

# AI STRATEGY

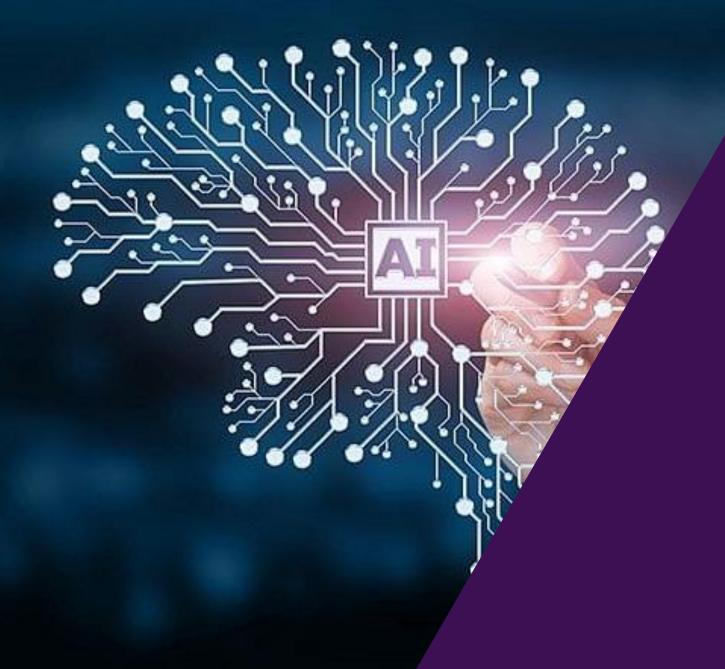


# **ARTIFICIAL INTELLIGENCE**



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



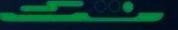


# INTRODUCTION TO ARTIFICIAL INTELLIGENCE

# The use of technologies and methods to mimic the cognitive<sup>1</sup> skills associated with human intelligence



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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**

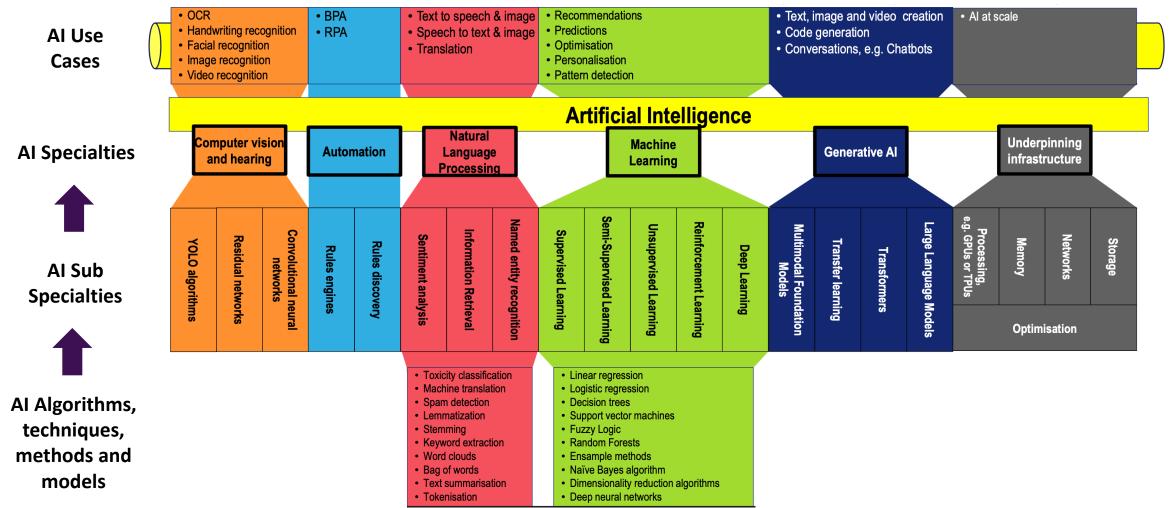
Allows the computer to learn, understand and create human language in written or spoken form

