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Policy Observatory

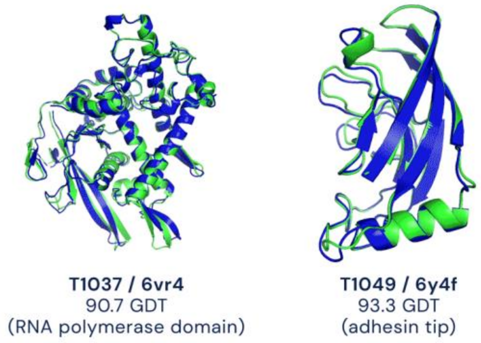
Enabling effective AI policies: Launch of the OECD Framework for Classifying AI Systems

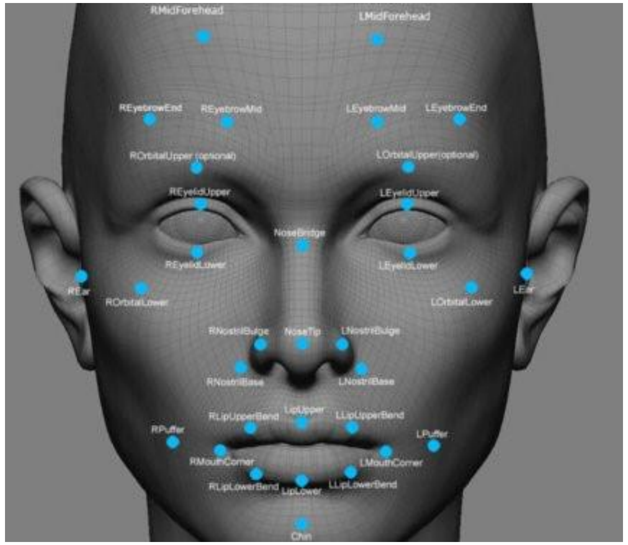
International Conference on AI in Work, Innovation, Productivity and Skills, *22 February 2022*

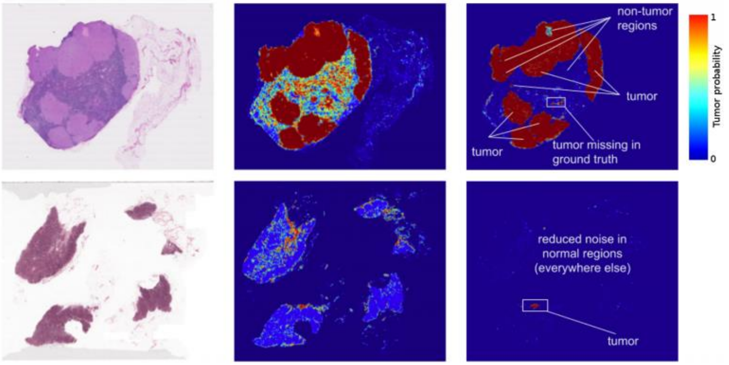
OECD

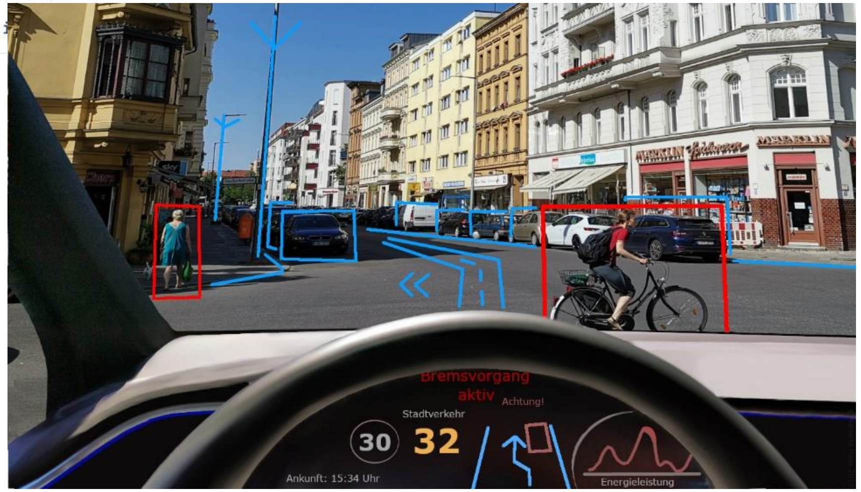
Why classify AI systems?

A variety of systems and policy implications






non-tumor regions
tumor
tumor
tumor missing in ground truth
Tumor probability
1
0
reduced noise in normal regions (everywhere else)
tumor



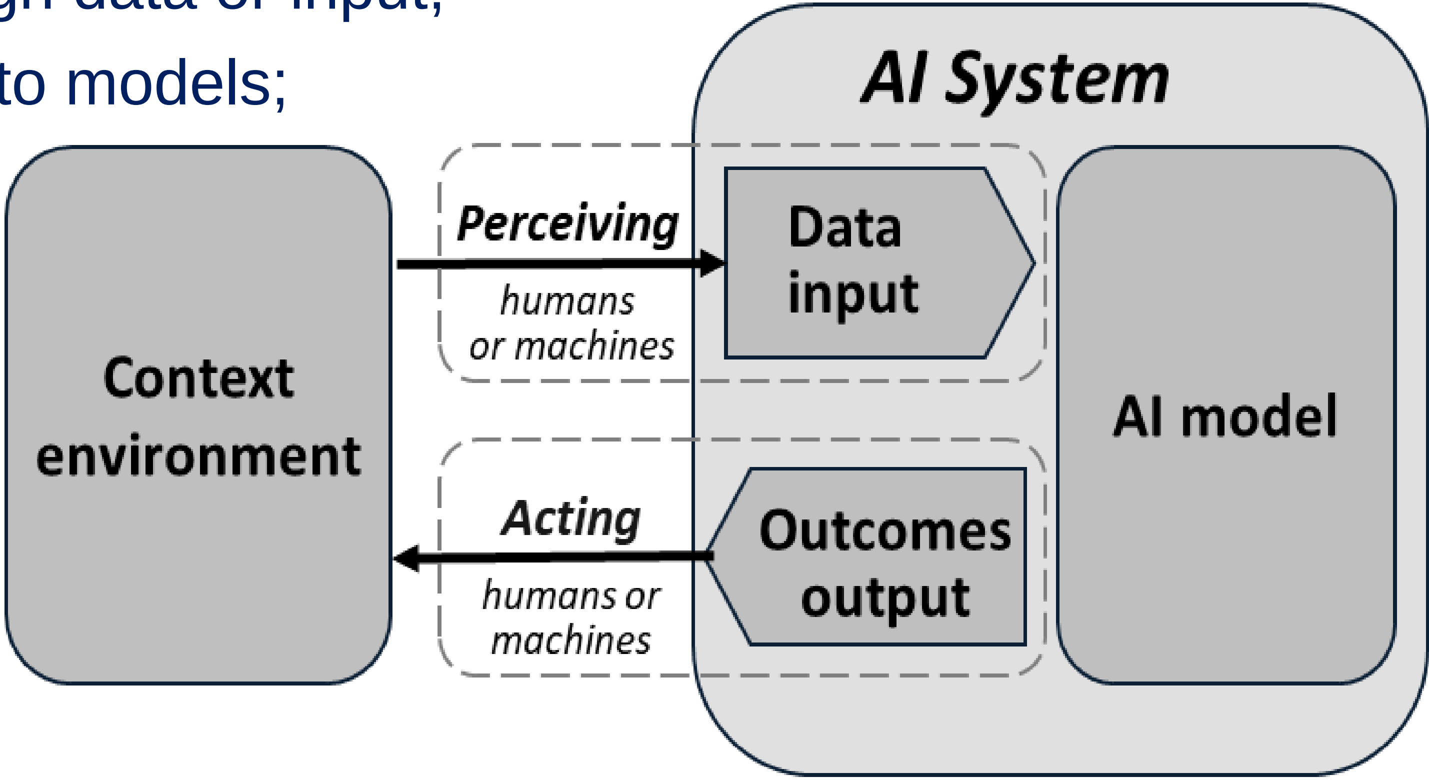
OECD AI System Definition (OECD, 2019)

