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AI STRATEGY

May 2024

ARTIFICIAL INTELLIGENCE

- Introduction to Artificial Intelligence
- The impacts
- Our strategy & action plan: seizing the opportunities that AI offers
- Governance & risk management

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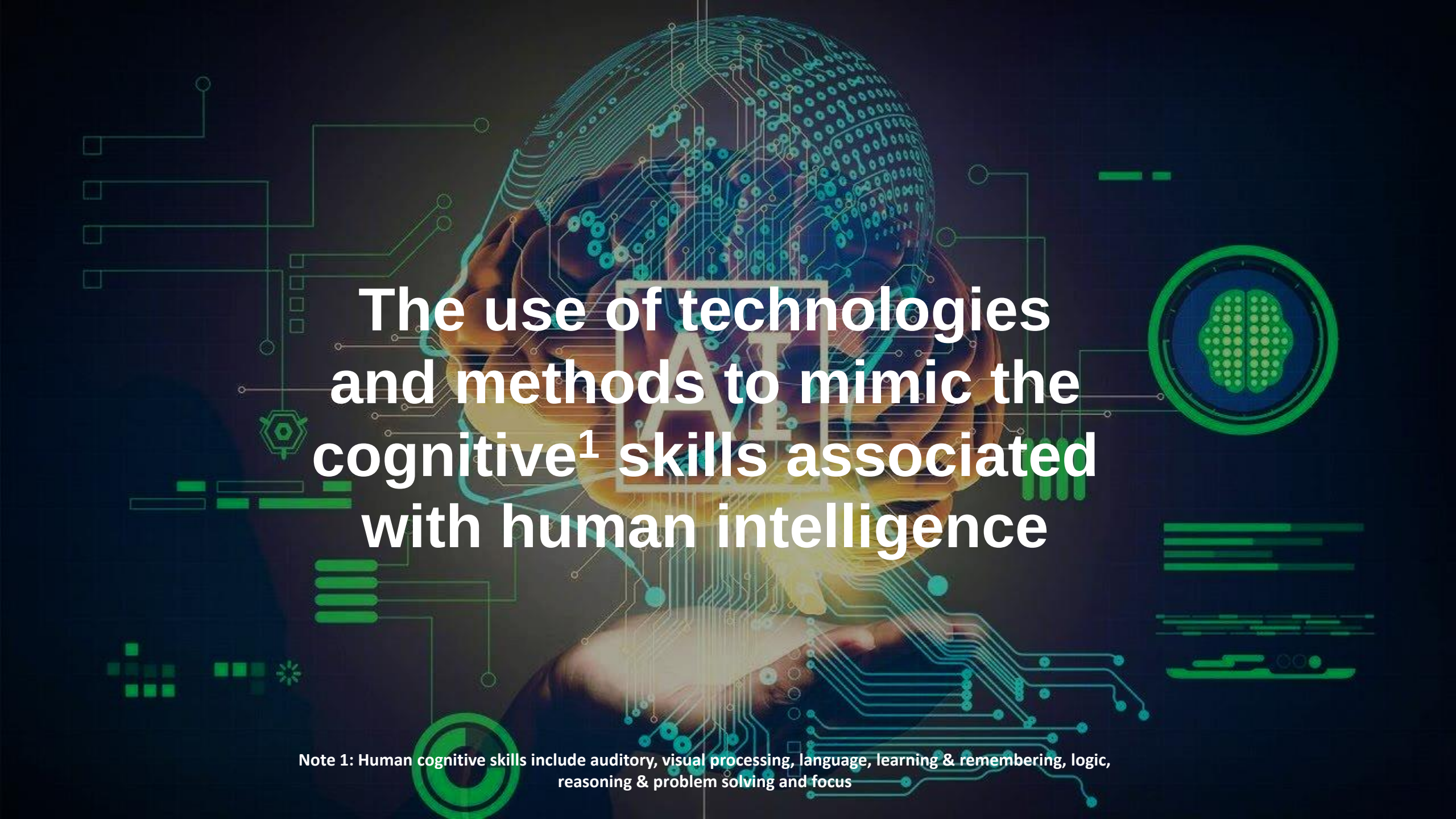
INTRODUCTION TO ARTIFICIAL INTELLIGENCE



The use of technologies and methods to mimic the cognitive[1] skills associated with human intelligence

Note 1: Human cognitive skills include auditory, visual processing, language, learning & remembering, logic, reasoning & problem solving and focus

There are six AI specialities

Automation

The use of technology to simplify and perform previously manual, repetitive tasks with the aim of eliminating human intervention, increasing the speed and quality of the outcomes

Computer vision & hearing

Allows computers to derive information and attributes from images, sound, videos and other inputs which is then fed into other applications to be processed

Generative AI

This is one of the most talked about and exciting developments in AI. It is used to create new, original content such as text, images, audio and videos

Machine Learning

Imitating the way that humans learn with the aim to improve the overall accuracy of any AI derived outcomes

