

Taking a Human Centred Design Approach

TO INTELLIGENT ROBOTS IN THE WORKPLACE

Dr Meg Tonkin



Image Source: <https://www.industr.com/en/collaborative-robots-end-user-industry-insights-2284062>

**"The objects and people around us
influence our ability to participate."**

*Kat Holmes,
Director of Inclusive Design at Google*



Image Source: <https://www.kuka.com/en-us/future-production/human-robot-collaboration/cobots>

TAKING A HUMAN CENTRED DESIGN APPROACH TO INTELLIGENT ROBOTS IN THE WORKPLACE



1. What are Intelligent Robots?
2. What is Human Centred Design (HCD)?
3. Why is HCD a good fit for Intelligent Robots?
4. How would you use HCD in your workplace to implement Intelligent Robots?

WHAT ARE

INTELLIGENT ROBOTS?



WHAT ARE INTELLIGENT ROBOTS?

- Takes in input via sensors or Artificial Intelligence (AI)
- Makes choices
- Takes actions



COBOTS



Image Source: <https://www.universal-robots.com/blog/how-the-e-series-cobots-integrate-easily-into-modular-robot-cells/>

WHAT AI TECHNOLOGY IS USED?

- Face detection & recognition
- Speech recognition & conversational AI
- Vision System
- Motion Planner
- Task Planner



WHAT IS

HUMAN CENTRED DESIGN?



A background image showing two industrial workers wearing yellow hard hats and safety glasses. They are in a factory environment, with a robotic arm visible on the left. In the foreground, a welding process is taking place, creating a bright orange and yellow spark. A semi-transparent dark grey box is overlaid in the center, containing white text.

“Human-centred design is a framework that considers human perspectives throughout the design process.”

Francesca Sciandra

WHAT IS HUMAN CENTRED DESIGN?



- A creative approach to solving design and management problems by involving the people you are designing for **throughout the process**, to ensure you're developing solutions that are truly specific to their needs and goals.
- It is an **iterative practice** that makes continuous feedback a critical part of how a solution evolves.