#### **Underpinning AI infrastructure**

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

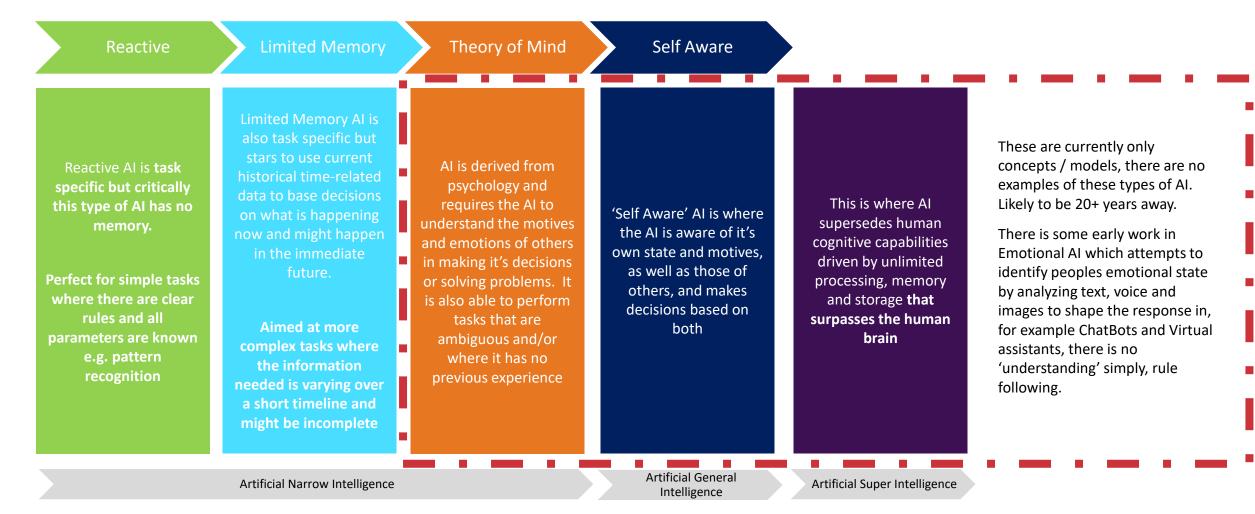
# Al use cases leverage one or more of these specialties





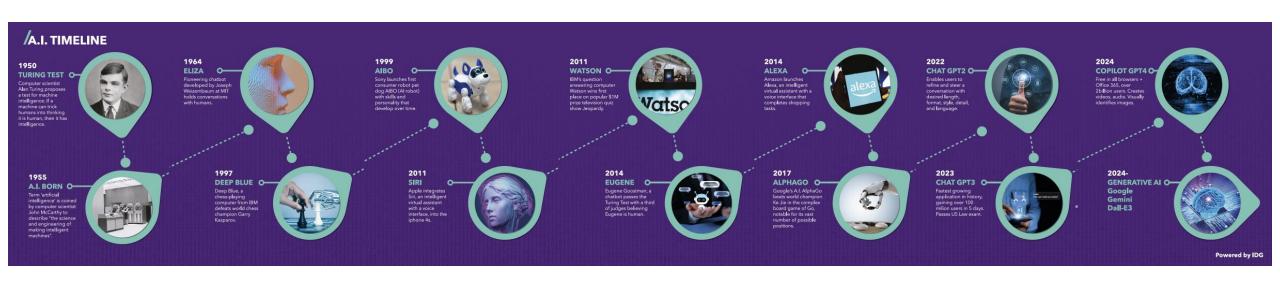
# Measuring Al's Cognitive capabilities in two ways ...





