

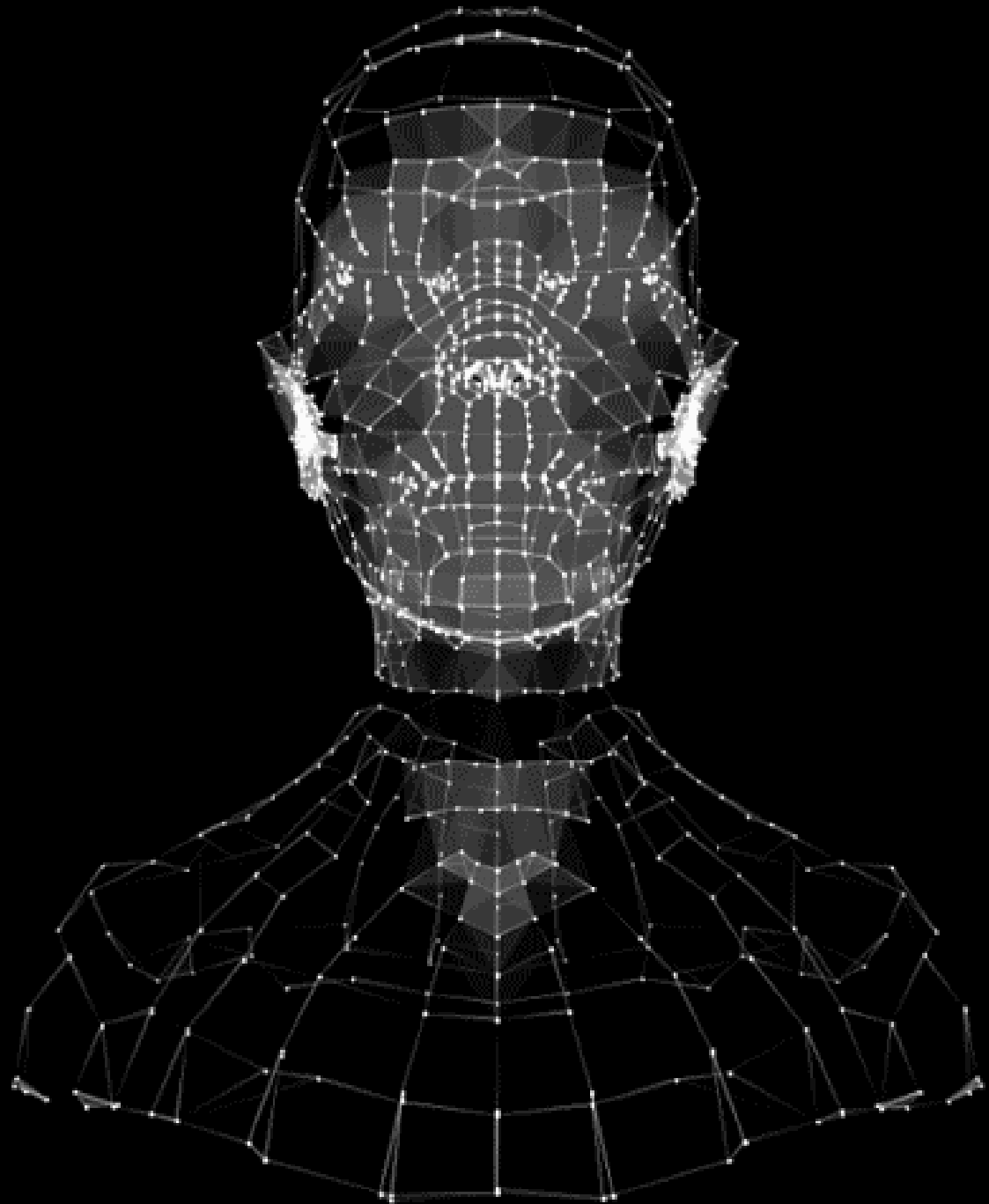
The Deloitte logo is positioned in the top left corner. It consists of the word "Deloitte" in a bold, white, sans-serif font, followed by a small green dot. The background of the slide is a dark, monochromatic image of a person wearing large, circular, futuristic glasses and a headset, with a surprised or excited expression. To the left of the person is a small, boxy robot with a head that has two circular eyes and a mouth with a grid-like pattern. The overall aesthetic is high-tech and futuristic.