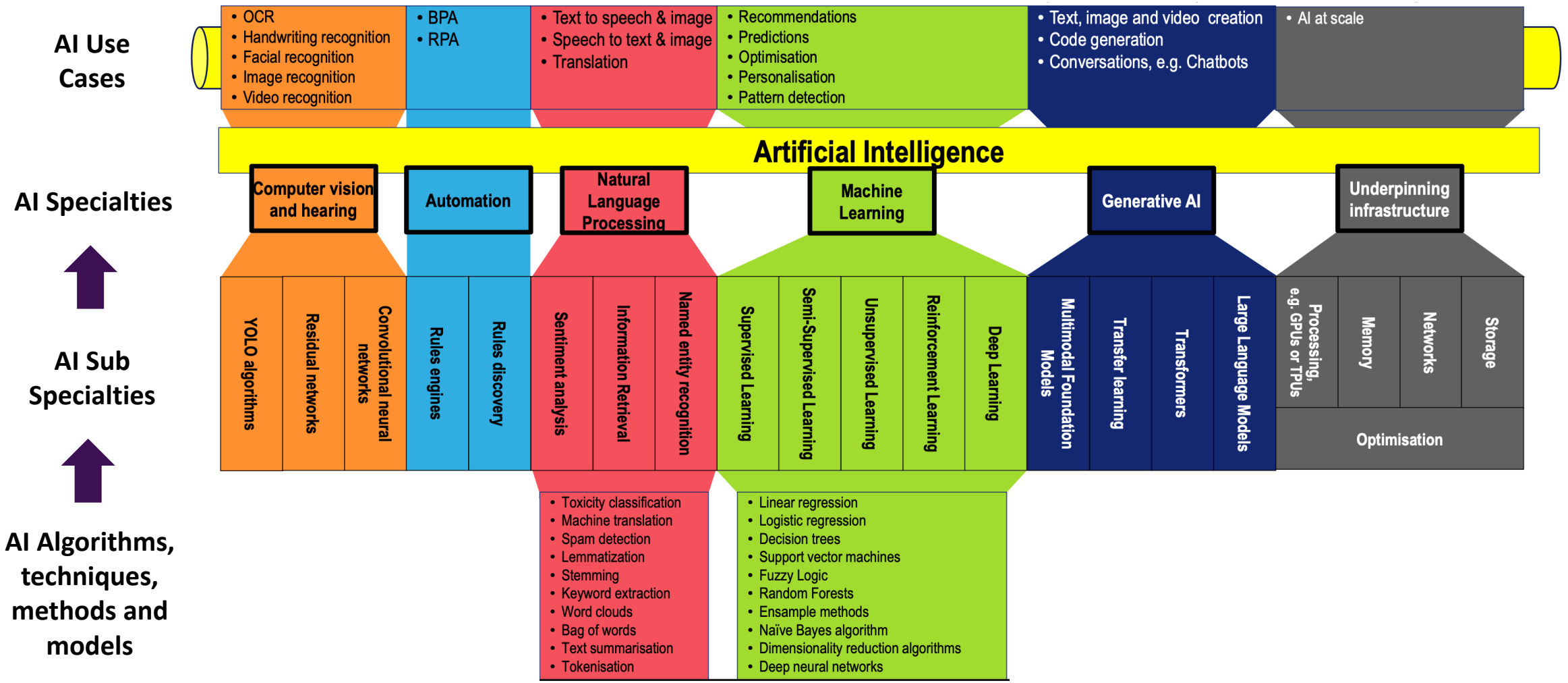
Natural Language Processing

Allows the computer to learn, understand and create human language in written or spoken form

Underpinning AI infrastructure

The high-performance computer, networks, storage and other infrastructure required to power AI, alongside the software and data models

