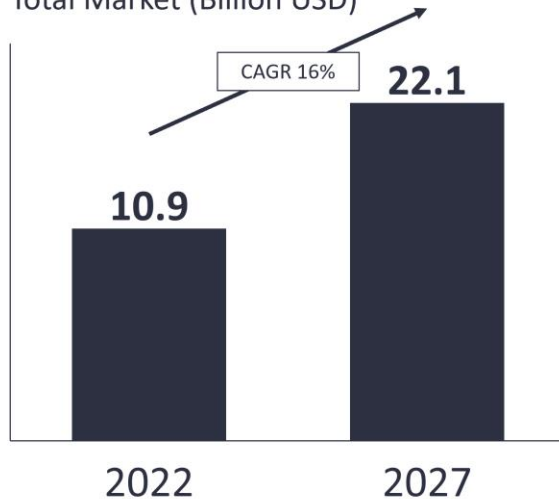




# Market Snapshot: IoT Sensor Market 2022

## Market Size

Total Market (Billion USD)



## Leading vendors (selection)

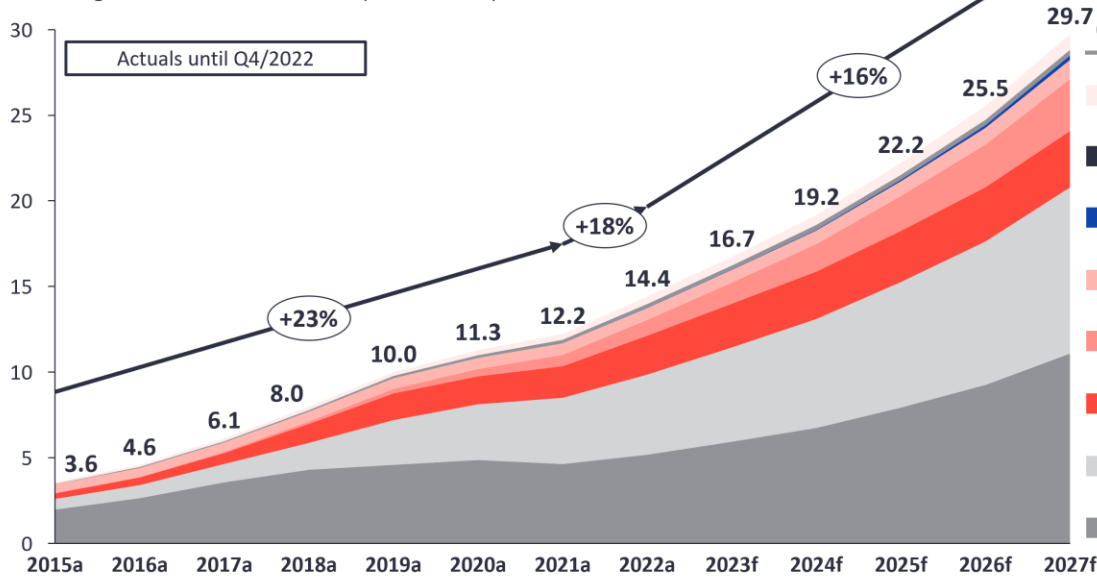


## 5 trending technologies

1	Smart sensors
2	Power-efficient sensors
3	Soft & Virtual sensors
4	Sensor fusion
5	Biosensors

# Global IoT market forecast (in billions of connected IoT devices)

Number of global active IoT connections (installed base) in billions



Connectivity type	CAGR 21–22	CAGR 22–27
Other	21%	17%
Wireless Neighborhood Area Networks (WNAN)	15%	8%
Cellular 5G IoT	200%	87%
Wired IoT	5%	10%
LPWA	38%	27%
Cellular IoT (excl. 5G, LPWA)	22%	8%
Wireless Local Area Networks (WLAN)	21%	16%
Wireless Personal Area Networks (WPAN)	12%	16%

xx% = CAGR

**Note:** IoT connections do not include any computers, laptops, fixed phones, cellphones, or consumers tablets. Counted are active nodes/devices or gateways that concentrate the end-sensors, not every sensor/actuator. Simple one-directional communications technology not considered (e.g., RFID, NFC). Wired includes ethernet and fieldbuses (e.g., connected industrial PLCs or I/O modules); Cellular includes 2G, 3G, 4G, 5G; LPWA includes unlicensed and licensed low-power networks; WPAN includes Bluetooth, Zigbee, Z-Wave or similar; WLAN includes Wi-Fi and related protocols; WNAN includes non-short-range mesh, such as Wi-SUN; Other includes satellite and unclassified proprietary networks with any range.

**Source:** IoT Analytics Research 2023. We welcome republishing of images but ask for source citation with a link to the original post and company website.

A graphic of a computer chip with the letters 'AI' in the center. The chip has a white border and a grid of pins on the top and bottom. The letters 'AI' are white with a purple glow.

AI

ROAD  
AHEAD

THE PATH HAS JUST BEEN TAKEN

The infographic features a central white circle with the title 'Advantages of Artificial Intelligence' in purple. Five colored petals radiate from the center, each containing an advantage in white text. The background is a dark blue digital space with binary code (0s and 1s) and glowing circuit lines.

# **Advantages of Artificial Intelligence**

**Reduction in  
Human Error**

**Unbiased  
Decision  
Making**

**Assistance  
on Digital  
Platforms**

**Better  
Risk-taking  
Capabilities**

**Available  
24x7**

# USAGES OF ARTIFICIAL INTELLIGENCE

## Politics & Government

- Targeted campaigning
- Public opinion monitoring
- Anticipating infrastructure failures and maintenance

## Banking & Personal Finance

- Fraud prevention as AI learns what types of transactions are fraudulent
- Credit decisions
- Client segmentation

## Transport

- Reducing travel times through analysing traffic
- Ride sharing apps - determining the price, supply chain prediction
- Autonomous vehicles

## Retail Spaces

- Cashless stores
- Virtual mirrors
- Footfall analysis and store optimisation

## Education

- Plagiarism checkers
- Automated grading
- Customised digital learning interfaces
- Virtual teachers or lecturers
- Adaptive learning

## Communication

- Spam filters on your emails
- Text and email reply suggestions
- Real time translation
- Emotion analytics

## Gaming

- Thought-controlled gaming
- Improved visual quality
- Gesture control
- AI coach
- Facial recognition for 3D avatars

## Media

- Automated journalism
- Eliminating fake news
- Data analysis
- Bias removal
- Content analysis for organisation

## Hospitality

- AI concierge
- Smart hotel rooms
- Personalised communications
- Predictive supply chain

## Entertainment

- Music suggestions (Spotify, Apple Music, Google Play Music)
- Automatic music creation
- Film and TV suggestions (Netflix, Amazon Prime, Hulu)
- Marketing and advertising personalisation
- Search optimisation

## Workplace

- Robotics in manufacturing
- Automated safety checks in factories
- Autonomous haulage
- Enhanced recruitment
- Automated timesheets (e.g. Blackbelt)

## Mobile

- Voice-to-text
- Smart personal assistants like Alexa, Echo, Cortana, Google Assistant...