Deloitte.

AI Summit Indonesia

AI National Policy- Anna Sawyer

11 November 2020



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Background



State of affairs – policies to support AI

	Organisation	Offering	Affiliation
	IEEE	Ethically Aligned Design	Industry
	CSIRO	AI-Australia's Ethics Framework	Government /Science
	Universite de Montreal	Montreal Declaration for use of Responsible AI	Science
	ACM Code of Ethics and Professional Conduct	ACM Code of Ethics	Science
	AI Partnership on AI	Principles of association across industries	Science/Industry
	Google	AI Ethics Principles	Industry
	Future of Life Institute	The Asilomar AI Principles	Science
	Niti Aayog	National Strategy on AI	Government
	OECD	OECD Recommendation on AI	Government
	European Commission	EU High Level Expert Group on AI	Government
	AI Now Institute	The AI Now Report	Science/Industry
	BAAI	Beijing AI Principles	Government/Science

Self Regulate

Self regulate is where organizations adopt governing principles and guidelines voluntarily for the benefit of common good.

Industries

Co-regulate

Co-regulate is a middle ground where both the Governments and Industries come together to bear the responsibilities to adhere to commonly agreed upon AI Ethics Principles and guardrails.

Gov & Ind

Regulate

As organizations grapple with future of a world overwhelmed by tech and AI, new laws and rules are introduced to ensure there is shared prosperity, priorities and values are shared.

Government

We need to understand AI to maximise the benefits to public service

Making sense of the umbrella term will allow us to identify and develop useful examples of AI

Artificial Intelligence

Oxford Dictionary defines AI as the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.

Deloitte segments AI into five major categories:

Robotics

Computer software (robot) is configured to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems.

- Sensor Networks
- Robotic Process Automation
- Actuators & Motion Control

Intelligent Automation

The ability for systems to sense and synthesize vast amounts of information and can automate entire processes or workflows, learning and adapting as they go.

- Real-Time Streaming
- Decision Predictions
- Workflow Management

Analytics

Using data to drive strategy and performance. It includes a range of approaches and solutions, from looking backward to evaluate what happened in the past to looking forward to do scenario planning and predictive modelling.

- Pattern Recognition
- Behaviour Analysis
- Temporal & Spatial Analysis

Machine Learning

The ability of statistical models to develop capabilities and improve their performance over time without the need to follow explicitly programmed instructions.

- Image / Video Recognition
- Image Tagging / Context
- Behaviour-Reward Optimisation

Natural Language Processing

Technology that powers voice-based interfaces for virtual assistants and chatbots, as well as querying data sets, by extracting or generating meaning and intent from text in a readable, stylistically neutral, and grammatically correct form.