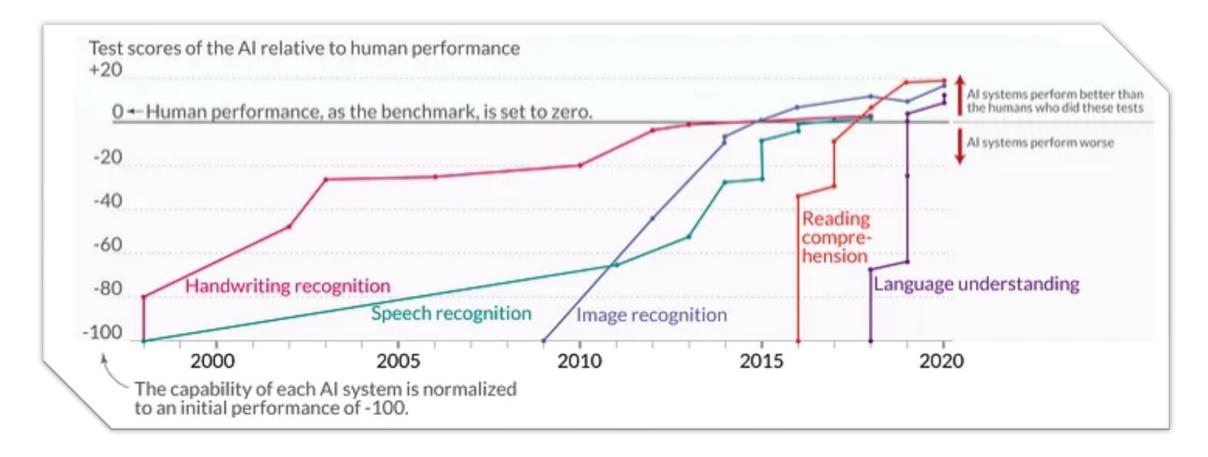
# Al started 69 years ago ... ... and is becoming increasingly capable







# **Capabilities are accelerating ...**



# ... With exponential growth in the last 10 years



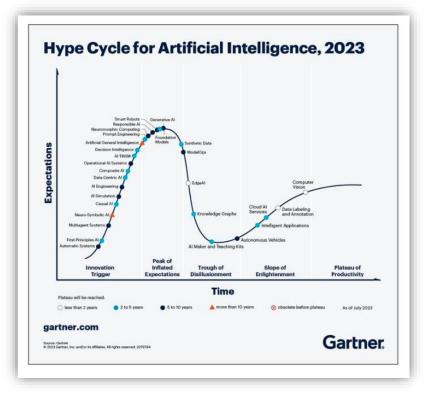
# Growth is driven by a large ecosystem of companies ...

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

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# ... and there is a lot of hype about AI

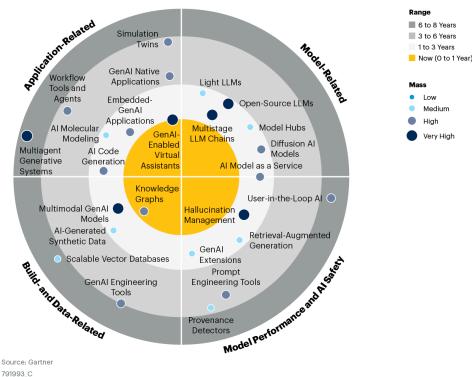




- AI is still in the innovation trigger stage

- There are high expectations on what value AI can deliver

- New AI possibilities is self sustaining, not requiring huge cash investments



Impact Radar for Generative AI

Gartner

- Right now, Gen AI assistant is real and beats humans (e.g. Google's <u>Gemini</u>)

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



# AND SOME FEAR ...

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



#### Energy, Oil & Gas

- Power grid optimisation ٠
- Predict energy demands ٠
- Development of new energy sources and refine existing ones ٠
- Drilling optimization ٠
- **Exploration** insights ٠
- Geospatial analysis ٠
- Safety & risk mgt. ٠