“An AI system, is a machine-based system that is capable of influencing the environment by producing an output (recommendations, predictions or decisions) for a given set of objectives.

i) perceives environments through data or input;

ii) abstracts these perceptions into models;

iii) uses the models to formulate options for outcomes.”



OECD Framework for Classifying AI systems: Key dimensions characterise AI systems' policy impact

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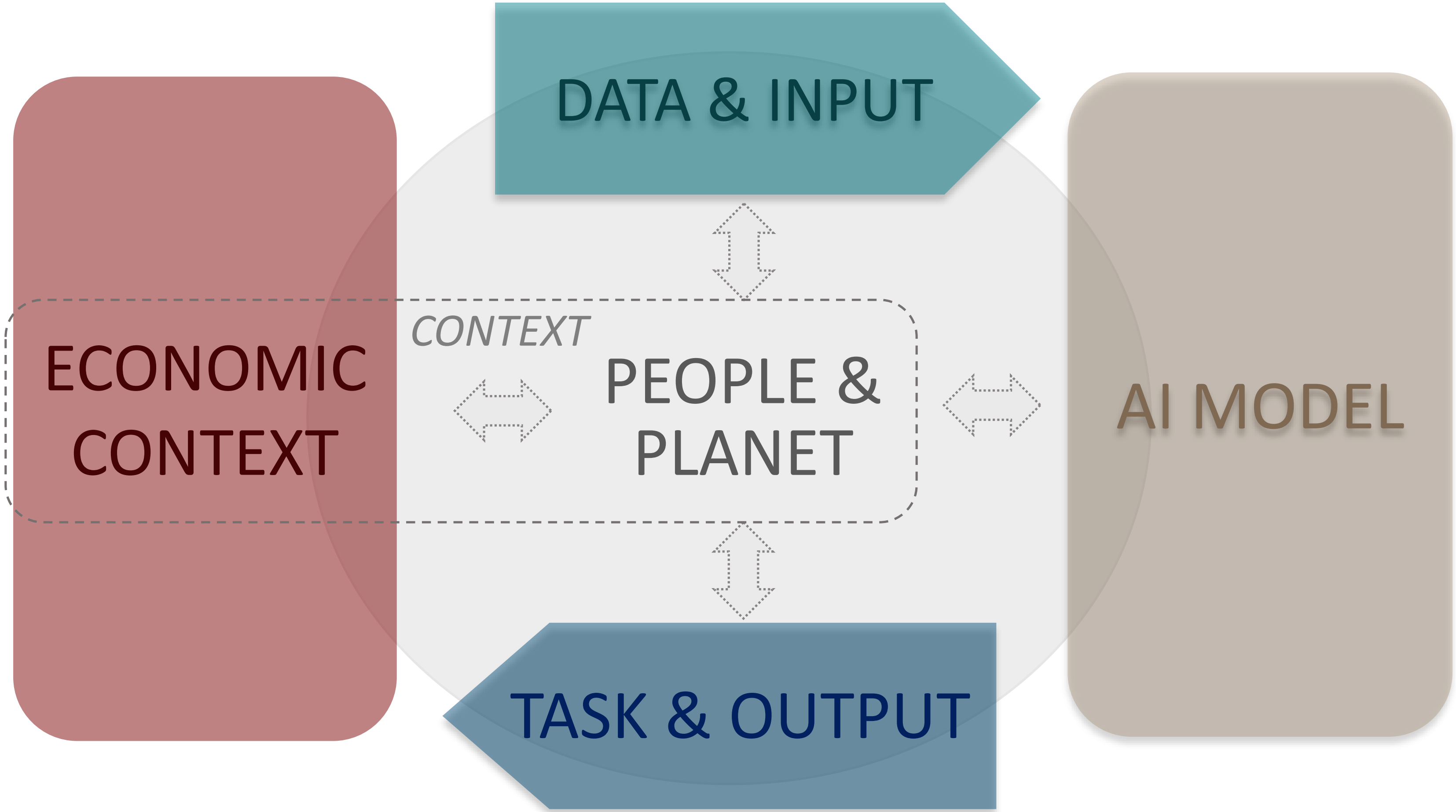

Linking the classification & AI system lifecycle actors

Framework dimensions	*People & Planet*	Economic Context		Data & Input	AI Model		Task & Output
Actors include	*End-users & stakeholders*	System operators		Data collectors & processors	Developers & modellers		System integrators
Lifecycle stage	*Use or are impact by*	Plan & design	Operate & monitor	Collect & process data	Build & use	Build & validate	Deploy

Uses of the OECD AI Classification Framework

APPLICABILITY: Most relevant to classifying specific AI applications, rather than generic AI systems

GOAL: Provide a baseline framework to help support and advance :

1. a common understanding of AI, and metrics.
2. structure registries or inventories of AI systems.
3. sector-specific frameworks, e.g. in healthcare (NICE).
4. **risk assessment and incident reporting** (***next steps***).
5. risk management & work on accountability along the AI system lifecycle (***next steps***).

PROCESS:

- Consensus of group of 60+ experts
- Testing & public consultation May-June 2021:
  > 850 comments & survey responses => Adapted framework.