- Speech to Text
- Language Translation
- Understand Intent

Not all categories of AI are created equally

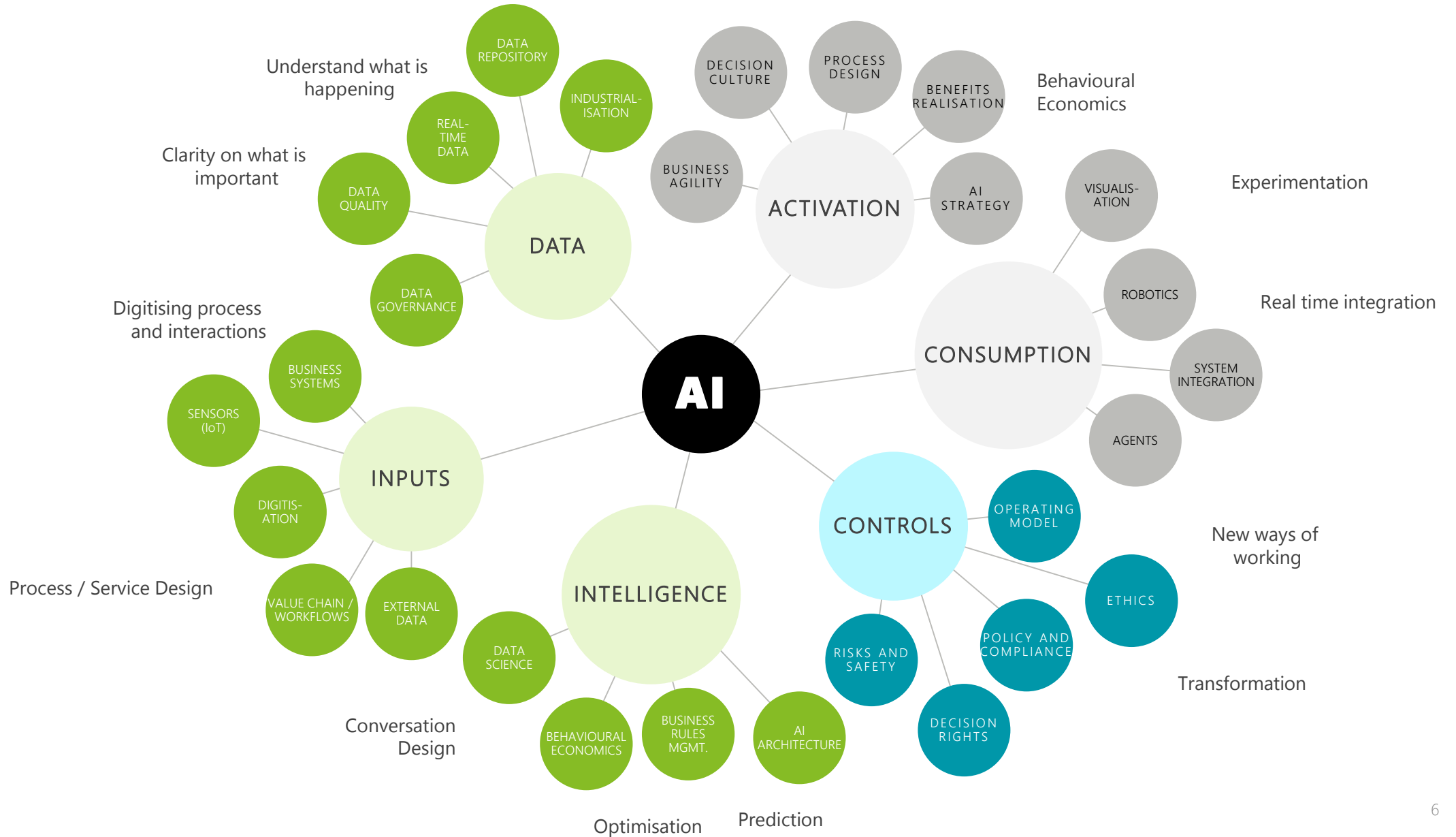
- There are differences in the underlying risks and potential that each category of AI poses to future-focused public service
- Where a robotics tool may improve the efficiency of a routine administrative task; understanding the full potential of a Natural Language Processing technology may require a more detailed analyses before truly comprehending the intended outcome



Taking a Nuanced View

- The framework and toolkits that will be developed will consider the spectrum of AI, providing the criteria and processes that key user groups should follow when procuring and developing varying AI systems

It takes an ecosystem to deliver effective AI



We need to refine AI according to the context

AI can advance many positive outcomes for societies, but there needs to be clear indicators for these benefits and risks



Universal Access

Making services globally accessible to all, including those who speak different languages or who might have visual or hearing impairments



Personalised Service

Providing a wide range of online services that leverage the same information, but cater to the specific needs of each citizen



Smart Utilities

Technology-rich utilities equipped with sensors and digital devices that analyse performance to assist service providers with optimising delivery



Intelligent Monitoring

Using AI technologies to provide personalised service and real-time monitoring of public networks such as public transport



Diagnosing Learning Difficulties

Capturing patterns and movements to diagnose learning difficulties earlier than manual observations that can take months or years for a diagnosis



Simplifying Administrative Tasks

Automation of time-intensive processes such as completion of forms



We need to consider the psychological, social, environmental outcomes as well as safety and health of all individuals.