AI use cases leverage one or more of these specialties



Measuring AI's Cognitive capabilities in two ways …

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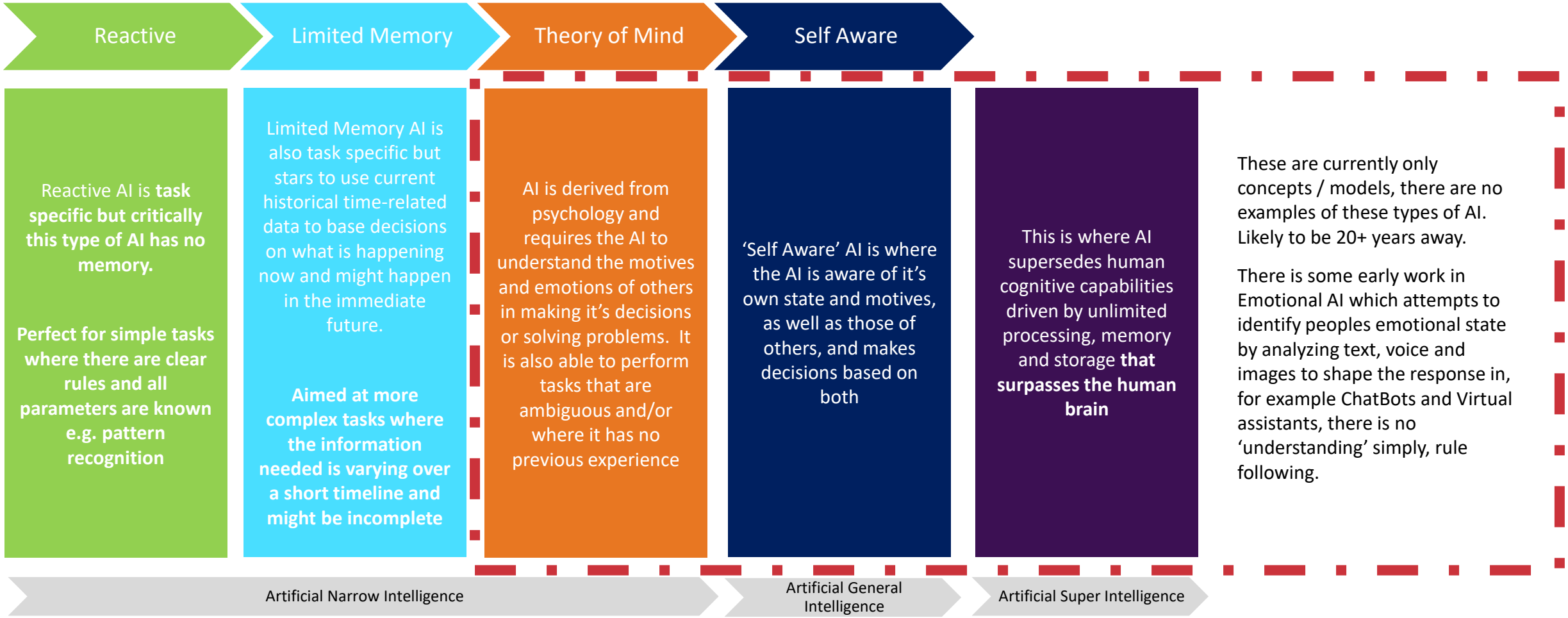
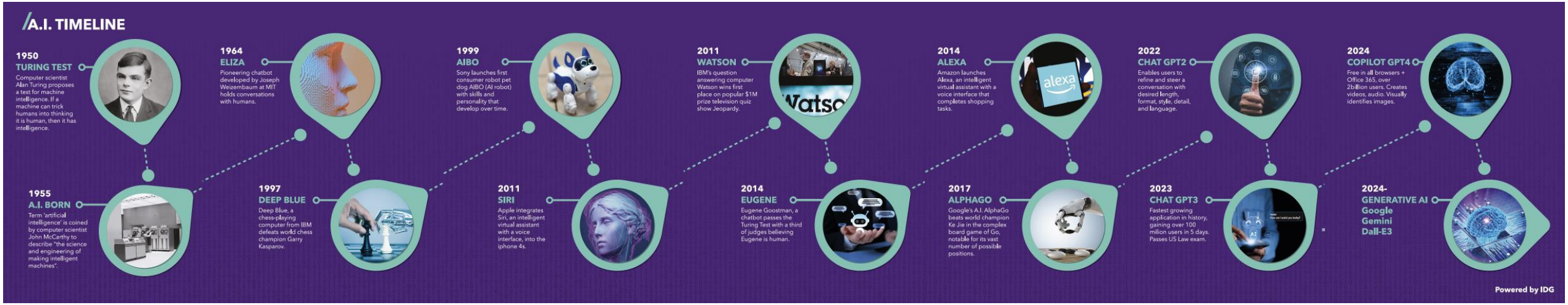
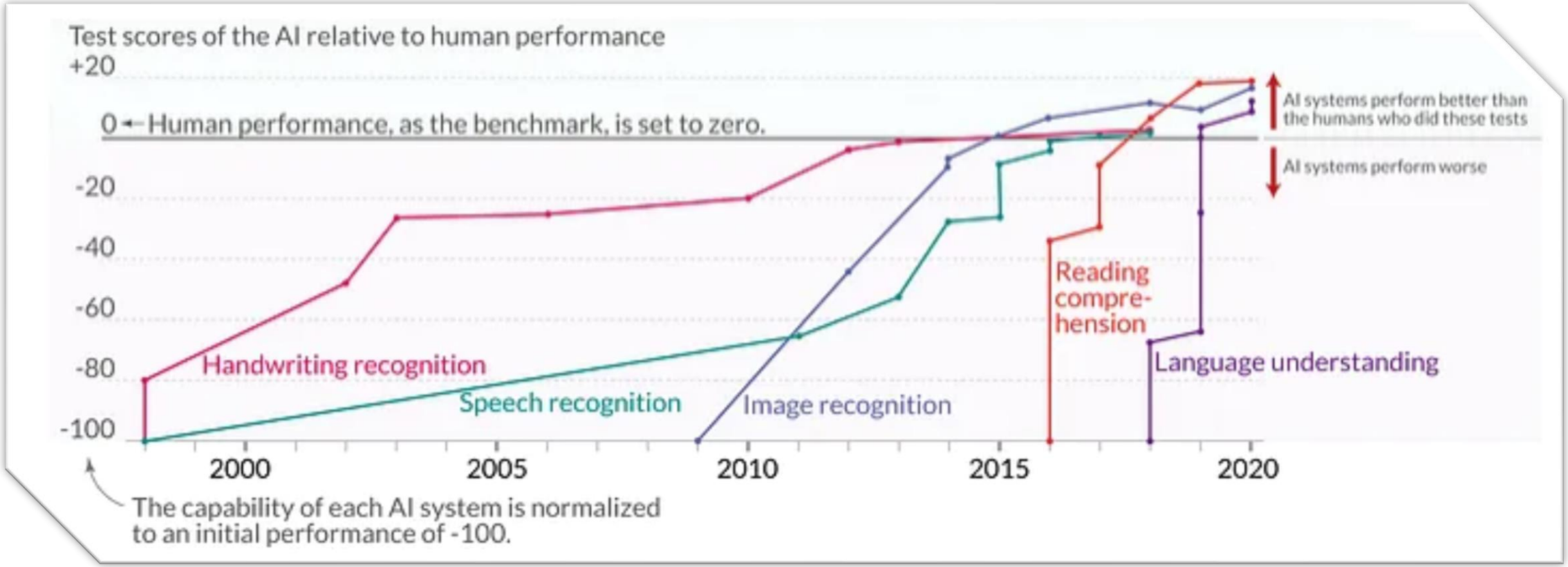