## Sports

- Wearable tech to analyse performance
- Smart ticketing
- Automated video highlights

## Aerospace

## Online Shopping

- Search recommendations

## Healthcare

- Autonomous surgical robots
- Automatic disease identification and diagnosis
- Personalised treatment
- Drug discovery
- Identifying candidates for clinical trials
- Epidemic outbreak prediction
- Automation of routine tasks like X-Rays, CT scans, data entry
- Health monitoring/wearable health trackers
- Virtual doctors

## Agriculture

- Robot harvesters
- Computer vision to monitor crop and soil health
- Predictive analysis for environmental impacts on crops

## Real Estate

- Targeted advertising
- Market analysis
- Client segmentation

## Social Networks

- Photo recognition
- Newsfeed personalisation
- Friendship suggestions
- Augmented reality filters
- Chatbots
- Automated video/music synchronisation

## Defence

- Unmanned Aerial Vehicles (UAVs)
- Civilian detection
- Autonomous decision making
- Target identification
- Diagnosis and maintenance of weapons systems
- War gaming, simulation and training

## Smart Homes

- Personal assistants
- Automatic goods ordering
- Home security
- Temperature and light control

## Cybersecurity

- Incident detection
- Accelerated incident response

## Insurance

- Risk identification
- Personalised pricing
- Client support

## Events

- Facial recognition to scan attendees
- Personalised recommendations
- Sales chatbots

# TOP 5 AI TRENDS

1

Computer vision  
set to grow



2

Boost to autonomous  
vehicle industry



3

Chatbots and virtual  
assistants to get smarter



4

Solutions for  
metaverse



5

Improved language  
modeling







**IoT**  
INTERNET OF THINGS

## EXAMPLES OF AI IN INVESTING



The Halley Fund

## EXAMPLES OF AI IN MANUFACTURING



The Halley Fund

## EXAMPLES OF AI IN CUSTOMER SERVICE



The Halley Fund

**WAYS AI IS CONTRIBUTING TO WEB DEVELOPMENT**

Real-time suggestions

Making coding easy

Enhancing the user experience

Quality assurance

Convert sketches into wireframe modules

Track user behavior

Improves Accuracy

Detect bugs in coding

Generate layout designs based on user input data

Optimize images, videos, and other content types

# Key Challenges - AI & Telemedicine

## Augmented AI or Autonomous AI?

RPA / AI Solution  
Design

## AI Explainability

Predictions  
Interpretability

## Ethical AI

Traceability, epistemic,  
normative risks

## AI Governance

QA (test, test, test)/  
monitoring / retraining

## Data Preparation

Data gathering /  
cleaning, annotation

## Data Security

Secured Data  
Access

## Compliances & Regulations

QA, Change Control

## Cloud-native Design

Hybrid-cloud Solution  
Design

# Challenges in supply chain that **Machine Learning can solve**

Supply chain market research shows that the majority of companies (69%) don't have complete visibility of their supply chains, as per BCI Supply Chain Resilience Report.

Here are a few of the challenges faced by logistics and supply chains that Machine Learning and Artificial intelligence-powered solutions can solve:



**Poor Resources Planning**



**Inefficient Supplier Relationship Management**



**Satisfying Customer Needs**



**Quality and Safety**



**Technical Downtimes**



**Cost Inefficiency**



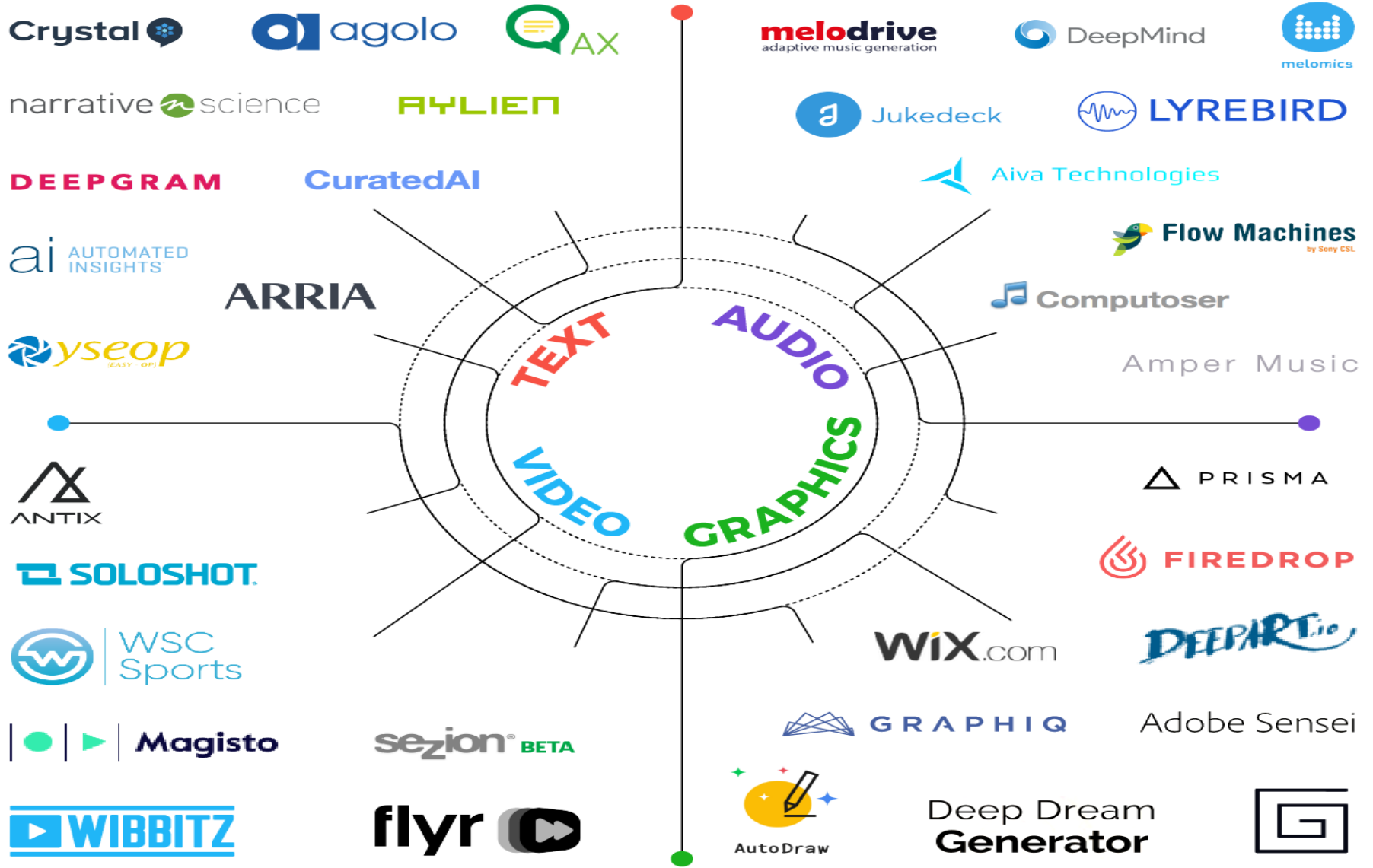
**Determining Pricing**

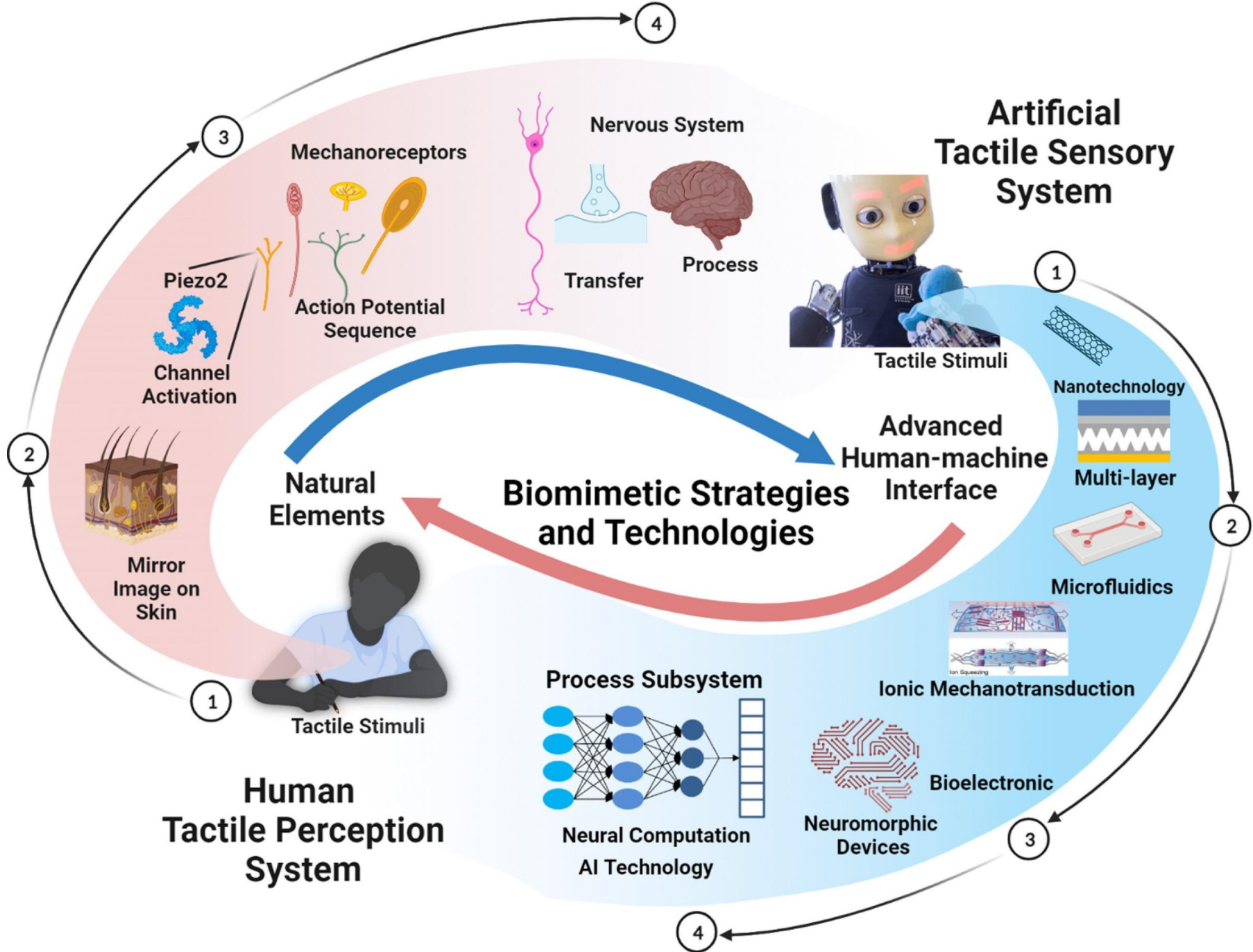


**Transportation Costs**

# AI COMPANIES

## FOR CONTENT CREATORS

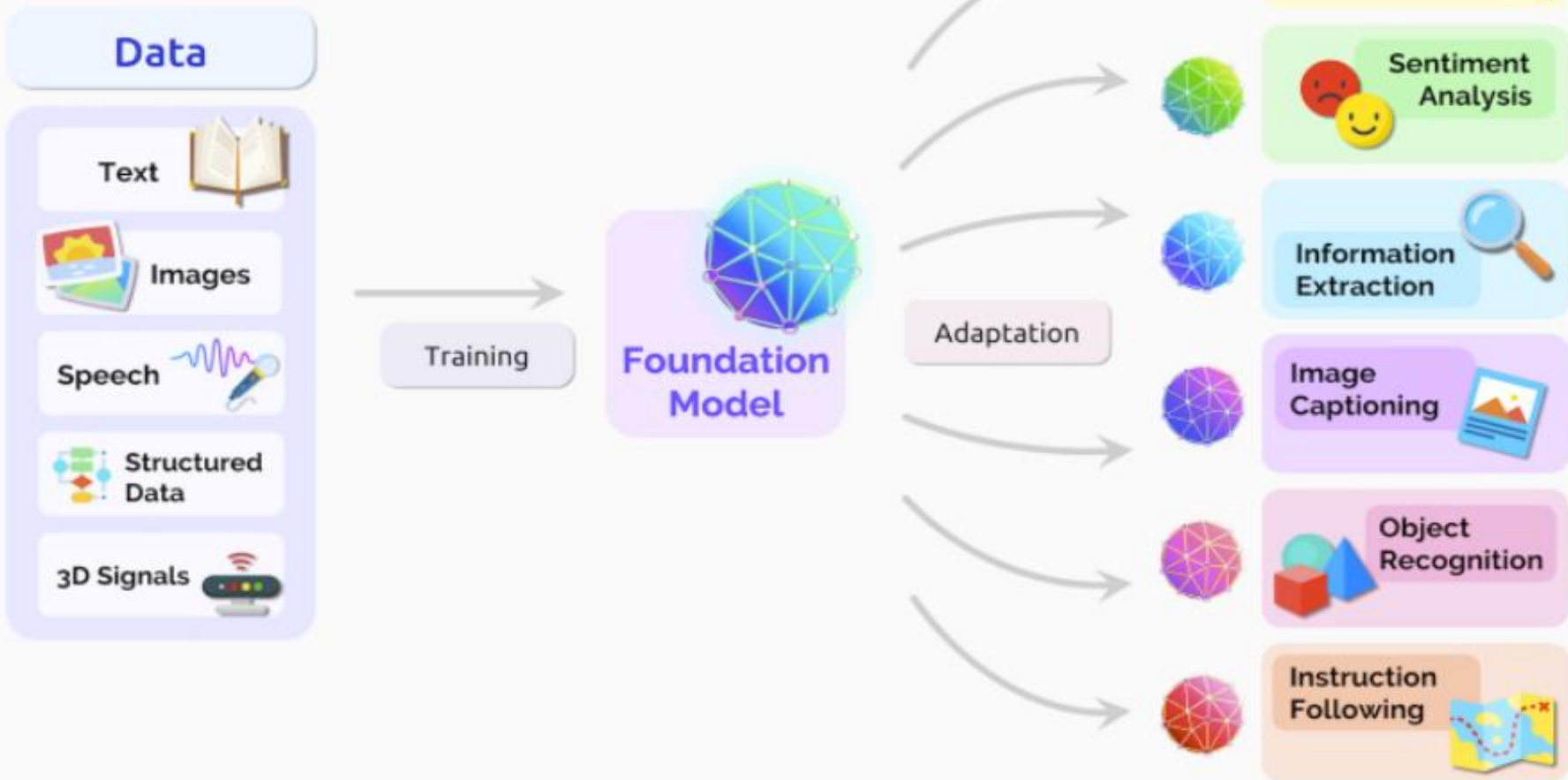
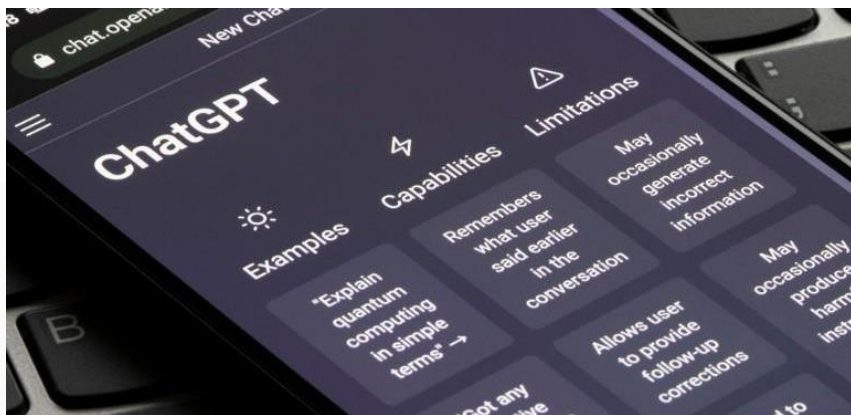




# GENERATIVE AI

The image features a vibrant, futuristic cityscape at night, illuminated