Sincere thanks for invaluable input to all who commented and tested the framework. 🙏

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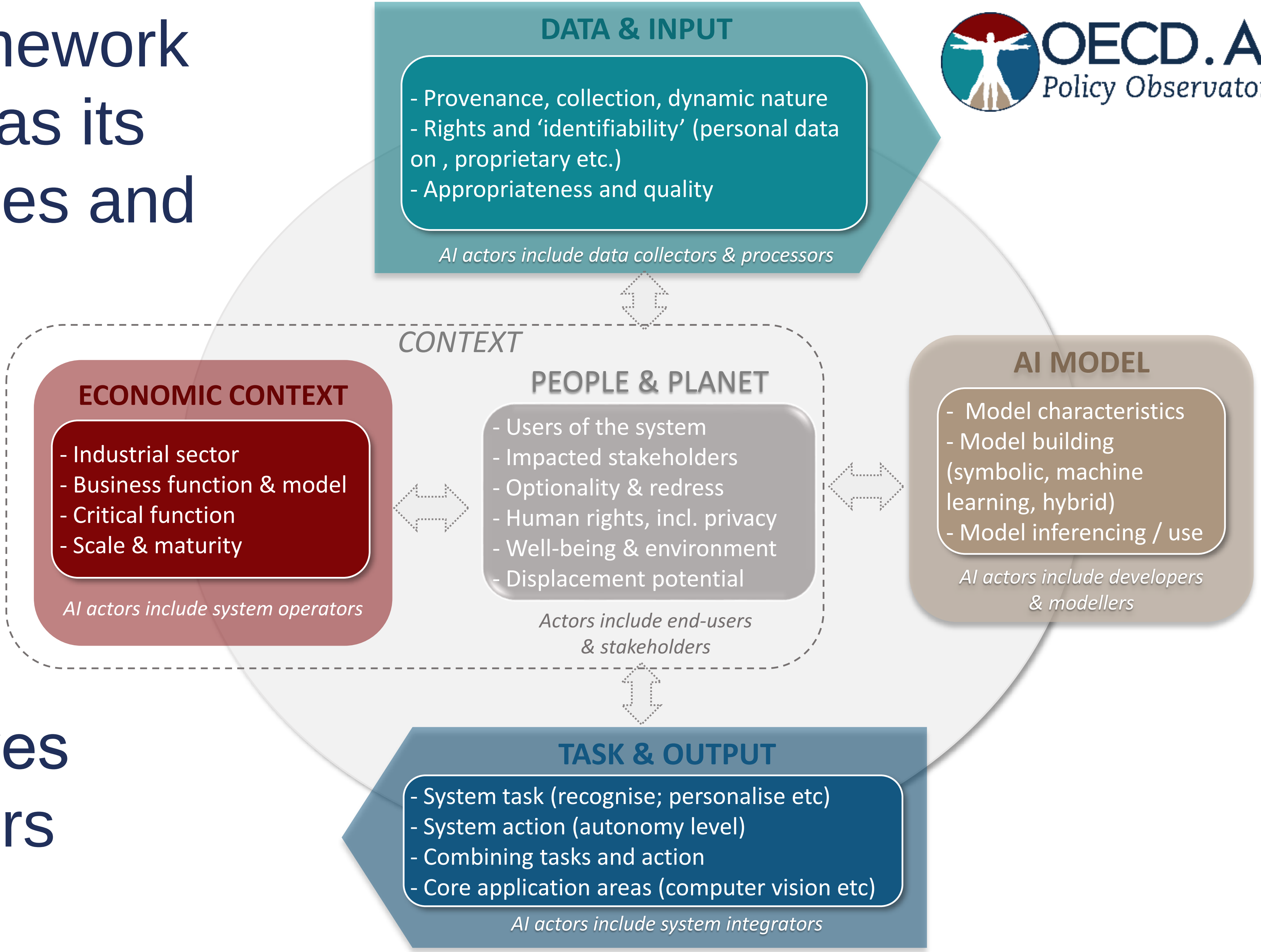
Each AI framework dimension has its own properties and attributes…



DATA & INPUT

- Provenance, collection, dynamic nature
- Rights and ‘identifiability’ (personal data on , proprietary etc.)
- Appropriateness and quality

AI actors include data collectors & processors

CONTEXT

ECONOMIC CONTEXT

- Industrial sector
- Business function & model
- Critical function
- Scale & maturity

AI actors include system operators

PEOPLE & PLANET

- Users of the system
- Impacted stakeholders
- Optionality & redress
- Human rights, incl. privacy
- Well-being & environment
- Displacement potential

Actors include end-users & stakeholders

AI MODEL

- Model characteristics
- Model building (symbolic, machine learning, hybrid)
- Model inferencing / use

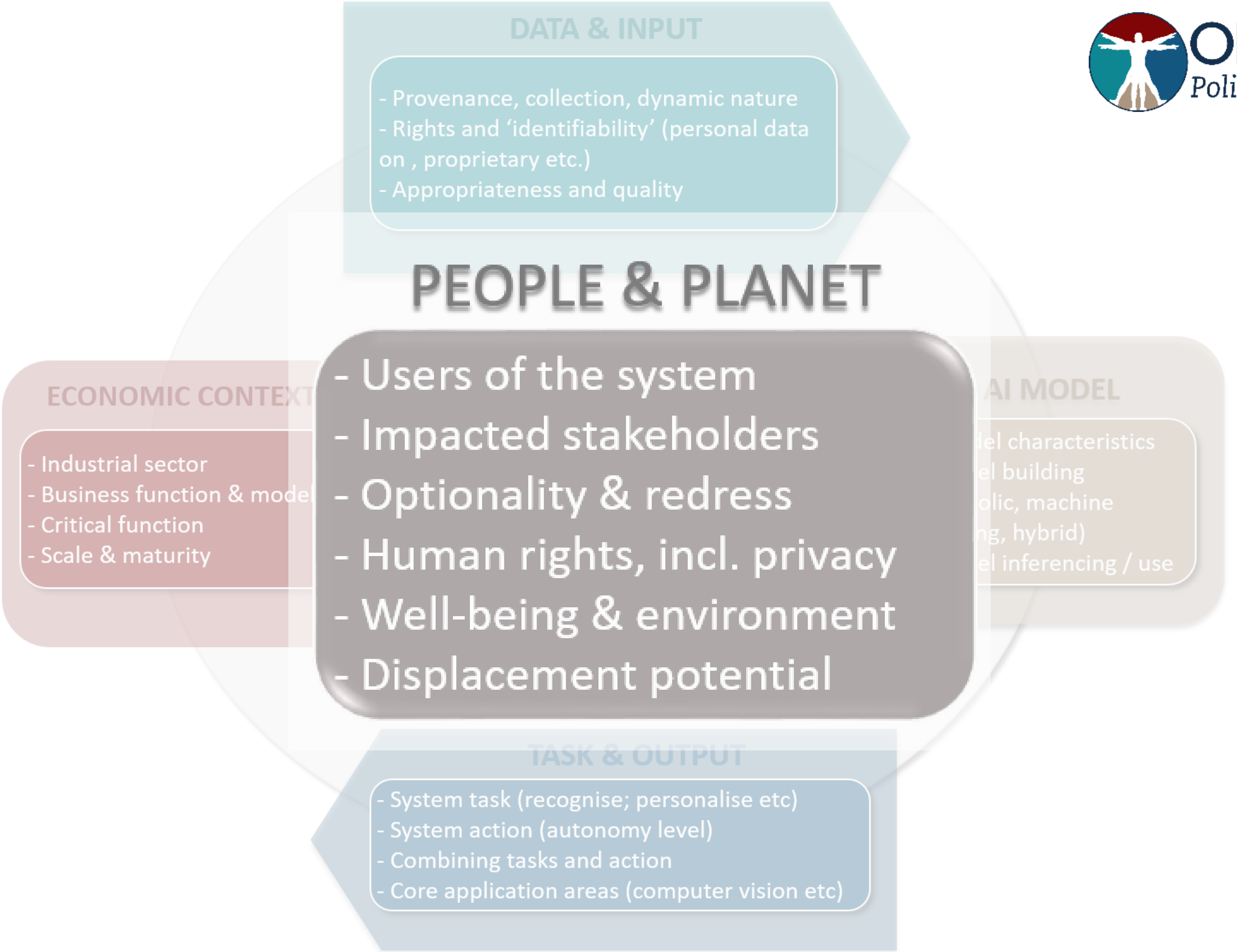
AI actors include developers & modellers