AI started 69 years ago …
… and is becoming increasingly capable



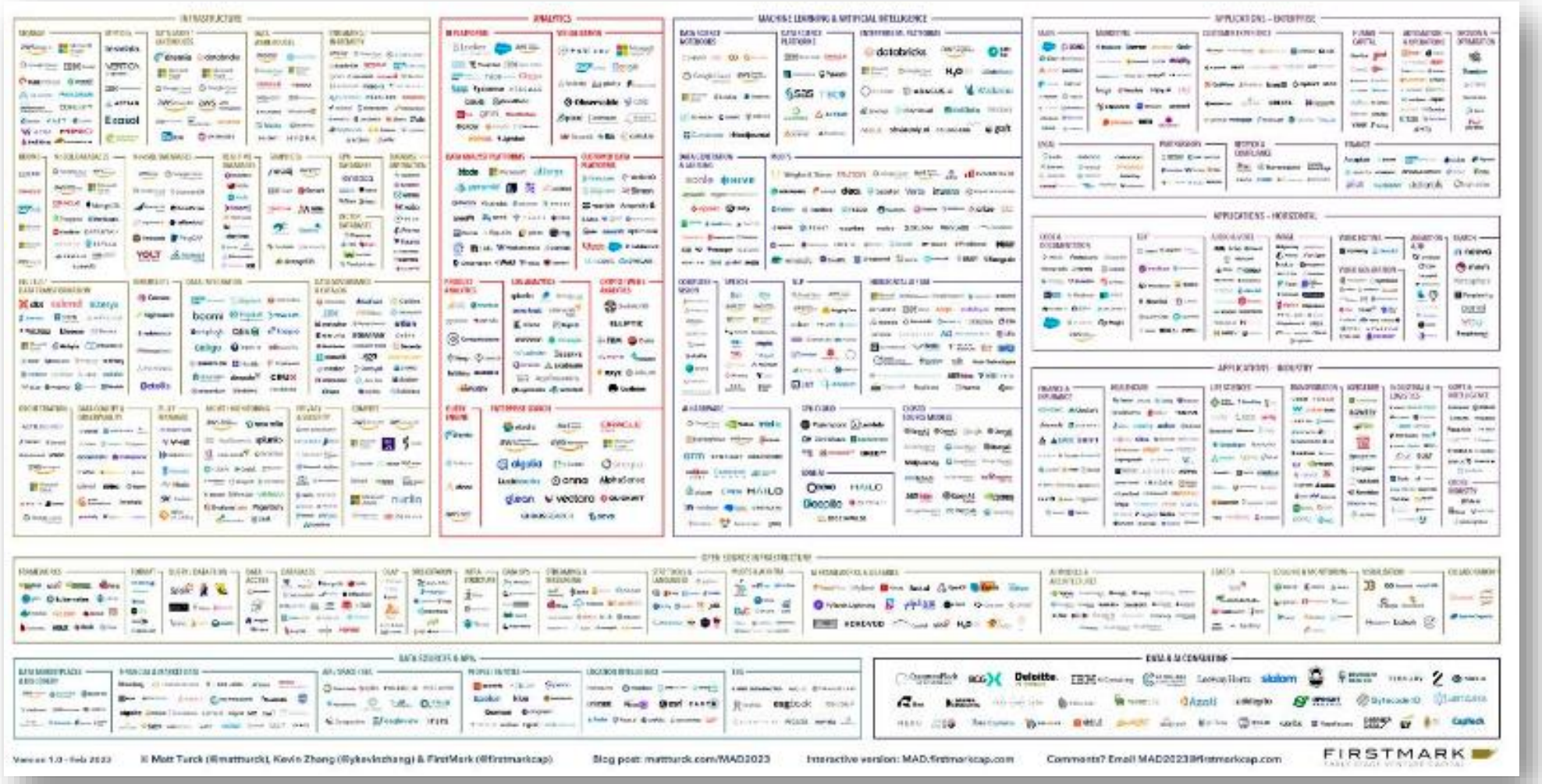
Capabilities are accelerating …



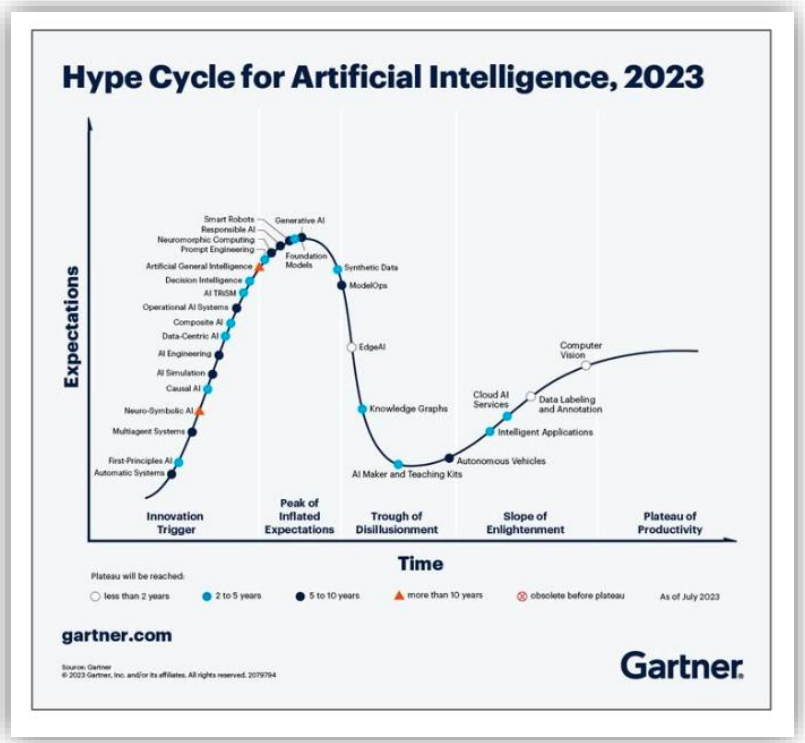
… With exponential growth in the last 10 years

Growth is driven by a large ecosystem of companies …

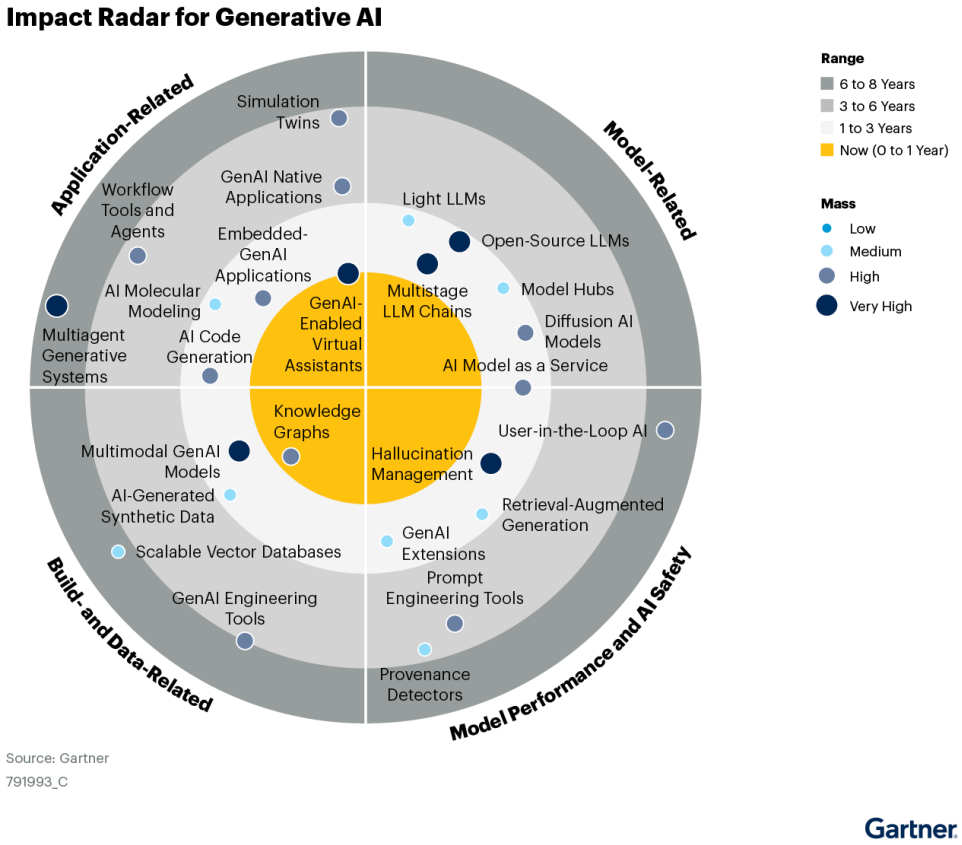
A view of the vendor landscape by area shows the sheer number of vendors with potential for **partnership** …



… and there is a lot of hype about AI



- AI is still in the innovation trigger stage
- There are high expectations on what value AI can deliver
- New AI possibilities is self sustaining, not requiring huge cash investments



Source: Gartner
791993_C

Gartner

- Right now, Gen AI assistant is real and beats humans (e.g. Google's Gemini)
- Microsoft's Copilot (multimodal AI) keeps safe your local data, augmenting it with the wider Internet information
- Hallucination needs to be managed out to build trust

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AND SOME FEAR …

In spite of the hype and fear, AI is being adopted

Energy, Oil & Gas

- Power grid optimisation
- Predict energy demands
- Development of new energy sources and refine existing ones
- Drilling optimization
- Exploration insights
- Geospatial analysis
- Safety & risk mgt.

Manufacturing

- Energy management
- Inventory management
- Manufacturing processes
- Product development
- Product simulation inc. digital twins
- Robotic manufacture
- Supply chain optimisation