- 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 ٠
  - Identifying patterns in medical data ٠
  - Personalised medicine ٠
- Patient Care .
  - Disease diagnosis ٠
  - Insights for better diagnosis treatment ٠
  - Medical image analysis ٠

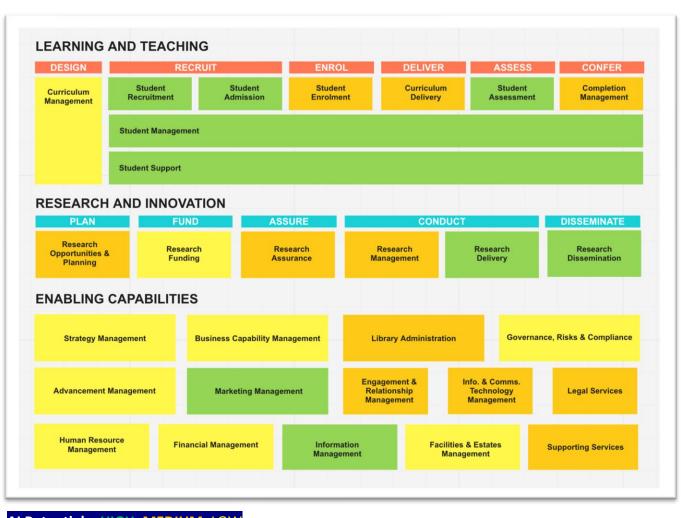


#### Retail

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



# What about higher education ...







- 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
- Al 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 ...



**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)

# $\frac{2}{9}$ Maturing

DCS – Al 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 Al 

 Advanced
 Topological

 Advanced
 Topological

 Physics – various<br/>machine learning<br/>Physics – neural<br/>networks
 Chat GPT / Copilot

### What are the consistent areas of benefits for adopters of AI



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 Al
  - Cybertheft, blackmail and fraud
  - Rogue Al
  - Trojan Al
- 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) Al 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 ...



# OUR STRATEGY & ACTION PLAN

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**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



	Level 1 Initial	Level 2 Maturing	Level 3 Advanced	Level 4 "way of working"
Use cases	<ul> <li>Task automation for HR</li> <li>Descriptive analysis in Finance</li> <li>Gen AI for research bids</li> </ul>	<ul> <li>AI bot for recruitment</li> <li>Gen AI for teaching</li> <li>Proactive alerts</li> <li>Wellbeing</li> </ul>	<ul> <li>AI recommended collaboration</li> <li>Multi-process automation (teaching + assessment)</li> <li>Data driven decisions USP</li> </ul>	<ul> <li>- GPT Copilot on all laptops</li> <li>- Intelligent micro-learning for skills</li> <li>- Warwick specific models to augment scholarship</li> </ul>
Governance & effort	- Awareness & exploring - Ad hoc, reactive - Uncoordinated	<ul> <li>Active in core processes</li> <li>Planned &amp; proactive</li> <li>Coordinated &amp; controlled</li> </ul>	- Systemic - Qualitative measure (ROI) - Leverage best practice	- Transformational use - Optimised - Control part of BAU

# 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 Al 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

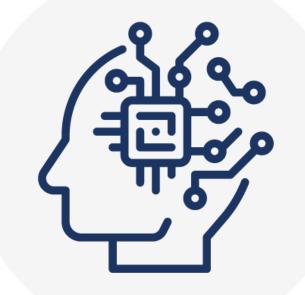
# **Responsible AI A new governance framework**

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:

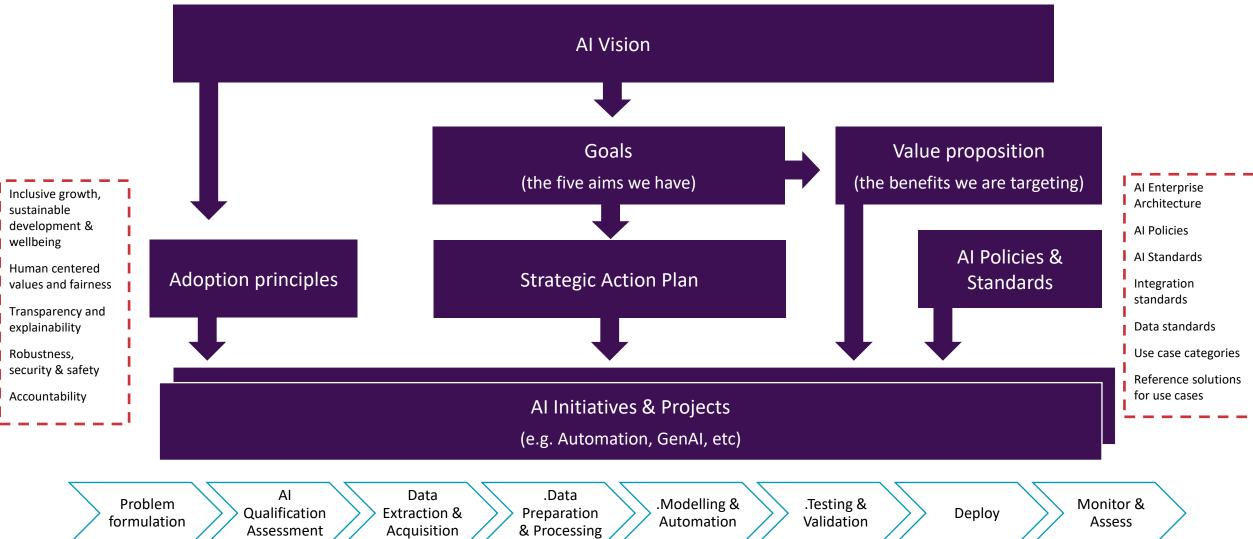
- 1. Providing strategic direction and prioritisation
- 2. Ensuring alignment across our University
- 3. Ensuring we keep control of AI, maximising the opportunities and benefits and messaging
- 4. Manage the risks associated with adopting AI at scale





# AI GOVERNANCE FRAMEWORK Key elements of our AI governance framework





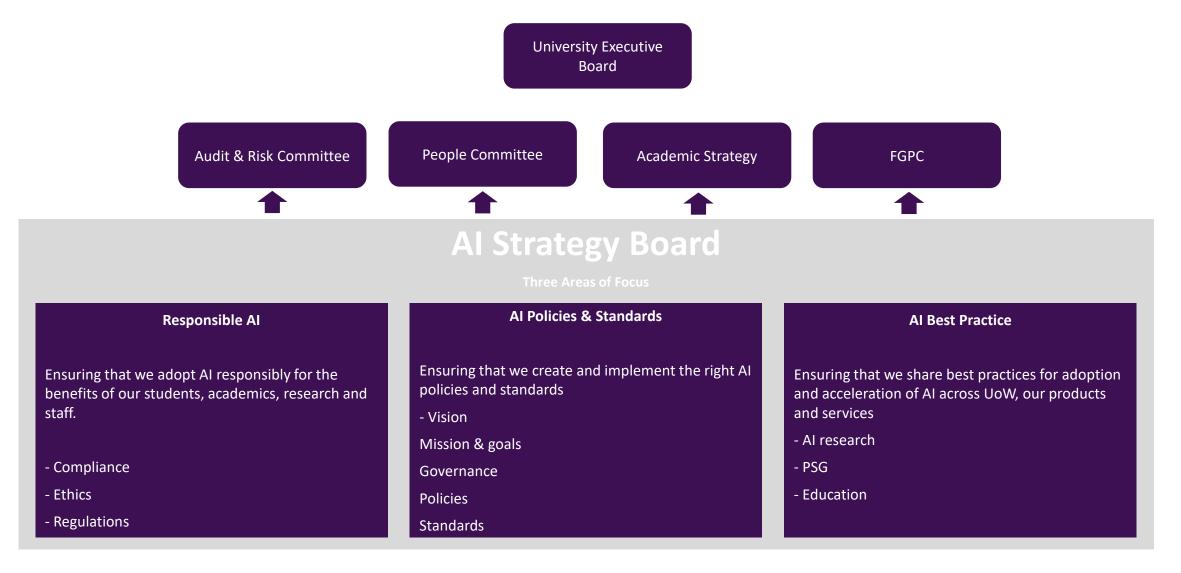
# Al Adoption Principles The OECD Recommends five principles for the adoption of Al