TASK & OUTPUT

- System task (recognise; personalise etc)
- System action (autonomy level)
- Combining tasks and action
- Core application areas (computer vision etc)

AI actors include system integrators

…and involves specific actors



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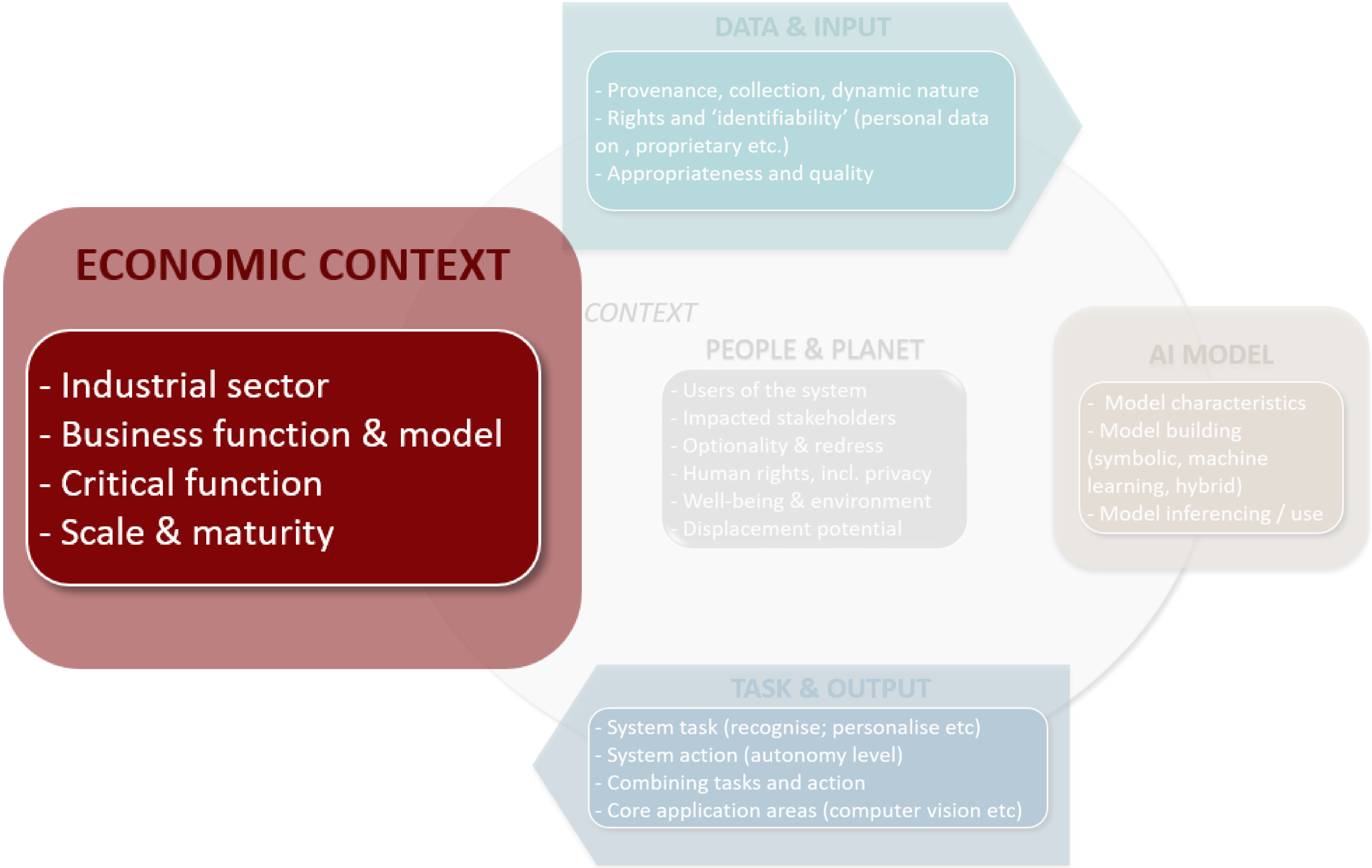