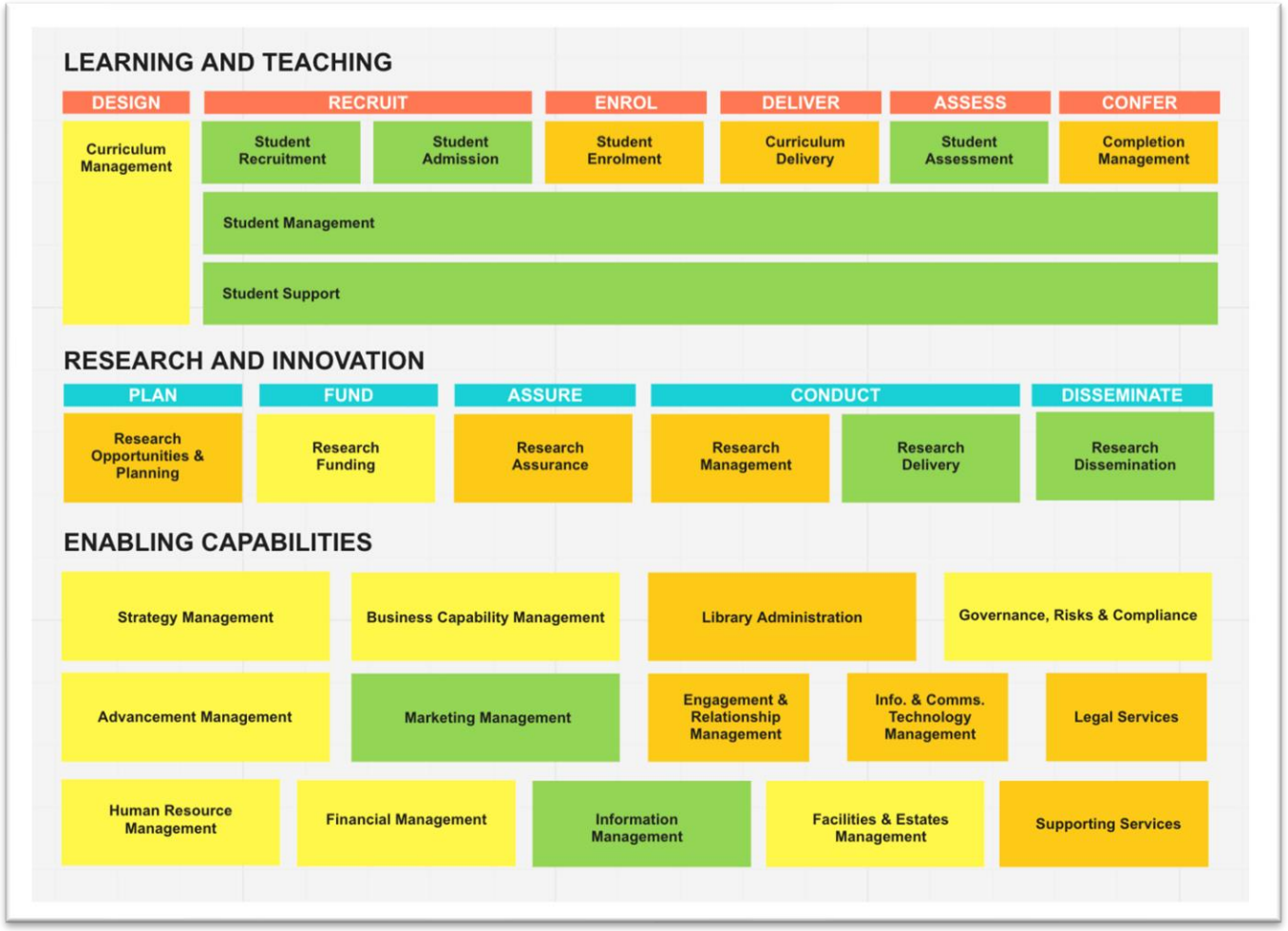
Healthcare

- Drug & medica research
  - Drug discovery & development
  - Identifying patterns in medical data
  - Personalised medicine
- Patient Care
  - Disease diagnosis
  - Insights for better diagnosis treatment
  - Medical image analysis

Retail

- Customer insights
- Customer segmentation
- Content generation
- Demand forecasting
- Marketing
- Personalisation inc. targeted marketing
- Supply chain optimisation & virtual shopping

What about higher education …



AI Potential – HIGH, MEDIUM, LOW

- Universities in Singapore are using AI to assess admission. applications
- A UK university are using AI to support peer-to-peer research reviews
- Another to provide knowledge as a service, drawing on their library & research assets
- AI driven one-on-one tutoring and real-time guidance for university students in Canada and Germany
- RG universities are automating back-office processes using the low-code MS PowerPlatform/PowerAutomate
- Florida provides every student the opportunity to learn about AI
- Arizona have recently formed a partnership with OpenAI
- Some are exploiting Gen-AI for query services
- We also believe that pedagogy, curriculum and assessment changes will emerge in response to AI
- **Plagiarism detection services are trying but struggling to respond to Chat GPT and other Gen-AI services**

Whilst some activity is bottom up, we're starting to see some top-down activity led by UK University boards … however no cohesive vision, strategy, partnership considerations … yet

What are we doing in Warwick …

Level 1 Experiment

- WIHEA learning circle
- WIHEA AI sub-group
- EP&Q – AI detection
- SU – AI summit lunch
- WBS academy – pedagogy
- Gillmore Fintech research
- WBS AI Innovation network
- Academic Development Centre – anthology
- UCISA – GPT creators
- Warwick Quantum (WMG, Maths, Chemistry, Physics, DCS)

Level 2 Maturing

- DCS – AI courses
- DCS – deep learning for imaging data
- DCS – dementia diagnosis
- DCS – built environment sustainability
- DCS – Turing Institute collaboration
- DCS – JLR discussions
- WMS – Intnl (INFAIME)
- WMS – robotics in social care
- Community of practice – ethics
- Feuer International Scholarship in AI

Level 3 Advanced

- Physics – various machine learning
- Physics – neural networks

Level 4 "way of working"

- Chat GPT / Copilot

What are the consistent areas of benefits for adopters of AI

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Generic

Improving business efficiency

Better decisions

Enhancing ‘customer’ experience

Better collaboration

Sharing knowledge

Increased revenue

Higher Education

Time saved on student & staff admin

Data driven decisions based on engagement

Easier collaboration in teaching & research

Faster & deeper scholarship

Costs, especially waste, saved to reinvest in the University

These are just a few of the key outcomes that AI will typically deliver. In **reality there are an unlimited number of opportunities** to exploit AI to benefit our students (customers), academics, research and PSG staff

There are risks with AI

… and they need to be actively managed

1) Risks around the outputs generated

- Auditability and repeatability
- Bias and fairness
- Copyright and plagiarism
- Disclosure and data loss
- Over reliance and accuracy
- Ownership
- Privacy
- Transparency

2) Broader concerns around the use of AI

- Change
- Employment
- Ethical
- Fear
- Regulations
- Reputational
- Safety
- Social

3) Misuse of AI

- Cybertheft, blackmail and fraud
- Rogue AI
- Trojan AI

4) Risk of not exploiting AI

- Uncompetitive

Do the opportunities outweigh the risks & threats?