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 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	Al actors should respect the rule of law, human rights and democratic values, throughout the Al 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, Al actions should implement mechanisms and safeguards, such as capacity for human determination, that are appropriate to the contex 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	<ul> <li>Al actors should commit to transparency and responsible disclosure regarding Al systems. To this end, they should provide meaningful information, appropriate to the context, and the consistent with the state of art.</li> <li>to foster a general understanding of Al systems</li> <li>to make stakeholders aware of their interactions with Al systems, including in the workplace</li> <li>to enable those affected by an Al system to understand the outcome, and</li> <li>to enable those adversely affected by an Al 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</li> </ul>	
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	Al 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, Al actions should ensure traceability, including in relation to datasets, processes and decisions made during the Al system lifecycle, to enable analysis of the Al systems outcomes and responses to inquiry, appropriate to the context and consistent with the state of art. Al actions should, based on their roles, the context and their ability to act, apply a systematic risks management approach to each phase of the Al system lifecycle on a continuous basis to address risks related to Al 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





# Al 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

# Al 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

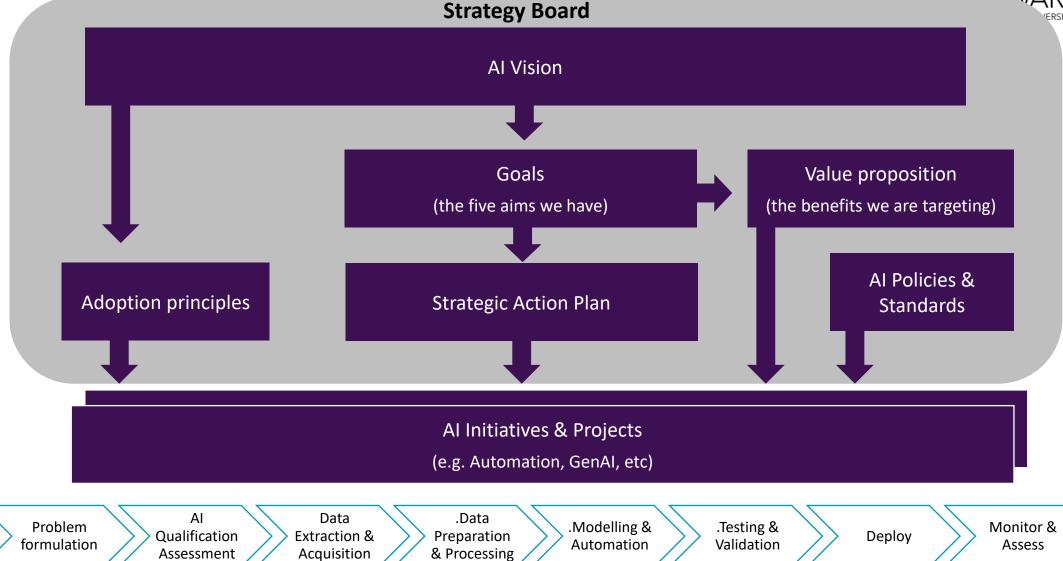
Ensuring that we share best practices for adoption and acceleration of AI across UoW, our products and services

- Al research
- PSG
- 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

# WARWICK THE UNIVERSITY OF WARWICK

#### **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 ...



# Al is innovation ... ... and innovation is in our DNA