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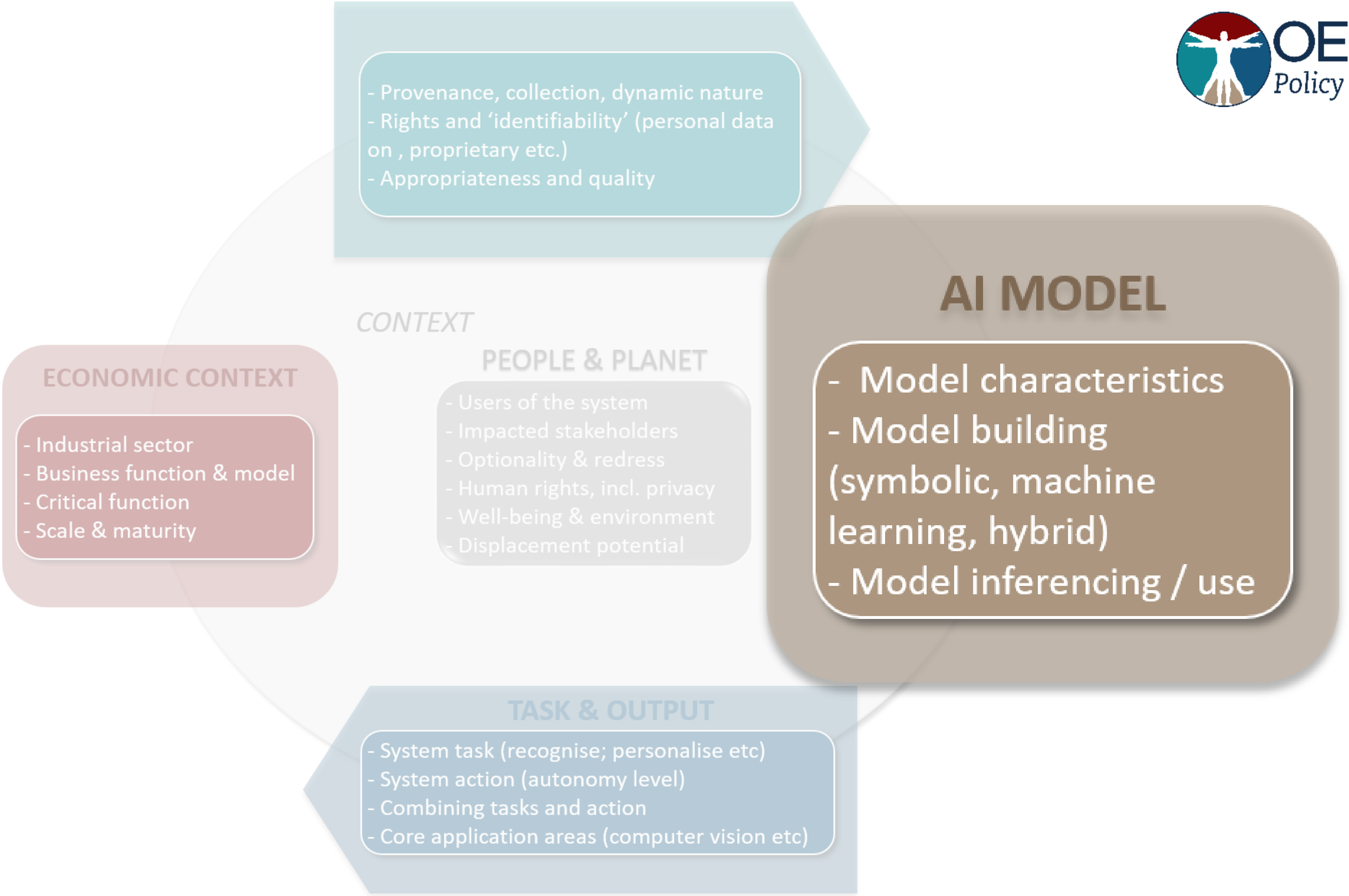

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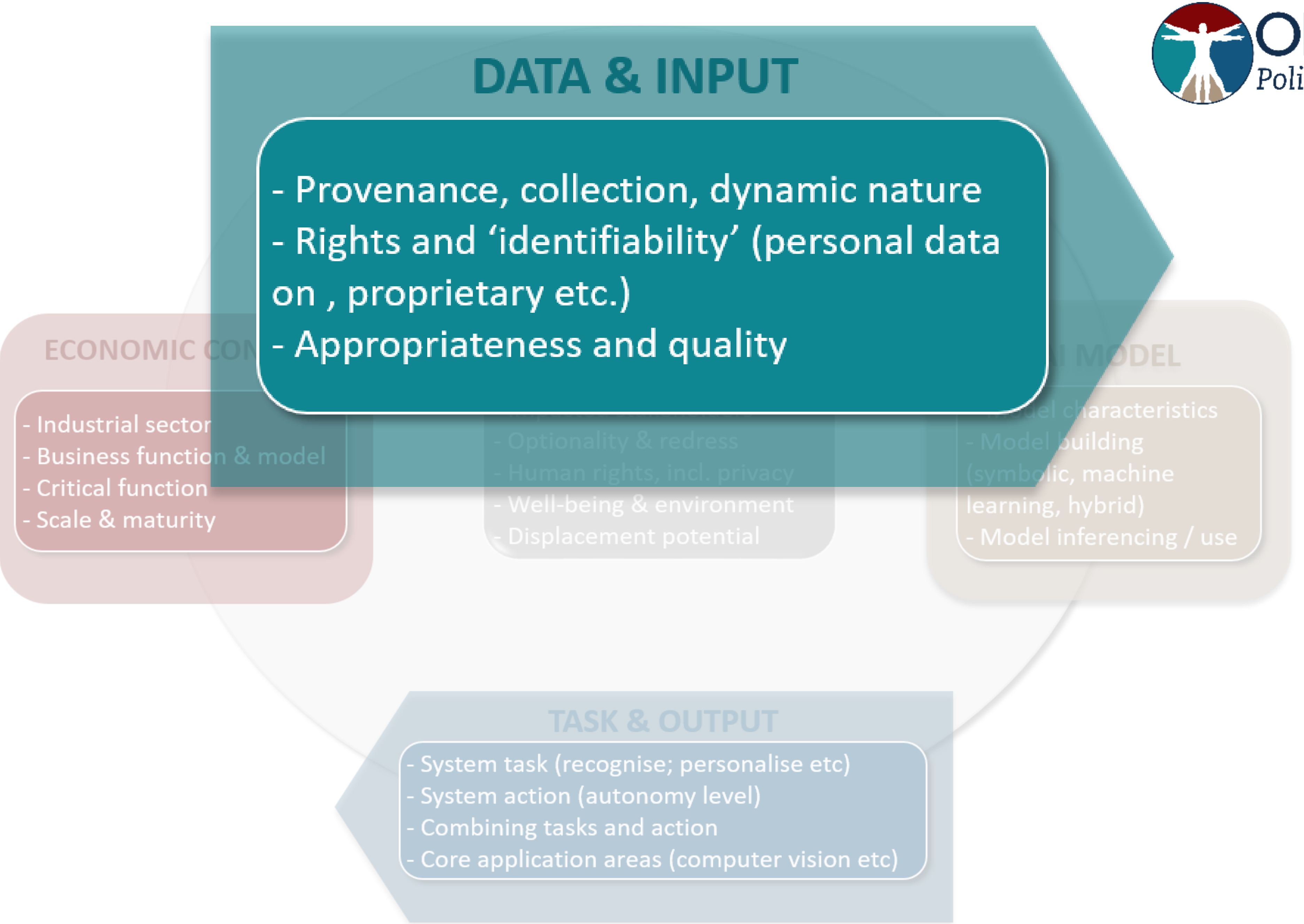