Predicting the future is hard … but some things are certain

1) AI (esp. Gen AI) **will continue to develop**
2) AI will **become more user friendly** and easier to use
3) AI will be **deployed on more use cases & more complex issues**
4) AI **will drive increasing levels of personalization** and will seamlessly integrate into our ways of working
5) There will be **more emphasis on regulations and ethics**
6) There will be **increasing concerns about impact on jobs & roles**
7) Organisations **adopting AI at scale will outperform those** that don't
8) There will be an **increasing demand for AI skills**
9) There will be an **increase use of AI to attack organisations**

… so **we need a strategy and an action plan** to maximise the opportunities and to minimise the risks …

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OUR STRATEGY & ACTION PLAN

OUR VISION

Transforming Excellence with Warwick.AI

‘Our vision is to **integrate artificial intelligence seamlessly** into **teaching, research, and administration**. We aim to **personalise education**, **accelerate research**, **optimise administration**, and **foster innovation**. Grounded in ethics and inclusivity, we empower our community with cutting-edge AI technologies, preparing for the future's challenges and opportunities’

To bring our vision to life, we will …

- Provide Strong leadership and support around AI
- Communicate and champion the AI vision & five goals
- Upskill our people via the ‘digital academy’ on common language and application of AI
- Govern AI in a responsible, ethical way

WE HAVE FIVE GOALS FOR AI

Personalising Education:

1. Implement AI-driven personalised learning experiences for students, tailoring educational content and delivery methods to individual learning styles and preferences.
2. Develop intelligent tutoring systems that provide targeted support and feedback to enhance student understanding and performance

Accelerating Research:

1. Utilise AI to streamline and accelerate research processes, from data analysis and interpretation to literature reviews and hypothesis generation.
2. Implement natural language processing (NLP) tools to assist researchers in extracting valuable insights from vast amounts of academic literature and documents

Optimising Administration:

1. Integrate AI solutions to automate routine administrative tasks, such as admissions processing, course scheduling, and resource allocation.
2. Utilise predictive analytics to forecast enrolment trends, optimize resource utilization, and enhance decision-making in administrative functions

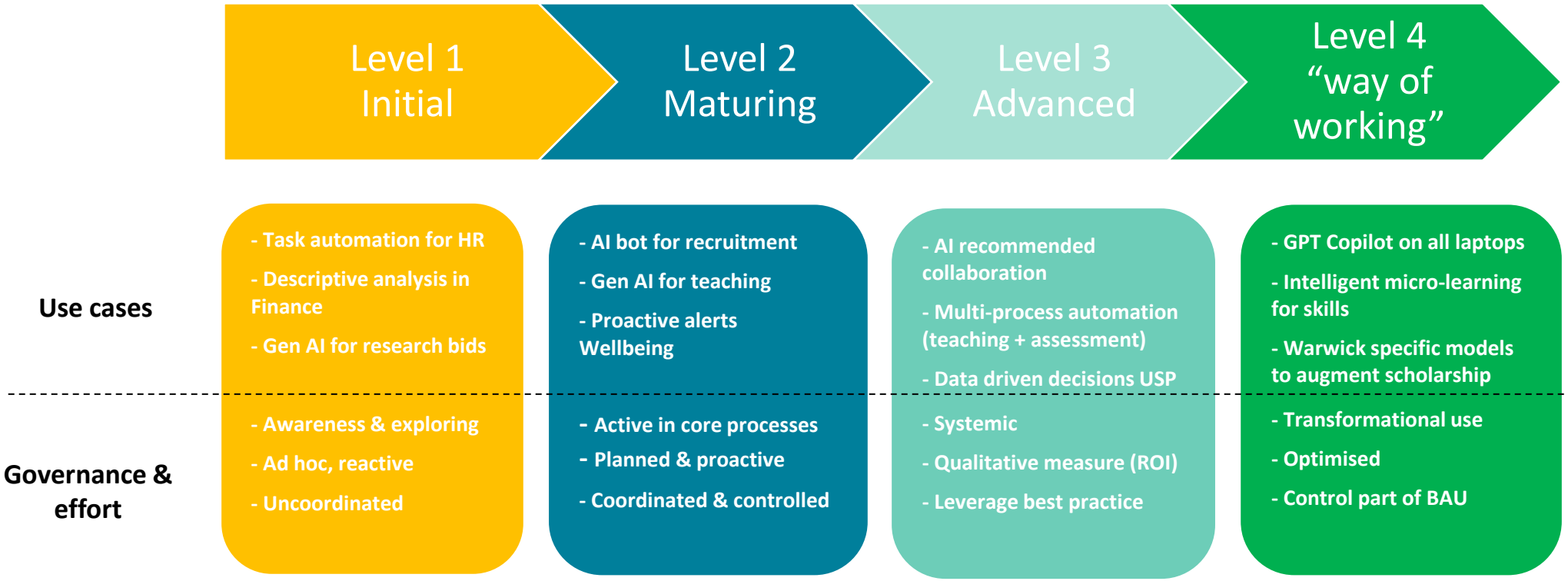
Fostering Innovation:

1. Encourage the development and implementation of AI-based solutions to address educational and research challenges creatively.
2. Establish collaborative spaces and programs that bring together faculty, students, and industry partners to explore innovative applications of AI in various academic disciplines

Ethics and Inclusivity:

1. Prioritise ethical considerations in the development and deployment of AI technologies within the university ecosystem.
2. Ensure inclusivity by addressing potential biases in AI algorithms and promoting diversity in AI research and development.
3. Establish guidelines and frameworks for responsible AI use, fostering a culture of transparency and accountability in AI applications across teaching, research, and administration.

Maximising the use of AI inside our institution



Accelerating our strategy

AI COE

In parallel to establishing our new AI governance structure we will create an AI Centre of Excellence to further accelerate the development of standards and processes, and the sharing of best practice.

Working with stakeholders across the University, the AI CoE will be tasked with:

- Helping to coordinate AI activities across the UoW
- Acting as focal point for AI advice and guidance
- Sharing best practice inc. sharing lessons learnt
- Developing AI expertise across the institution
- Drive the AI maturity levels
- Guiding AI innovation & research
- Identifying institutional-driven use cases
- Developing solutions architectures – for for AI & Data
- Helping to execute AI initiatives and ensuring benefits and realized
- Sharing successes

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GOVERNANCE & RISK MANAGEMENT