This starts with developing a foundational understanding about AI and emerging technologies.

Ethical Considerations

- *Fairness*: ensuring that the AI technologies act in line with the Department's core values
- *Bias*: avoiding bias in the algorithms and datasets that the technology uses for learning
- *Consent*: abiding by legal requirements and obligations when utilising student's personal information

Australian Government – AI Policy Alignment

Embedding AI in contemporary public service practices means overcoming jurisdictional differences.

Federal policy



Developing a whole-of-government AI Action Plan

The Australian Government, led by the Department of Industry, Science, Energy and Resources is exploring what the focus of Australian AI policy should be in the future.

In tandem, the Australian Government is developing a voluntary AI Ethics Framework to help guide businesses and governments looking to design, develop, and implement AI in Australia

Jurisdictional policy




State based policies

Australia's states and territories are drafting and developing policies to progress and implement AI.

For example, the New South Wales' State Government have developed an AI Strategy to improve service delivery and government decision-making.

Departmental policy



Focussed AI

Each state or territory is responsible for delivering a wide range of core services from health, policing to education. AI applications across these various departments would result in different use cases.

For example, different departments may have conflicting thresholds for surveillance and use of personal information.

2019 Artificial Intelligence – Solving problems, growing the economy and improving our quality of life, CSIRO

Enabling the entire Australian economy with AI represents a complex policy and strategy challenge... (have identified) three possible AI specialisations for Australia:

1. AI for better health, aged care and disability;
2. AI for better towns, cities and infrastructure;
3. AI for better natural resource management

Deloitte's three-phase approach for developing AI Policy Framework

We propose adopting an agile, three-phased approach to develop a AI Policy Framework to maximise transparency and ensure buy-in to the development of the principles and guidelines

Purpose: AI will play a supporting role in supporting the government to engage and provide services to its citizens in a complex and dynamic society



Phase 1: Discover

Aims

1. Understand how AI fits within the broader AI Strategy.
2. Understand how stakeholders would use, develop and procure AI..
3. For stakeholders to inform the principles that should govern AI including their hopes fears and concerns.
4. Agree the definition of AI and frame the parameters.
5. Finalise the AI principles.
6. Develop an appendix of use-cases outlining how the AI principles will be lived and applied.



Phase 2: Develop

1. Support end-users to carry out duties, procure, develop and make use of AI in line with AI principles and other policies through the development of guidelines.
2. Ensure the wider governance structures and control environment are compatible with the AI governance framework.
3. Equip persona groups to be able to procure, develop and use AI.



Phase 3: Monitor

1. Ensure ongoing adoption and appropriateness (fit for purpose) of the framework.
2. Ensure the approach continues to reflect best practice governance and retains effective oversight for current requirements and future department decisions.

01



Discover



Our three-phase approach for developing an AI Governance Framework



Phase 1: Discover

Aims

1. Understand how AI fits within the broader AI Strategy.
2. Understand how stakeholders would use, develop and procure AI.
3. For stakeholders to inform the principles that should govern AI, including their hopes fears and concerns.
4. Agree the definition of AI and frame the parameters.
5. Develop an appendix of use-cases outlining how the AI principles will be lived and applied within the DoE context.

Approach

1. Literature review
 - a) Current policies and international best practice
2. Consultation
 - a) Conduct a stakeholder mapping exercise and develop persona groups.
 - b) Understand AI best practice, use-cases and relevant legislation.
3. Agree definition of AI and the parameters
 - a) Agree a comprehensive definition of AI and establish the parameters of the framework.
 - b) Develop use-cases for AI.
4. Testing and refinement
 - a) Conduct impact testing, risk assessments and ethics assessments on the principles to ensure they are comprehensive from a Human Rights approach and in line with relevant legislation, alongside industry best practice.

Key Outputs



'What Is AI' Guide and how it relates to the organisation



AI Principles Document



Stakeholder Consultation Brief



Appendix of use cases

Example: The AI Lab

An interactive hands-on workshop, exploring AI technologies and applications

Objective: Bring leaders up to speed on AI, to understand the transformative potential for their organisation, and where to start for immediate impact.