with a mix of blue and purple lights. The buildings and streets are densely packed, creating a sense of depth and activity. Overlaid on this scene is a complex network of white lines and blue squares, resembling a data flow or neural network diagram. The lines connect various points across the frame, with some squares acting as nodes. The overall aesthetic is high-tech and digital, emphasizing the theme of artificial intelligence.





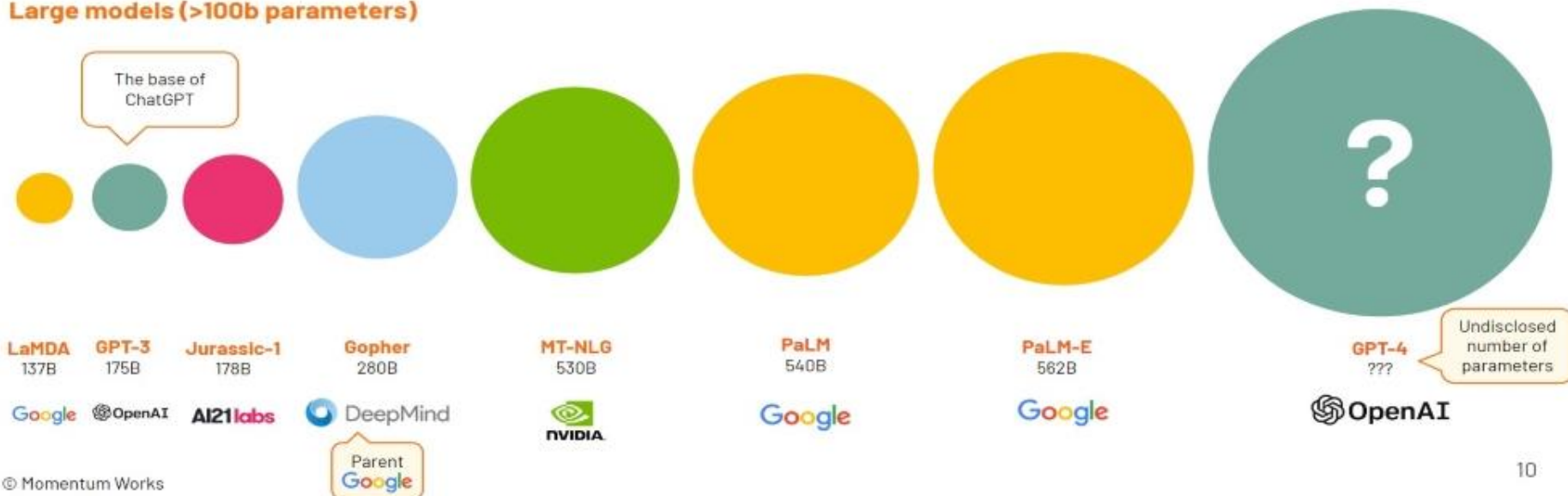
## Large Language Models are becoming very large indeed