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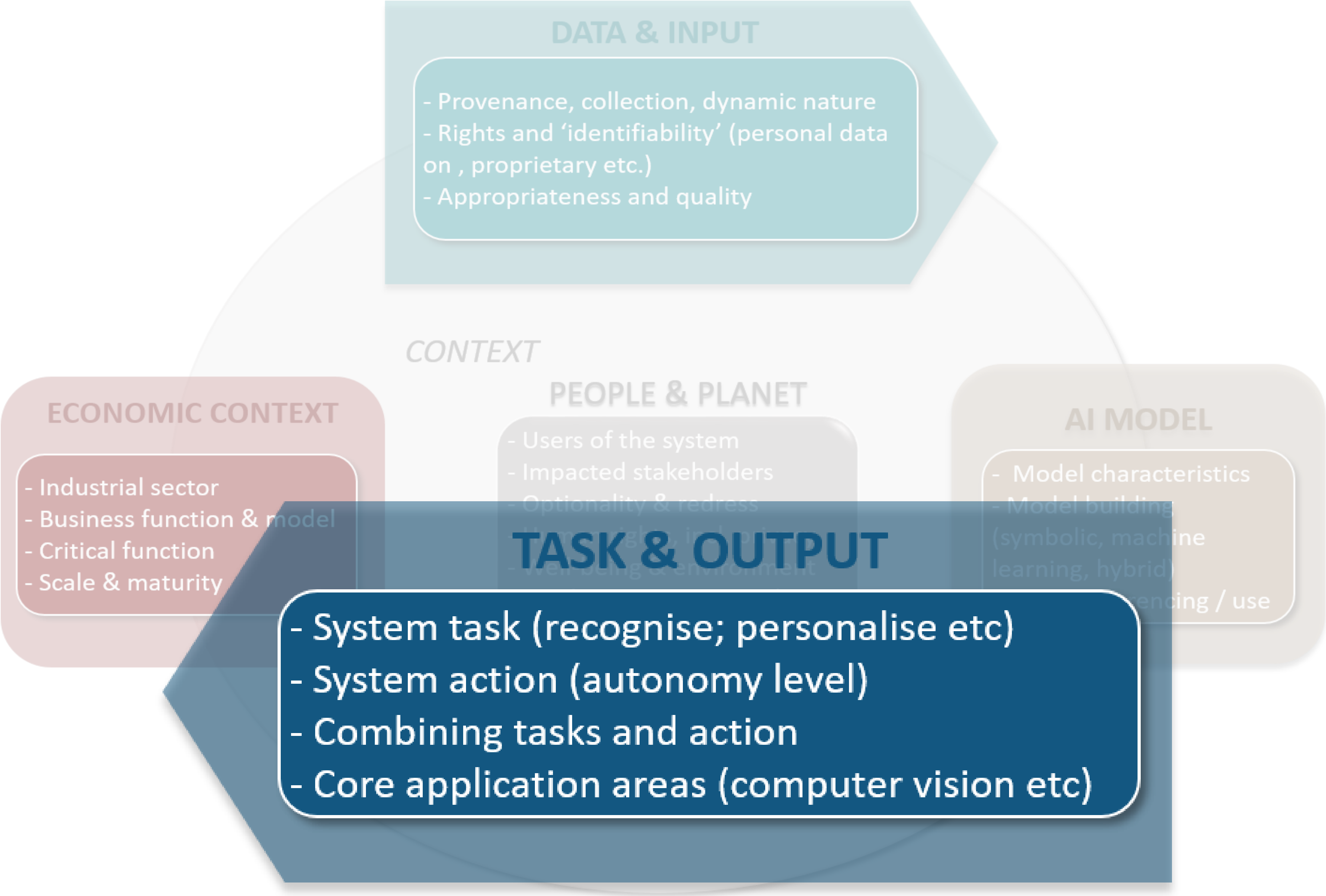

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- Human rights, inclusion
- Well-being & environment

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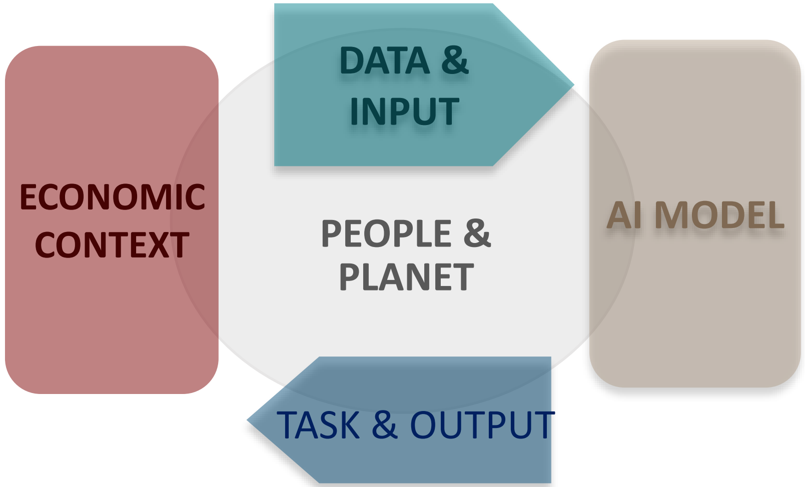
Testing the framework with real AI systems

Key conclusions from survey responses :

- The framework is best suited to **specific applications of AI systems** rather than to generic AI systems => the more specific the applications, the more consistent the survey responses.
- Respondents were better at classifying criteria in **People & Planet** and **Economic Context**. Classifying **Data & Input, AI Model, and Task & Output** often requires more technical information than is available publicly.



Example 1: Credit-scoring AI systems

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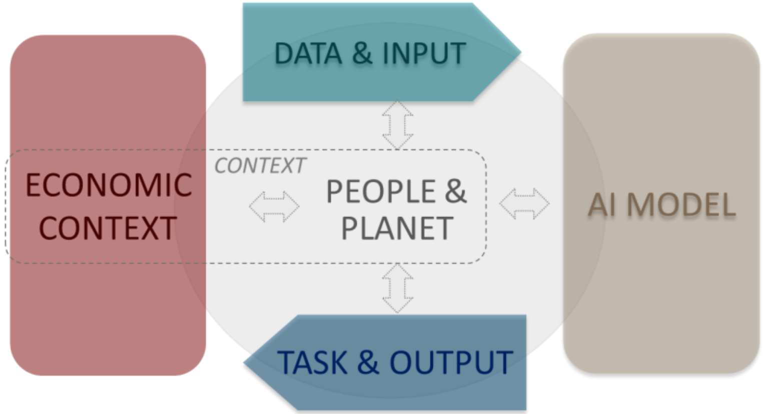
Selected criteria:



- **System users –** Amateur (bank employee)
- **Optionality –** Cannot opt out
- **Human rights impact –** Yes
- **Sector of deployment** – **Financial system (e.g., banking, insurance)**
- **Critical function** – **Critical function/activity (availability of financial services, inclusion)**
- **Data collection –** Human (set of rules) and automated sources (e.g. profiles, loan payments)
- **Rights** – Mix of proprietary and public data
- **"Identifiability" –** often personally identifiable data
- **Model building** – e.g., statistical/hybrid model; learns from provided data, augmented by human knowledge
- **Model evolution** – Can evolve during operation
- **System task** – Forecasting: uses past & existing behavior to predict future outcomes
- **Level of action autonomy** – Medium (human on-the-loop)

Example 2: GPT-3, text generation

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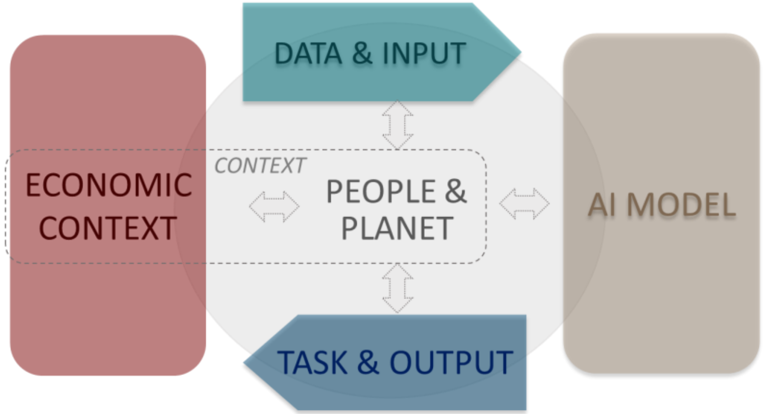
Selected criteria:

Caveat: general purpose AI system, so nearly all responses depend on the specific application context! Medical advice, content filter, creative writing…

- **System users** – Primary users are amateur
- **Impacted stakeholders** – workers, consumers
- **Sector of deployment** – Information & communication
- **Critical function** – None
- **Data collection** – Human sources (text strings)
- **Rights** – Largely public data sources (some proprietary)
- **Model building** – Learn from provided data
- **Model evolution** – Evolution during operation
- **System task** – Goal-driven optimization, Reasoning with knowledge structures, interaction support, recognition, personalisation
- **Level of action autonomy** – Low autonomy [human action required e.g., to use generated text]

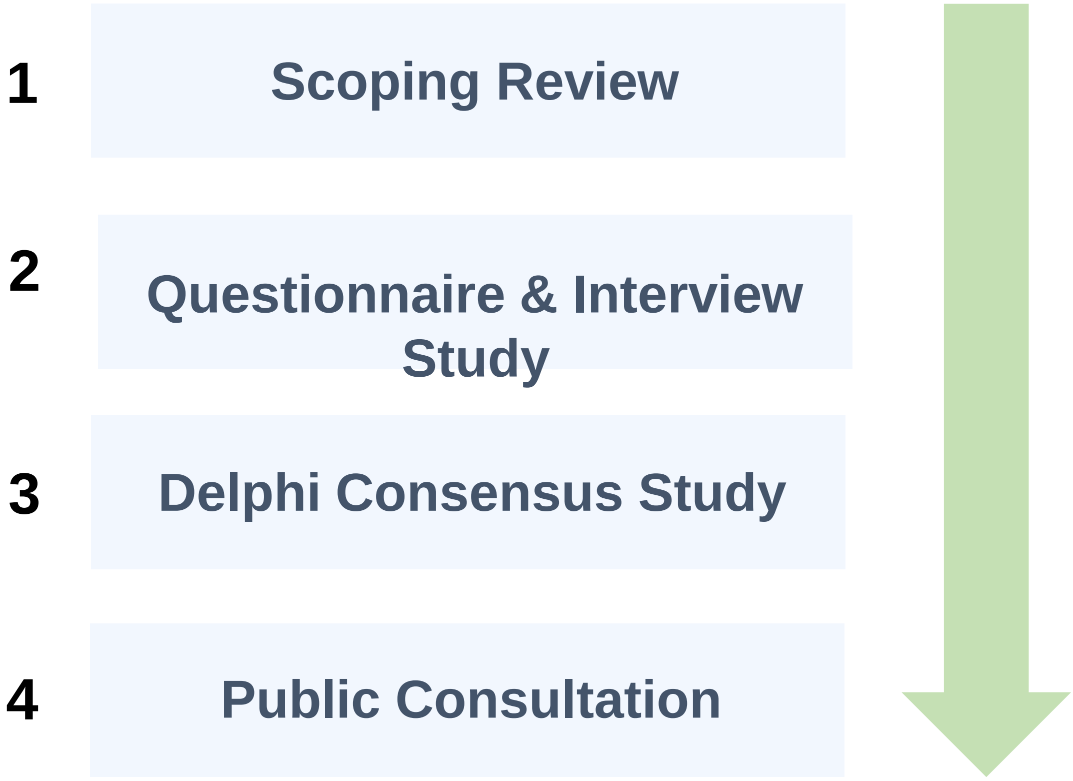


Imperial College London

The Alan Turing Institute

UNIVERSITY OF BIRMINGHAM

Using the framework to frame evidence standards for healthcare



1 Scoping Review

2 Questionnaire & Interview Study

3 Delphi Consensus Study

4 Public Consultation

- OECD classification framework was independently ranked as most complete system from a shortlist of 21 candidates when mapped against the 9 core domains of HTA (EUnetHTA)
- Highest rated by a global multistakeholder panel of experts in both a questionnaire and interview study
- Framework now pivotal in developing evidence standards to underpin post-market evaluation in UK health sector