Target audience: Leadership and key business practitioners

Agenda:

1 Context

- **Today's exponential world**
Predictions for the impact of AI, and the future of work.
- **Demystifying Artificial Intelligence**
AI defined in pragmatic terms and with real-world examples. Breaking down the different technologies associated with AI, and the skills they enable.
- **AI for impact**
Discuss the core purpose of your organisation, and the impact participants want to make in their respective areas of the business.

2 Immersion

- **Hands on with AI technology**
Demonstrations and interaction with different AI technologies and applications relevant to your industry / organisation.
- **Use case exploration**
Deep dive into 1-2 use cases for AI. Explore how each one works and the technologies employed end-to-end in terms of inputs, intelligence and actions.

3 Making it happen

- **Success factors for AI**
Considerations of the capabilities required to build and embed AI solutions, and the decisions required (agency, accountability, ethics, controls, etc...)
- **The Day After Tomorrow Mindset**
The importance of thinking beyond today and tomorrow in an exponentially changing world.
- **AI applied**
How can AI technologies propel your strategic priorities? Can any work your organisation has done so far be leveraged/ scaled/ iterated?

Example: Use Case Exploration

1. Form groups around your functions, or areas of interest
2. Discuss ways that AI could make an impact to the WHY of your chosen function
3. Capture potential use cases on the canvas
4. Consider:
 - *what AI skills will be applied?*
 - *what mode is being used?*
 - *what could be the value?*
 - *how hard will this be to deliver?*
5. Assign a business owner for each use case

What is the Why? Relevant purpose statement Primary Business Owner

High level use case description

Which AI skills will be applied? (please circle any skills that are applicable to the delivery of the use case)

DATA ANALYSIS
 SPEECH ANALYSIS
 IMAGE ANALYSIS
 AUTOMATION
 COMMUNICATION
 CREATION

What is the primary mode?

ACTING
 INTERACTING UNDERSTANDING

Potential use case value

LOW MED HIGH VHIGH

Implementation complexity

LOW MED HIGH VHIGH

02

Develop



Our three-phase approach for developing an AI Governance Framework



Phase 2: Develop

Aims

1. Support end-users to carry out duties, procure, develop and make use of AI through the development of guidelines.
2. Ensure the wider governance structures and control environment.
3. Equip persona groups to be able to procure, develop and use AI in accordance with policies, frameworks and principles.
4. Consolidate the outputs into a final, user-friendly framework.

Key Outputs

	<p>5 sets of guidelines on:</p> <ul style="list-style-type: none"> • Procurement • Data • Implementation • Maintenance • Delegations of Authority and Responsibility 		<p>Decision-making toolkits</p>
	<p>Stakeholder Consultation Report</p>		
	<p>Consolidated final framework</p>		

Approach

1. Current governance and policy review
 - a) Conduct a review of relevant internal policies and governance structures to develop an understanding of the impact of AI on current processes.
 - b) Produce a gap analysis of areas that require strengthening from an AI governance approach and make any recommendations.
2. Development of guidelines
 - a) Test the guidelines from an end-user perspective.
3. Develop resources
 - a) Develop resources to guide users through principles and guidelines to operationalise the framework. This may include:
 - Decision-making models
 - Checklists
 - FAQs or question banks
4. Contextualise toolkits
 - a) Contextualise toolkits and standardise in line with existing resources for relevant persona groups.

Example: Deloitte's AI Ethics Framework

Problem statement



As AI is increasingly applied across industries, AI-driven systems have an unprecedented scale of impact on our lives with often unforeseen or unintended societal implications. Ensuring that this impact is aligned to our ethical values and principles is challenging.