### Small models (<= 100b parameters)



### Large models (>100b parameters)



# Industry Use Cases of ChatGPT

Enhanced Product  
Descriptions



Customer Service



Customer  
Engagement



ChatGPT

Content Creation



Research &  
Content Curation



# Principles for Generative AI Technologies

## Generative AI-Specific Principles

- **Limits and guidance on deployment and use**
- **Ownership**
- **Personal data control**
- **Correctability**

## Adapted Prior Principles

- **Transparency**
- **Auditability and contestability**
- **Limiting environmental impact**
- **Heightened security and privacy**

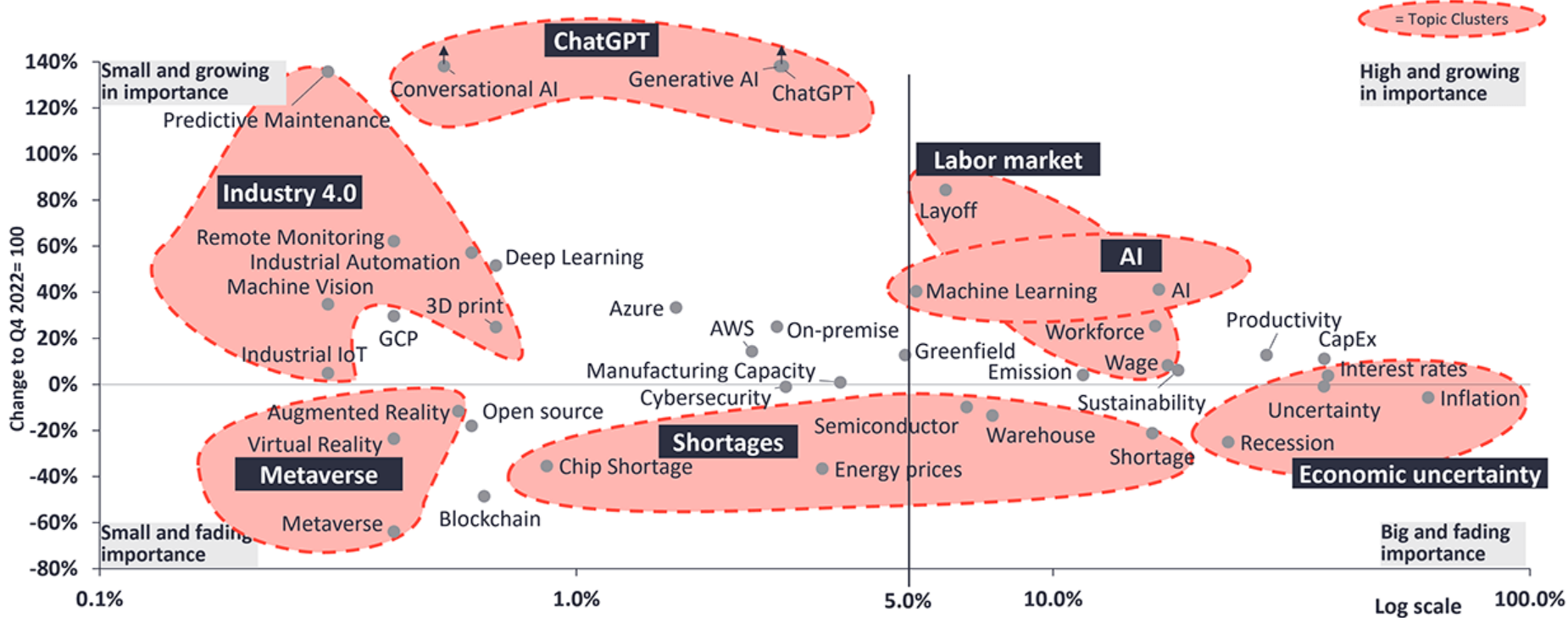
A graphic of a computer chip with the letters 'AI' in the center. The chip has a white border and a grid of pins on the top and bottom. The letters 'AI' are white with a purple glow.

AI

THE  
BUZZ...

