

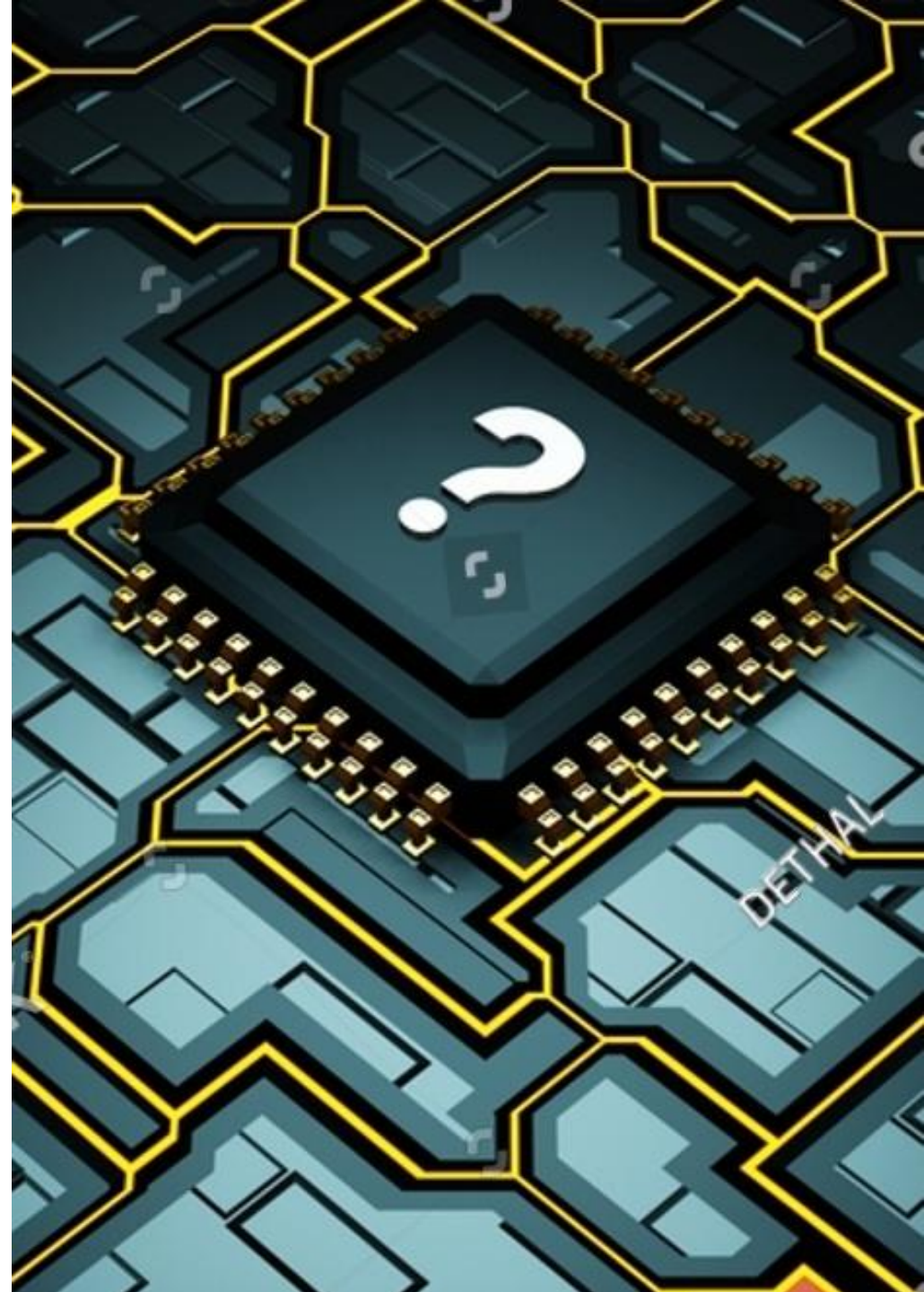


AI Considerations

Sophie Ray

AI — A Semantic Shift

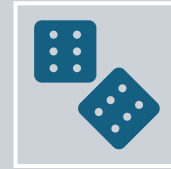
Today, ‘Artificial Intelligence’ is applied more broadly than in academia. It now generally refers to ***modern computational methods*** (e.g. machine learning, complex algorithms, and neural networks) ***that produce ‘intelligent’ outcomes.***



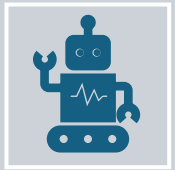
Potential AI Use Cases



Generative Design/Topology Optimisation: Lighter, more efficient structures.