Deloitte AI ethics framework



Impact

AI for good <i>Adding positive value</i>	Do no harm <i>Ensuring safety</i>
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Regardless of intent, AI should be used to benefit the customers and should not be used to cause harm to society

Themes: safety, resilience, access, AI for good, accountability

Justice

Non-discrimination <i>E.g. reducing disparate treatment</i>	Reducing inequality <i>E.g. financial inclusion</i>
---	---

AI should treat people fairly regardless of protected features (e.g. race, gender) and endeavour to reduce inequality

Themes: anti-discrimination, inclusion, disparate treatment, disparate impact

Autonomy

Control <i>Ability to challenge and manipulate AI</i>	Understanding <i>Transparency and explainability</i>
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AI should be well understood and non-manipulative, empowering people to challenge and overrule AI decisions

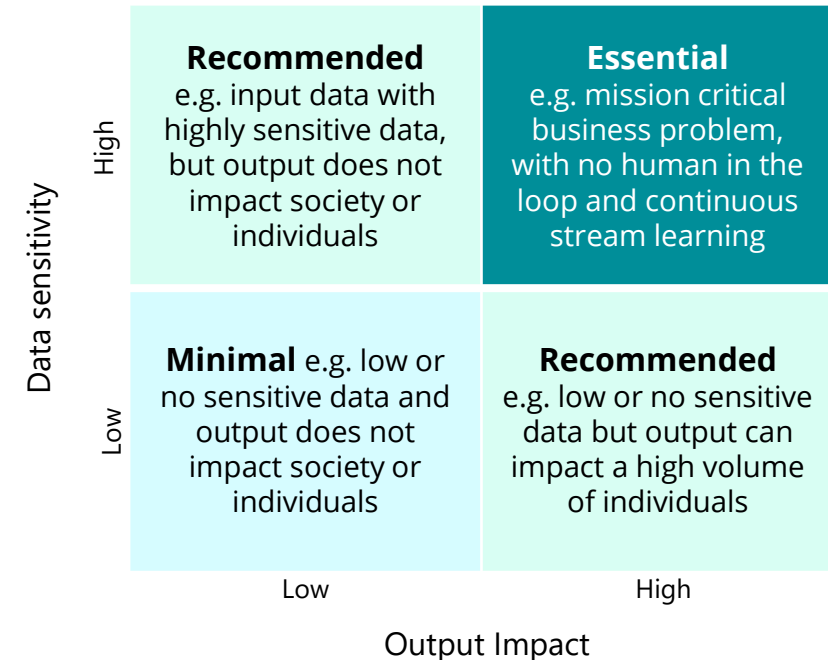
Themes: vulnerable customers, privacy, self-determination, explanation, human-in-the-loop, augmented workforce, freedom of choice

Practical considerations



Efforts to implement ethical values must be of high priority. Ethical considerations must be considered within the context of relevant regulations, guidance, court cases, and legislations.

Certain AI applications will be subject to higher scrutiny based on the sensitivity of the input data and the impact of the output on the customers:



Example: Model Risk Assessment Report

This is one of the assets that would be delivered as a part of our Proposition

Decisioning System - Risk Profile Report

Business Problem: Automated Roll Marking in Schools
Model: LBPH
Data Steward: Jill Pollon
Approved Date: 12 Dec 2019

- ✔ Overall Risk Low
- ⊖ Alignment to Principles Med
- ✔ Intended Use **Face Recognition to support teacher in roll marking.**
- ⊖ Not suitable for Track student punctuality
- ✘ Compliance GDPR
- ✘ Refresh Date 30th Mar 2020
- ✘ Dependencies FACE API | OpenCV

Conditionally Approved ✔

AI Ethics Principles Compliance

- ⊖ Compliance Score Med – 6.5/10
- ✔ High on Compliance Wellbeing | Use-Respect for Context
- ⊖ Med on Compliance Data Security | Privacy | Fairness
- ✘ Low on Compliance Transparency | Accountability | Integrity

- Data deleted after recognition task is performed
- Data obtained with consent
- Encryption at rest and over the wire
- Group Fairness scores medium
- No third parties to share the information with
- Uses Pre-trained models
- Not defined compliant data backup policy
- No access to review inaccurate labelling

Data Assessment

Datasets Used:

- SCFace
- CelebA
- Face API

- ✔ Data Gaps Med – Gaps in 2/3 protected attributes
- Proxies Synthetic images used to improve distribution
- Consent Consent obtained from 80% of users
- ✘ Data Bias Distribution of training data is non-uniform
- ✘ Data bias mitigation None
- ✘ Data Drift Detection Frequency Drift check every 2 weeks