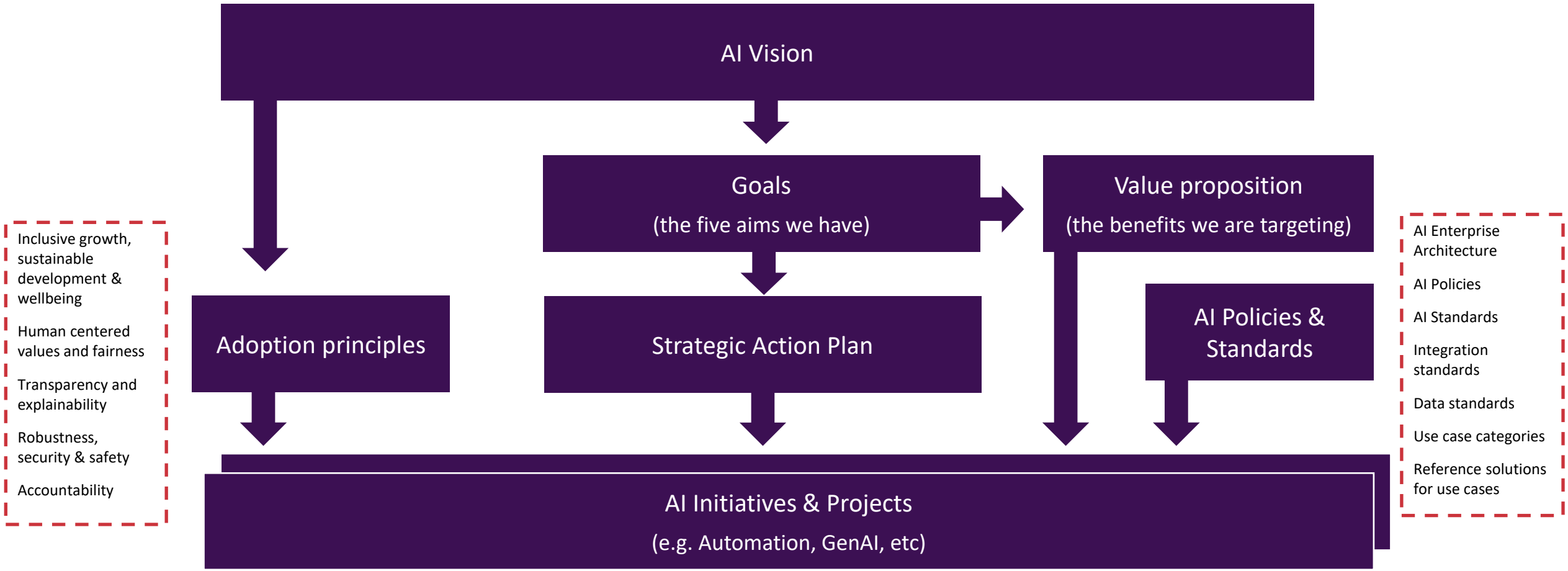
Responsible AI
A new governance framework

Whilst we may not be developing AI algorithms we are still exposed to the risks that adopting AI presents **so we need to ensure that we adopt AI in a responsible manner** alongside seizing the opportunities that AI can offer our students, academics, researchers and professional services teams

We will **implement a new AI governance framework** with the intention of:

1. Providing strategic direction and prioritisation
2. Ensuring alignment across our University
3. Ensuring we keep control of AI, maximising the opportunities and benefits and messaging
4. Manage the risks associated with adopting AI at scale

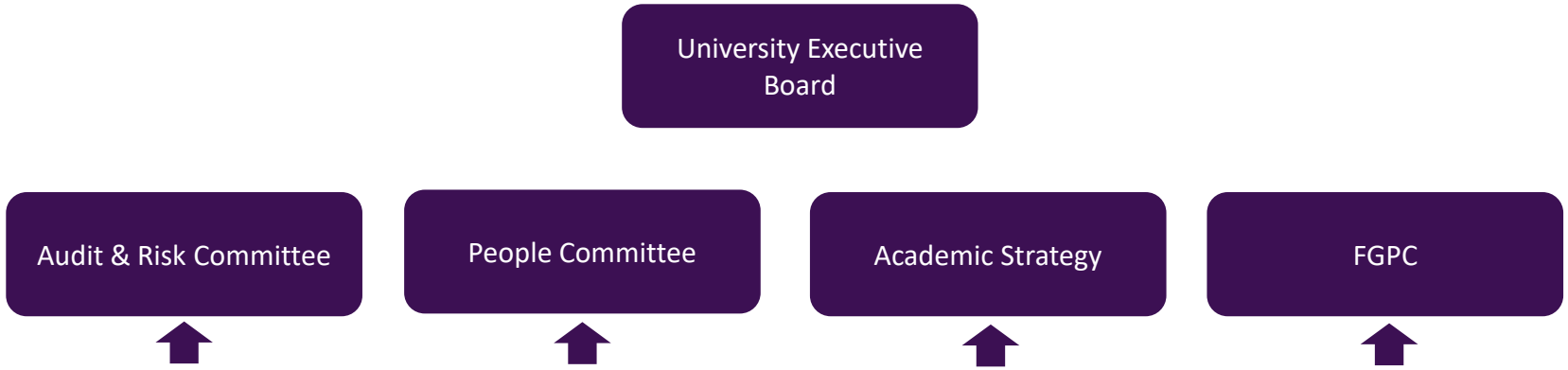
AI GOVERNANCE FRAMEWORK
Key elements of our AI governance framework



AI Adoption Principles
The OECD Recommends five principles for the adoption of AI

Principle	Rationale	Description
Inclusive growth, sustainable development & well-being	This Principle highlights the potential for trustworthy AI to contribute to overall growth and prosperity for all – individuals, society and planet and advance global development objectives.	Stakeholders should proactively engage in responsible stewardship of trustworthy AI in pursuit of beneficial outcomes for people and the planet such as augmenting human capabilities and enhancing creativity, advancing inclusion of underrepresented populations, reducing economic social gender and other inequalities, and protecting natural environments, thus invigorating growth, sustainable, development and well-being
Human centered values and fairness	AI system should be designed in a way that respects the rule of law, human rights, democratic values and diversity and should include appropriate safeguards to ensure a fair and just society	AI actors should respect the rule of law, human rights and democratic values, throughout the AI system lifecycle. These include freedom, dignity and autonomy, piracy and data protection, non-discrimination and equality, diversity, fairness, social justice, and internationally recognized labour rights. To this end, AI actions should implement mechanisms and safeguards, such as capacity for human determination, that are appropriate to the context and consistent with the state of art.
Transparency and explainability	The principle is about transparency and responsible disclosure around AI systems to ensure that people understand when they are engaging with them and can challenge outcomes	AI actors should commit to transparency and responsible disclosure regarding AI systems. To this end, they should provide meaningful information, appropriate to the context, and the consistent with the state of art. - to foster a general understanding of AI systems - to make stakeholders aware of their interactions with AI systems, including in the workplace - to enable those affected by an AI system to understand the outcome, and - to enable those adversely affected by an AI system to challenge it's outcome based on their plan and easy-to-understand information on the factors, and the logic, that served as the basis for the prediction. Recommendation or decision
Robustness, security and safety	AI systems must function in a robust, secure and safe way throughout their lifetimes, and potential risks should be continually assessed and managed	AI systems should be robust, secure and safe throughout their entire lifecycle so that in conditions of normal use, foreseeable use of misuse, or other adverse conditions, they function appropriately and do not pose unreasonable safety risk. To this end, AI actions should ensure traceability, including in relation to datasets, processes and decisions made during the AI system lifecycle, to enable analysis of the AI systems outcomes and responses to inquiry, appropriate to the context and consistent with the state of art. AI actions should, based on their roles, the context and their ability to act, apply a systematic risks management approach to each phase of the AI system lifecycle on a continuous basis to address risks related to AI systems, including privacy, digital security, safety and bias.
Accountability	Organisations and individuals developing, deploying or operating AI systems should be held accountable for their proper functioning in line with the OECD's value-based principles for AI	AI actions should be accountable for proper functioning of AI systems and for the respect of the above principles, based on their roles, the context and consistent with the state of art

AI GOVERNANCE
A light touch providing direction & oversight



AI Strategy Board

Three Areas of Focus

Responsible AI

Ensuring that we adopt AI responsibly for the benefits of our students, academics, research and staff.