WORLD OVER

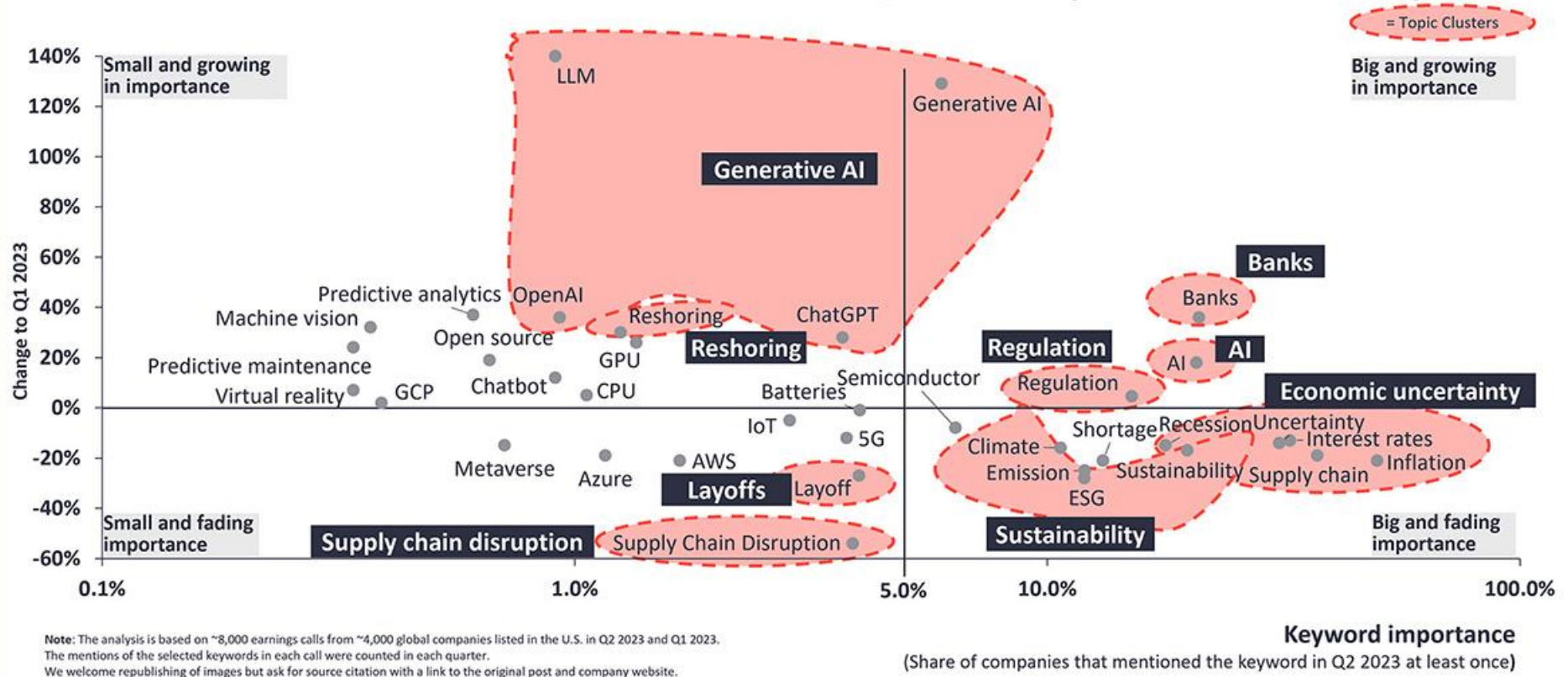
# What CEOs talked about in Q1/2023 (vs. Q4/2022)



Note: The analysis is based on ~5,800 earnings calls from ~3,000 global companies listed in the U.S. in Q1 2023 and Q4 2022. The mentions of the selected keywords in each call were counted in each quarter. We welcome republishing of images but ask for source citation with a link to the original post and company website. Source: IoT Analytics Research 2023.

**Keyword importance**  
(Share of companies that mentioned the keyword in Q1 2023 at least once)

# What CEOs talked about in Q2/2023 (vs. Q1/2023)



By 2020

By 2025

By 2030

## Geopolitical

Maintain competitiveness with other major powers and optimise its AI development environment

Have achieved a major breakthrough in basic AI theory and to be world-leading in certain applications

Establish China as the world's innovation centre for AI by 2030

## Fiscal

AI industry worth more than 150 billion yuan

Increase the worth of its core AI industry to over 400 billion yuan

Growth in the core AI industry is expected to double again and be valued at 1 trillion yuan

## Legal and ethical

Establish initial ethical norms, policies and regulations for key areas of AI

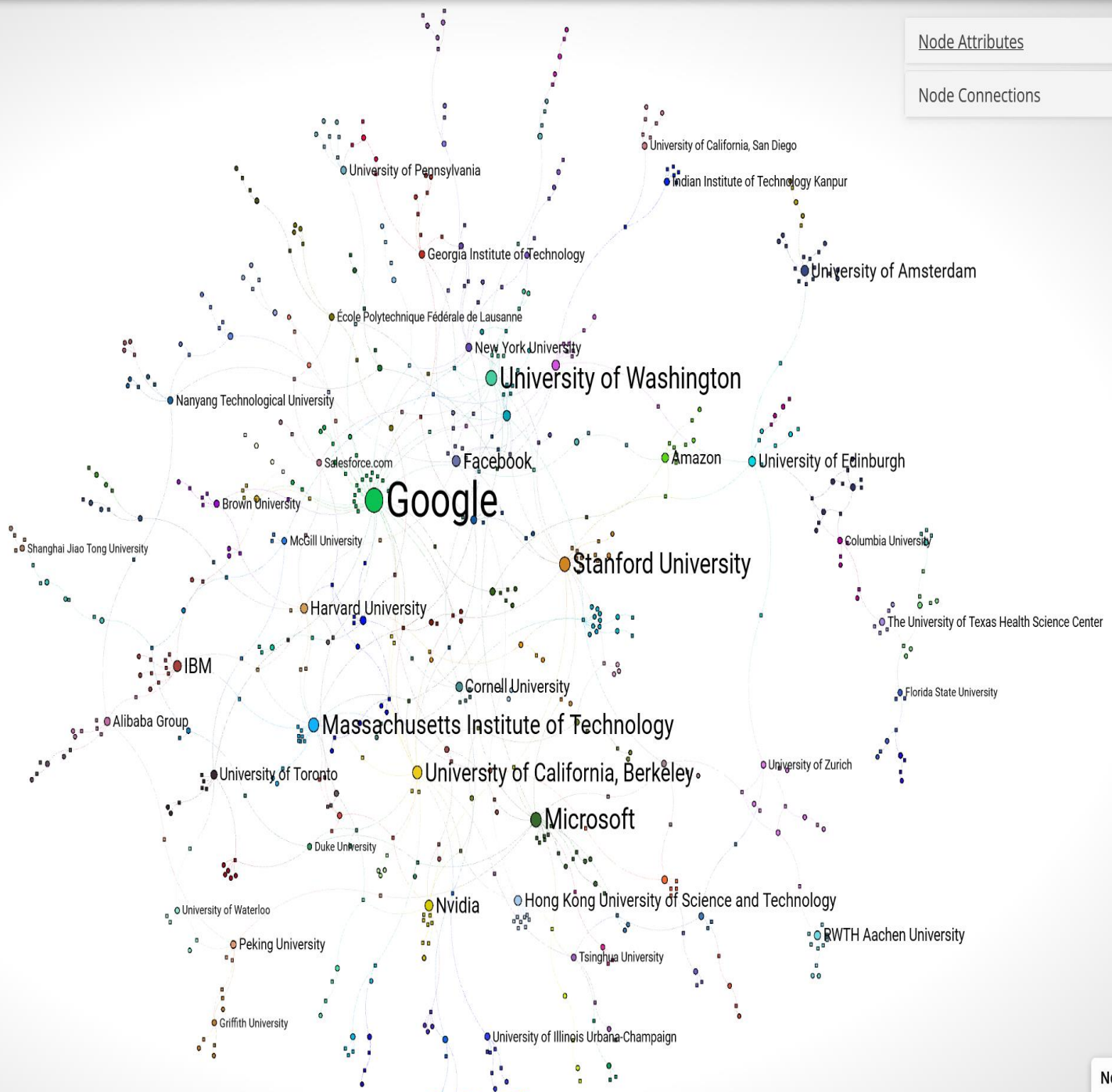
Expand upon, and codify in law, ethical standards for AI