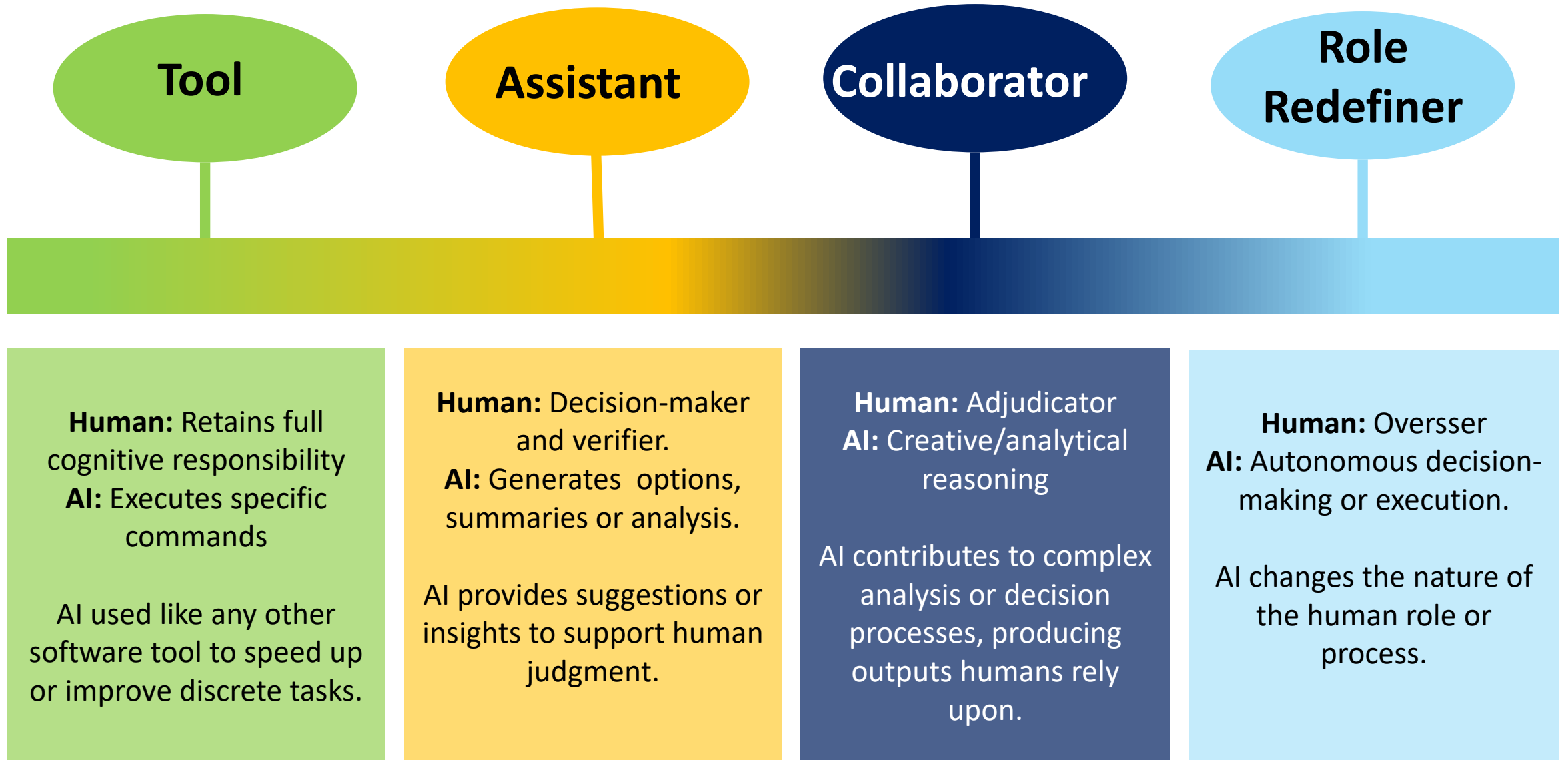
Predictive Modelling: Materials, fatigue life, maintenance.



Simulation & Digital Twins: AI-driven virtual testing.



Documentation / Analysis: AI assistance in reports, data validation and management.



AI Considerations Within Existing Obligations

Design Compliance

Robust, predictable, explainable results.

**Verification and
Validation**

Formal independent V&V by qualified persons.

**Personnel
Requirements**

AI literacy.

**Design Data Control/
Configuration
Management**

Data provenance; AI-influenced design outputs; AI-generated technical data.

**Safety Management
System**

AI-specific risks (bias, unpredictability, cybersecurity); fallback strategies and human decision points.

Potential Governance Considerations



Record training datasets , provenance and key parameters .	Record who ran the model, when , and for what purpose .	Record human review and sign off on AI-generated outputs.	Revalidate if model changes.
Specify which AI tool or model is used.	If AI informs a decision , record it explicitly.	Apply standard checks for errors, bias, quality and compliance .	Monitor human reliance and misuse .
Note the version and configuration .			Watch for model drift over time.