Using the framework for health technology assessment

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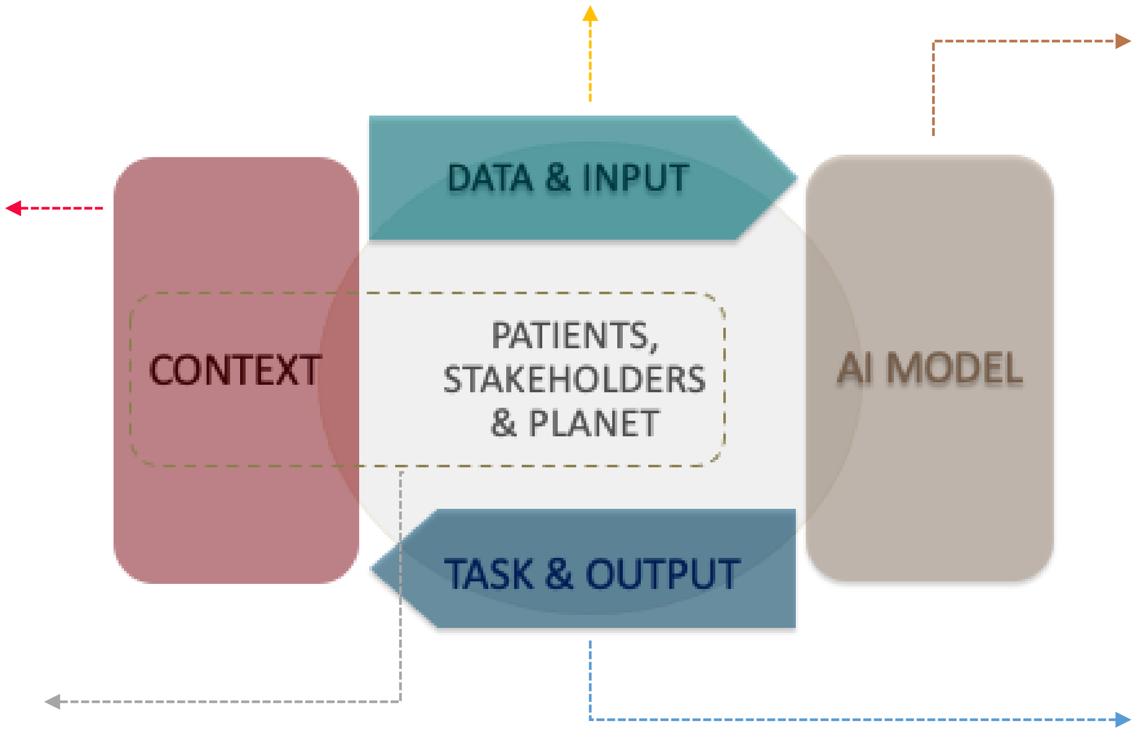
Input description



Clinical liability

Current use

Changes to data flows

Local deployment factors

Local performance

Model reporting

Training data reporting

Performance in different groups

Handling outlier data

Harm

Autonomy

End-user training

End-user well being

End-user/patient autonomy

Consent

Communication strategies

Output description

Post deployment change management plan

Benchmarking

Oversight committees

Next steps at the OECD:

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- **Refine classification criteria**
  - Add more real-world AI systems and identify possible indicators
- **Develop a risk assessment framework** **to facilitate global interoperability**
  - leveraging the classification plus possible governance at the corporate, institution or AI systems level
  - Leveraging work in partner organisations, including EU, US, ISO
  - Leveraging risk assessment work in other parts of the OECD
  - Develop a common framework for reporting about AI incidents.
- **Support risk management**: Inform related work on mitigation, compliance and enforcement along the AI system lifecycle, and responsible business-impact assessment.

Reminder: Risk categorisation of **uses of AI** in the draft AI Act of the EU

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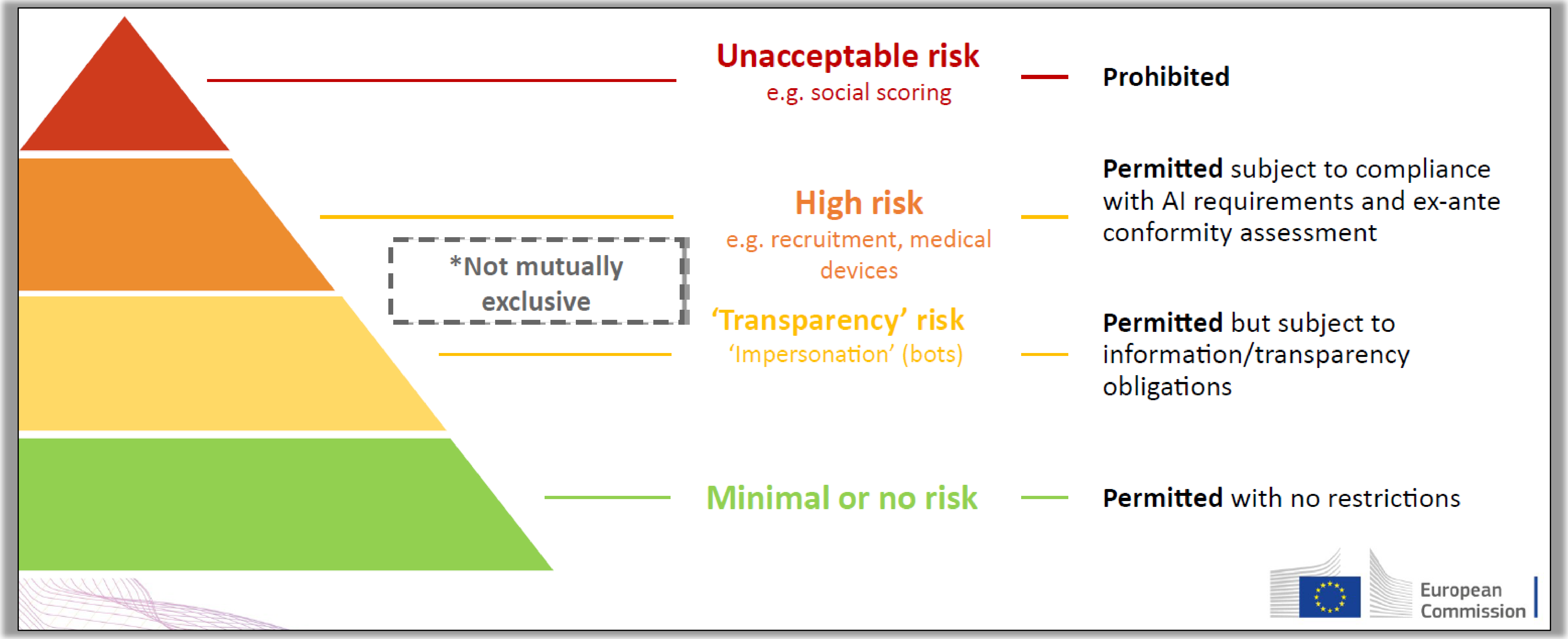

Unacceptable risk
e.g. social scoring
— **Prohibited**

High risk
e.g. recruitment, medical devices
— **Permitted** subject to compliance with AI requirements and ex-ante conformity assessment

*Not mutually exclusive

'Transparency' risk
'Impersonation' (bots)
— **Permitted** but subject to information/transparency obligations

Minimal or no risk
— **Permitted** with no restrictions

European Commission

Details will be needed on European regulation/standardisation aspects …

- Rules:
  Mapping of uses of AI to these four categories (detailed rules, examples …)

- Governance:
  AI integration into / extension of frameworks for –
  - risk management
  - risk mitigation

- Tools:
  Assessment tools to operationalize mapping rules, due diligence, AI governance etc.

Formal EU standardisation requests expected H1/22

Harmonised standards created by ESOs, especially CEN-CENELEC JTC21

Mix of actors, including private sector, European Commission, NGOs, …

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For more information visit
www.oecd.ai/classification

email: ai@oecd.org

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