- Compliance
- Ethics
- Regulations

AI Policies & Standards

Ensuring that we create and implement the right AI policies and standards

- Vision

Mission & goals

Governance

Policies

Standards

AI Best Practice

Ensuring that we share best practices for adoption and acceleration of AI across UoW, our products and services

- AI research
- PSG
- Education

AI Governance
Strategy Board Membership

- **CITO (Chair)**
Dir. Strategy EA Innovation (deputy)
- Professor x3 per Faculty
e.g. DCS Till Bretschneider
- Senior Academic x3 per school
e.g. WBS Isabel Fisher
- COO per school / Director Admin
e.g. WBS COO Gareth Bennett
e.g. SEM Dir Admin Ruth Cooper

- CCSG COO Peter Hall
- SU Director Academic services
- Finance Director e.g. David Mason
- Interim CPO nominee

- CMI representative
- IDG SLT as required

-

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- Vision
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AI Best Practice

Ensuring that we share best practices for adoption and acceleration of AI across UoW, our products and services

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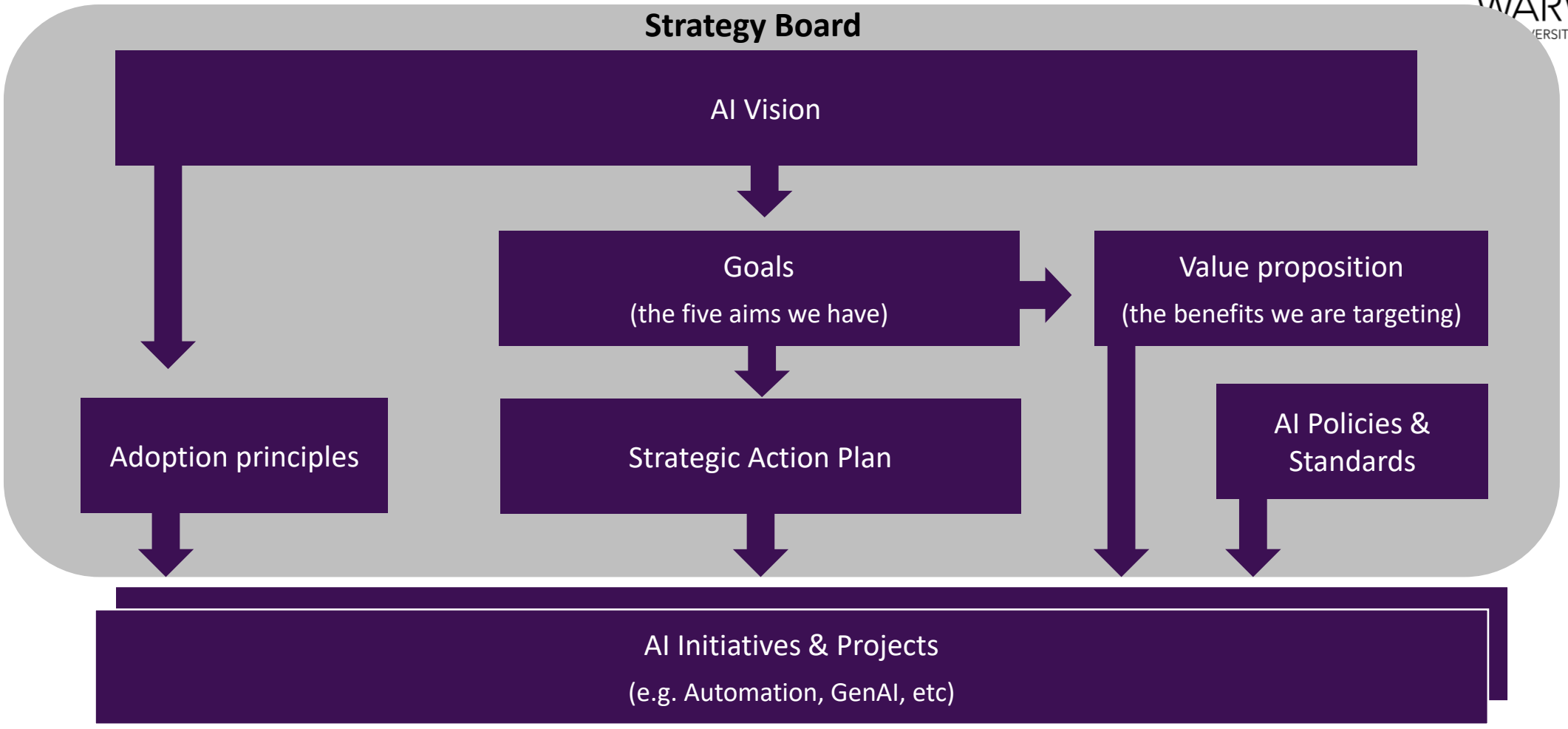
- Education

AI GOVERNANCE FRAMEWORK AND STRUCTURE MAPPED
Where the group provides direction & oversight



AI QUALIFICATION ASSESSMENT (DRAFT)
Ensuring AI is the best solution to the 'business' problem

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General AI initiatives & Maturity Questions

- What is the primary goal or objective of your AI initiative?
- Have you previously implemented any AI solutions or projects? If yes, could you provide some examples?
- What is the level of AI awareness and understanding?
- Do you have a dedicated team focused on AI and data science ?
- What is the current stage of your AI initiatives (e.g. Exploration, pilot projects full-scale deployment)?

Data Readiness & Availability

- What is the state of your data infrastructure (quality assessment of data structures, systems etc)
- What types of data are stored and in what volume?
- Do you have data ownership and governance controls?
- Is your data labelled and annotated for modelling, if applicable?

AI Use Case & Application

- What specific business problem or challenge do you aim to address with AI?
- Have you identified any specific use cases or applications for AI?
- How do you envision AI addition value ?

AI Strategy & Planning

- What is your 'business strategy' and how does AI enable / accelerate this?
- Have you allocated budget for AI initiatives and if so what is the budget range?
- What are the KPIs you will use to measure the success of the AI project?

Technical Environment

- What technology stack are your currently using / what would you like to use for AI development?
- Should cloud be considered (on-prem / cloud)

AI Talent & Skills

- What is the maturity of AI skills within your department?
- Should we leverage any of our existing digital eco-system partners?

Regulatory & Compliance Considerations

- Are there specific regulatory or compliance requirements that impact your AI project (e.g. GDPR, HIPAA)?
- What measures have you taken to ensure the ethical and responsible AI development and usage?

Scalability & Integration

- Do you foresee the need to scale the AI solution?
- What plans are in place to integrate AI system with existing software and processes?

User Adoption & Change Mgt.

- What strategies are in place to ensure that AI solutions are adapted and used effectively?

In summary …

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AI is innovation …
… and innovation is in our DNA