Potential HF Considerations

Risk Area	Example	Mitigation
Automation bias	Users over-trust AI outputs without independent verification.	Require dual validation — human sign-off and independent model check.
Algorithmic aversion	Users reject accurate AI outputs.	Increase transparency to show decision logic and allow human adjustment to maintain user agency.
Complacency / Skill fade	Reduced hands-on analysis weakens fundamental judgement.	Maintain “critical thinking” exercises in recurrent training.
Cognitive overload	Metacognitive and decision overload leads to cognitive offloading.	Human-centred design prioritising transparency and structured prompting for critical engagement.
Responsibility diffusion	“The tool suggested it” becomes a rationale for decision.	Reinforce accountability culture; establish clear decision chain back to humans.

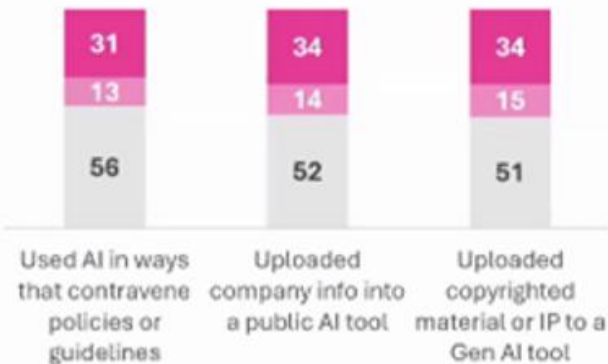
Use of AI at work is creating complex risks for organisations

1 in 2 augment organisational risk by flouting rules & policies

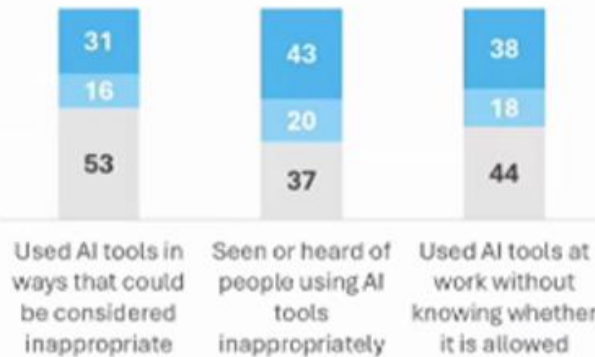
1 in 2 admit to inappropriate use of AI at work

2 in 3 over-rely on AI resulting in errors, unchecked outputs, and reduced effort

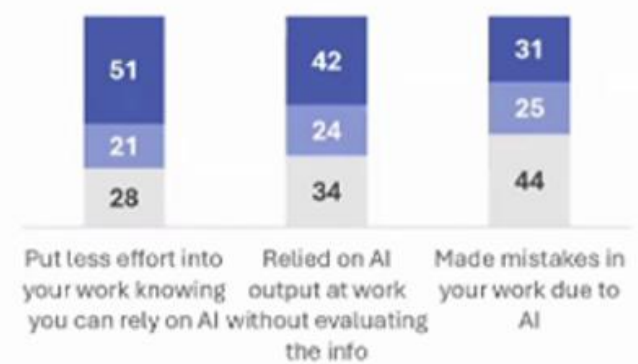
■ % Never ■ % Rarely ■ % Sometimes to very often



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■ % Never ■ % Rarely ■ % Sometimes to very often



3 in 5 'avoid revealing when they have used AI at work' and 'present AI generated content as their own'



48% are concerned about being left behind if they don't use AI at work

- **~67% of engineers** report informal AI/ML tool use in design/analysis. *PWC 2024*
- Most errors in AI-assisted decisions stem from **human, not AI failure**. *Harbarth et al., 2024.*
- Structured AI-literacy and Human Factors training **sharply reduce misuse** errors. *Narayanan et al., 2025.*
- Treat AI as another **design tool**, subject to your DAS, **not a magic solution**.



- “AI doesn’t replace human expertise — it reframes it. The future will depend less on whether we use AI, and more on *how intelligently we design the human–AI partnership.*”



Resources

- **EASA Human Factors Roadmap (2022)** — “Human-Centred Automation.”
- **FAA Human Factors Division (ANG-C1)** — research on automation trust and flight deck AI.
- **NASA Ames Human–Autonomy Teaming** studies.
- **ICAO Human Factors Panel** — upcoming work on AI interaction principles.
- **ISO/IEC 25059 (Quality model for AI systems)** — includes usability and human-centred evaluation.
- **EUROCAE WG-114** — developing AI trustworthiness metrics incorporating HF.
- Melbourne School of Business