Further upgrades in the laws and standards to be expected, to deal with newly emerging challenges

Source: Key points used in preparing this figure are from Huw Roberts et al., "The Chinese Approach to Artificial Intelligence: An Analysis of Policy and Regulation," Social Science Research Network, September 1, 2019, 4, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3469784](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3469784).



Node Attributes  
Node Connections



● Institution  
■ Publication  
↔ Co-appearance

Network Statistics  
Nodes: 699

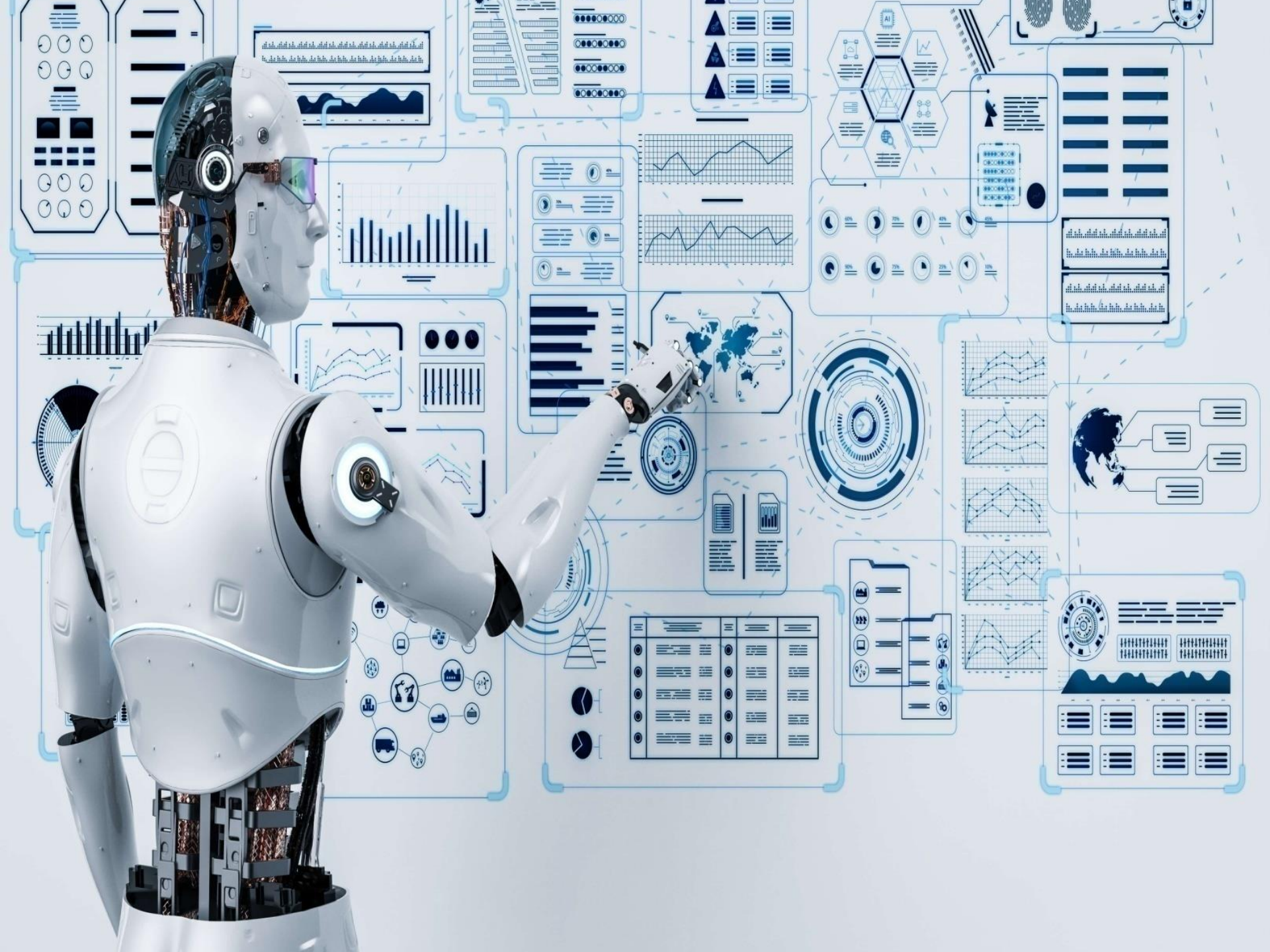
# THE INTERNET IN 2023 EVERY MINUTE

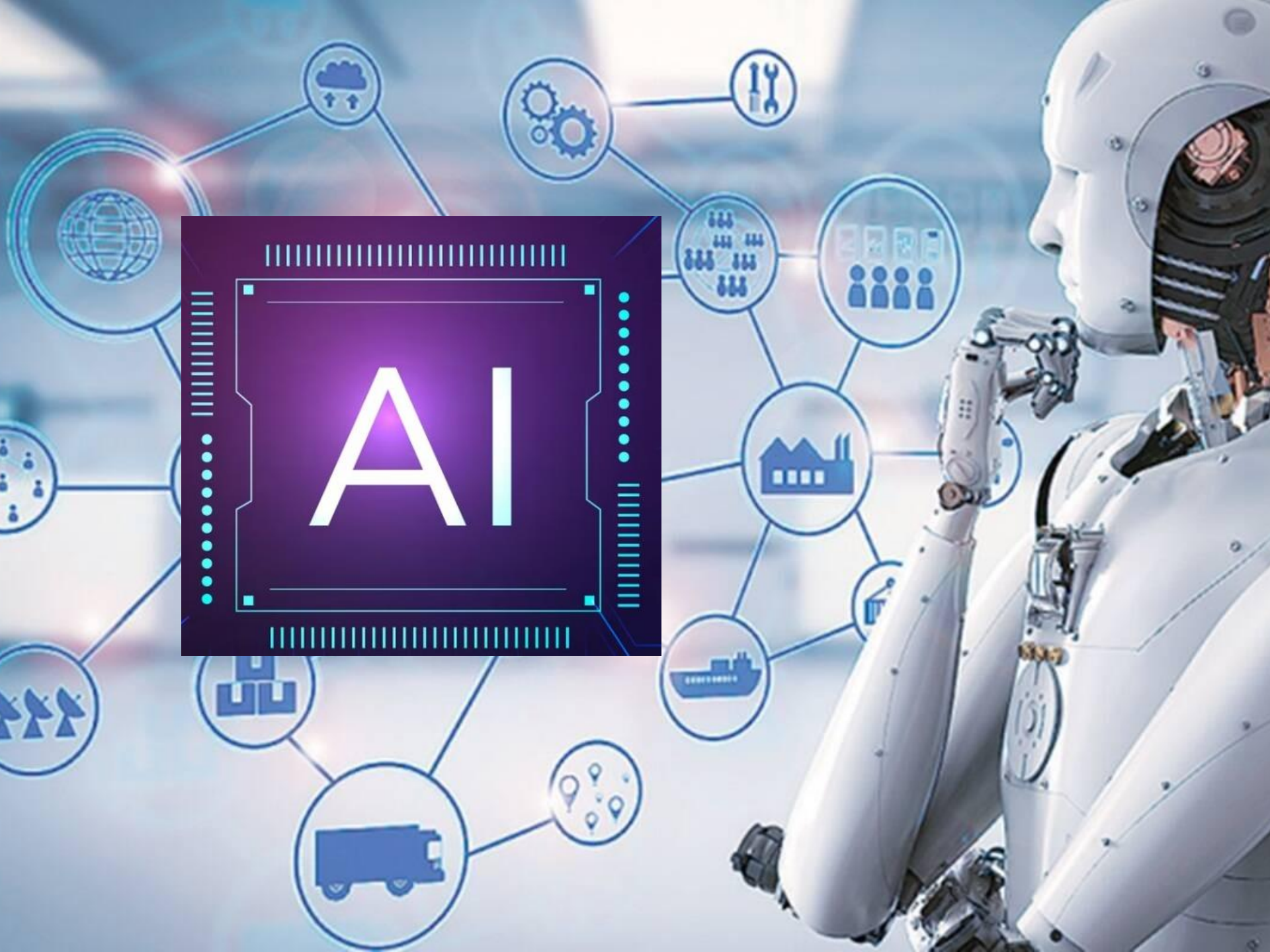


# The Future Of A.I.

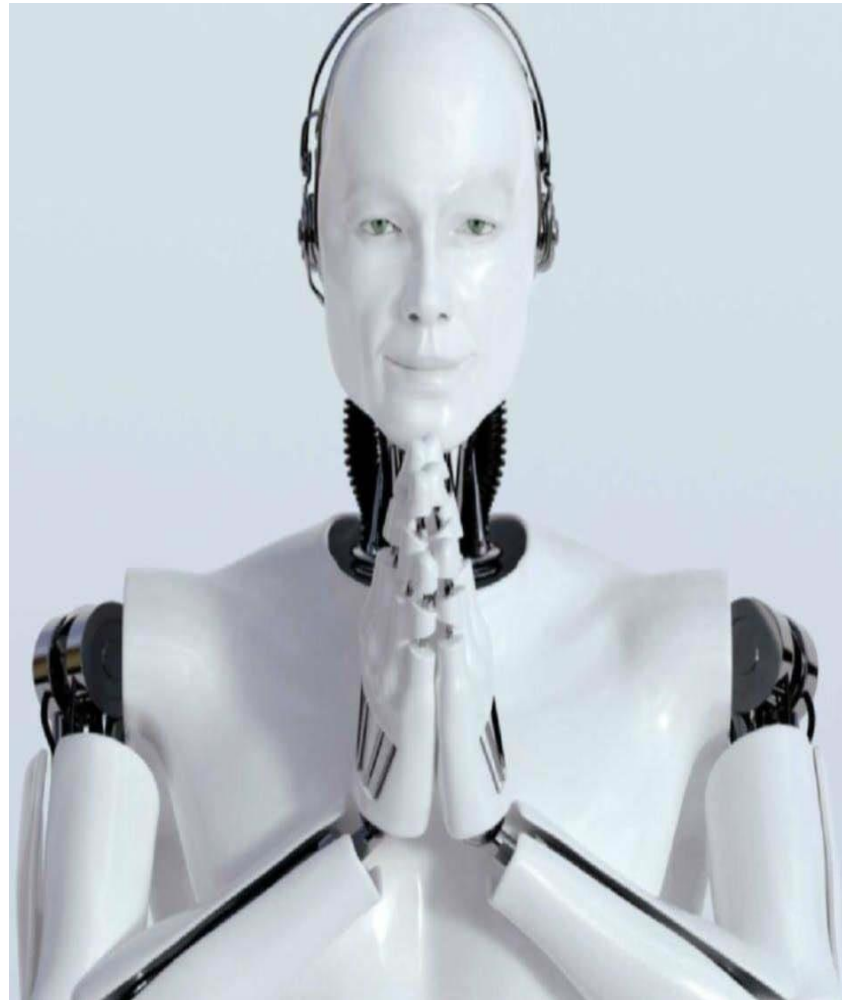
Forecasted cumulative global artificial intelligence revenue 2016-2025, by use case (U.S. dollars)







AI



**COL SURENDER KUMAR ROHILLA**



**COL SURENDER KUMAR ROHILLA**









**THANK YOU**