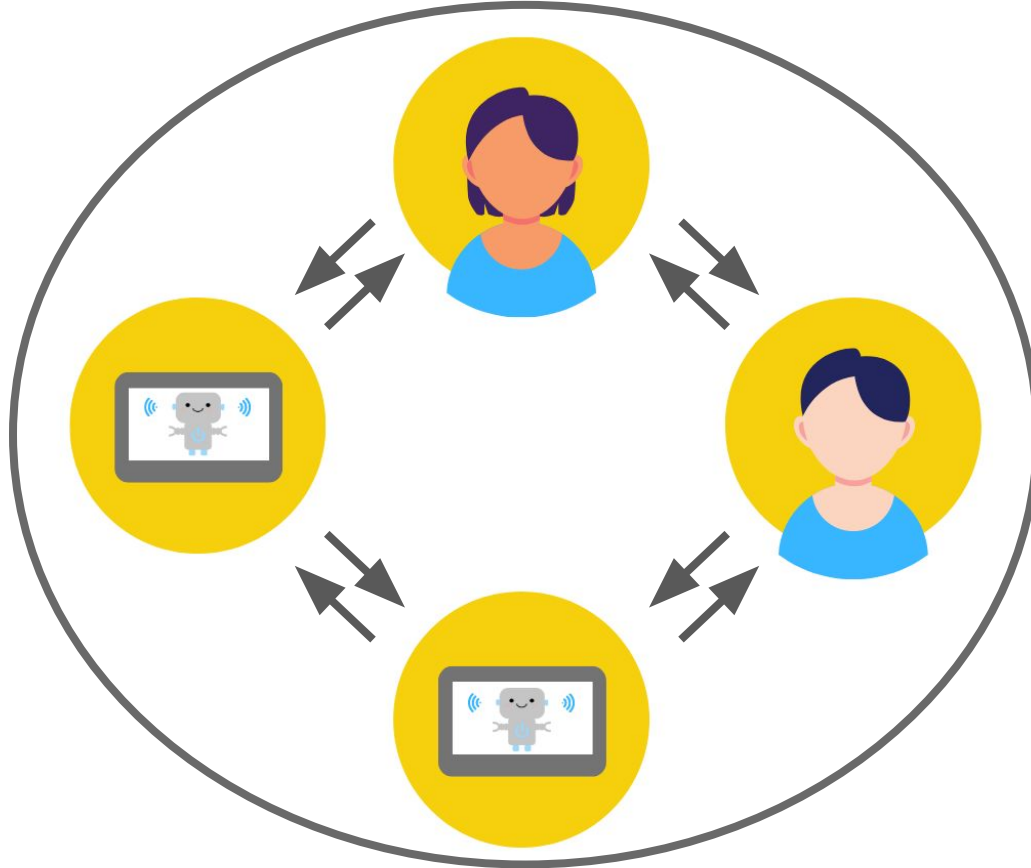
HUMAN CENTRED DESIGN



WHY IS HUMAN CENTRED
DESIGN A GOOD FIT FOR
INTELLIGENT ROBOTS?



WHY IS HCD A GOOD FIT FOR INTELLIGENT ROBOTS?



WHY IS HCD A GOOD FIT FOR INTELLIGENT ROBOTS?



- Considers both the technological and social aspects of a integrated interactive system
- Actions are orientated towards creating a preferred future
- Everyone benefits

WHY IS HCD A GOOD FIT FOR INTELLIGENT ROBOTS?