Fairness Metrics

Fairness Types: Group Fairness, Representational Harm, Process fairness, Individual Fairness

- ✘ Low **Group Fairness**
Statistical Parity, Demographic Parity, Accuracy Equity
- ✘ Low **Process Fairness**
- ✘ Low **Individual Fairness**
Equal thresholds
Similarity Metric
- ✘ Low **Representational Harms**
Bias amplification
Stereotype Mirroring

03

Monitor



Our three-phase approach for developing an AI Governance Framework



Phase 3: Monitor

Aims

1. Ensure ongoing adoption and appropriateness (fit for purpose) of the framework.
2. Ensure the approach continues to reflect best practice governance and retains effective oversight for current requirements and future department decisions.

Approach

1. Control Framework Definition
 - Conduct detailed risk assessment on data and algorithms and document all issues and risks against the six components of Deloitte's Trustworthy AI framework.
 - Identify modifications to the solution development lifecycle to better support the implementation of controls.
 - Establish a flexible control framework based on identified data ethics risks and issues to govern AI use cases, optimizing for cost.
 - Develop risk control roadmap with high level sequencing based on highest risk items.
2. Ongoing governance structure development
 - Establish a flexible governance framework to guide ongoing AI development that sustain with respect to ethical framework; embed process for monitoring risk exposure and risk.
3. Ongoing Review
 - Ongoing review of technology updates as AI capabilities mature and resulting implications on the Governance Framework or use-cases may be required.

Key Outputs



Control framework and Governance model definition



Technology Development Update Reports

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Further reading



We are passionate about this topic

Deloitte publishes a wide range of thought leadership on Artificial Intelligence and Ethics

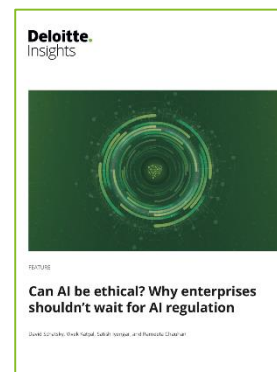
AI Ethics: The Next Big Thing in Government



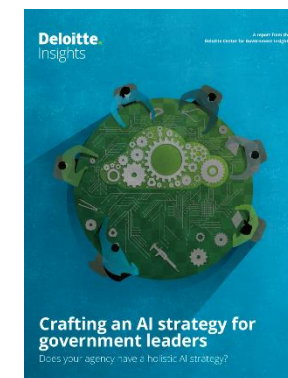
AI-augmented government



Can AI be ethical? Why enterprises shouldn't wait for AI regulation



Crafting an AI strategy for government leaders



Transparency and Responsibility in Artificial Intelligence
Explores the vision on transparent and responsible AI



Capitalizing on the promise of artificial intelligence
Perspectives on AI adoption from around the world



Building the Lucky Country: The path to prosperity: Why the future of work is human
The series has been developed to prompt debate and conversations across business, industry associations, government and the media on issues facing the Australian economy.



Cognitive Technologies: The real Opportunities for Business
Examines the evolution of cognitive technologies and how it is being used in organisations today



Taking a proactive approach to the ethics of AI
Examines how Ethical challenges should demand attention right from the start of AI initiatives



Robotic process automation: A path to the cognitive enterprise
Bots can automate routine tasks and eliminate inefficiency, but what about higher-order work requiring judgment and perception?



Ethical Tech: Making ethics priority in today's digital organization
Examines the relationship between a company's tech savviness and its focus on various ethical issues related to technology



The paradigm shift: Redefining education
Suggests that there is a mismatch between the perceived purpose and role of education, and the demands of the modern worker



The Fourth Industrial Revolution: At the intersection of readiness and responsibilities
Examines the intersection between readiness and responsibility in the Industry 4.0 era

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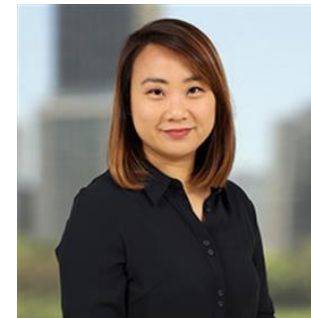
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