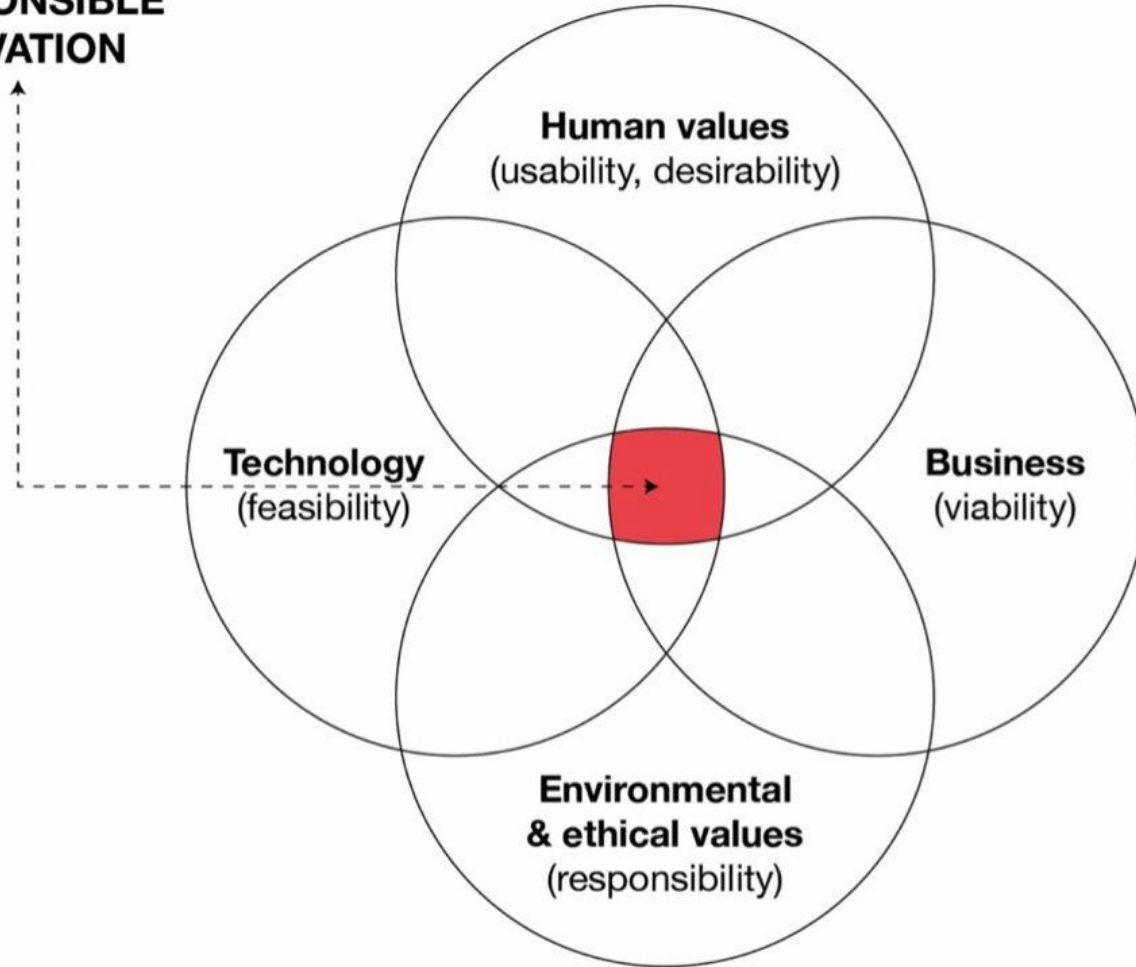


- Continuous improvement mindset
- Test fast, test often, test quickly
- Proven solutions that everyone wants and needs
- Holistic approach includes environmental considerations and sustainability

RESPONSIBLE INNOVATION & INDUSTRY



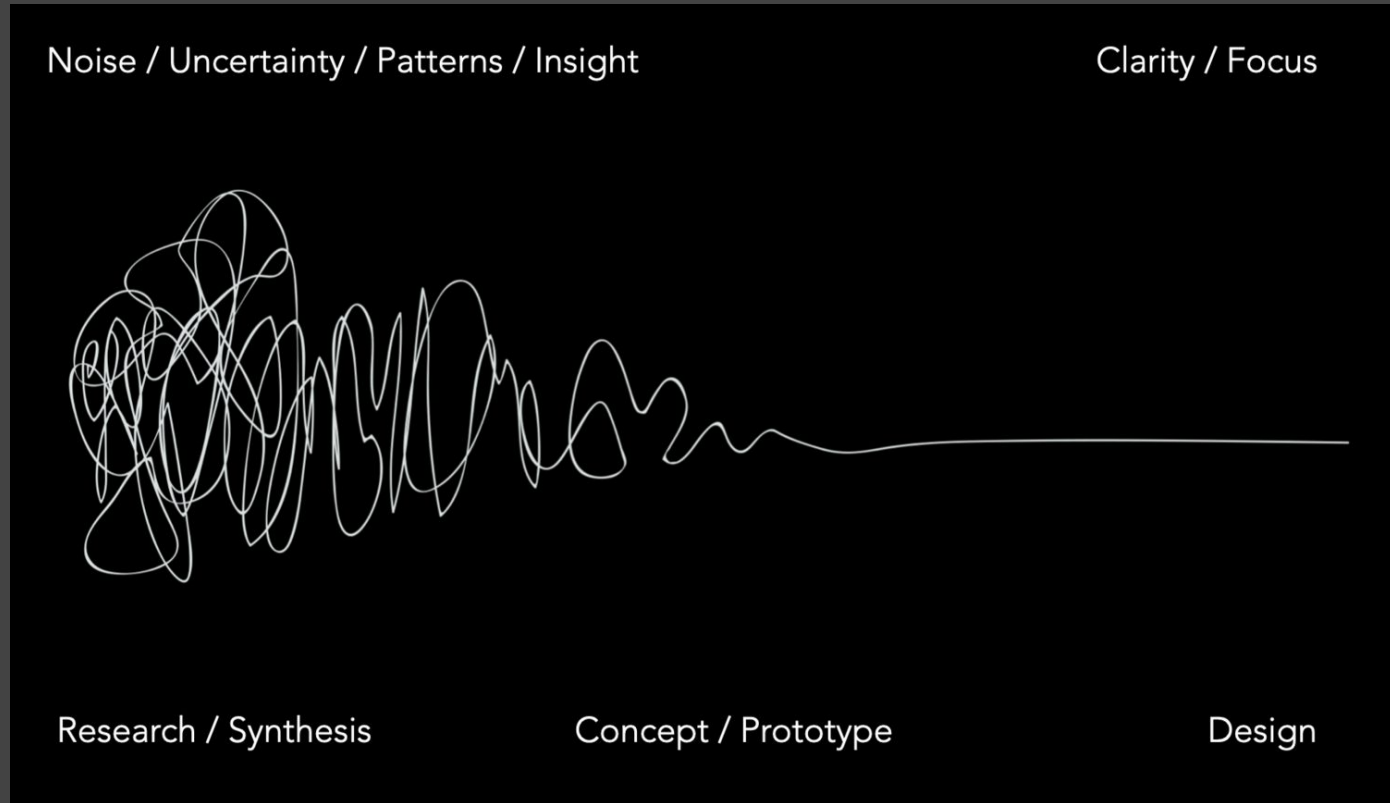
RESPONSIBLE INNOVATION



HOW TO USE HUMAN CENTRED DESIGN TO IMPLEMENT **INTELLIGENT ROBOTS?**



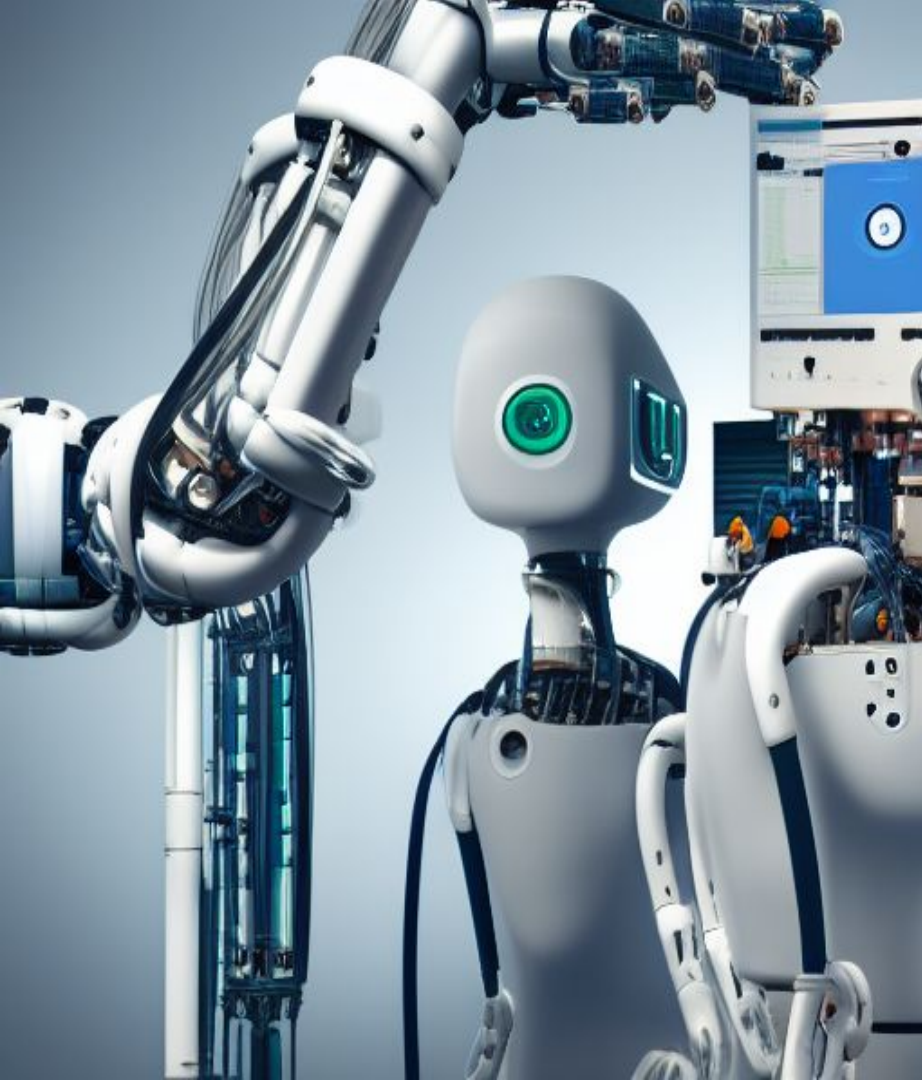
THE DESIGN PROCESS





CASE STUDY

- Sydney International Airport
- **Environment:** Departure Lounge
- **Stakeholders:** Passengers, flight crew and air flight staff, ground staff and security
- Insights & Opportunities
- Prototype Design
- Outcomes



DESIGN PRINCIPLES

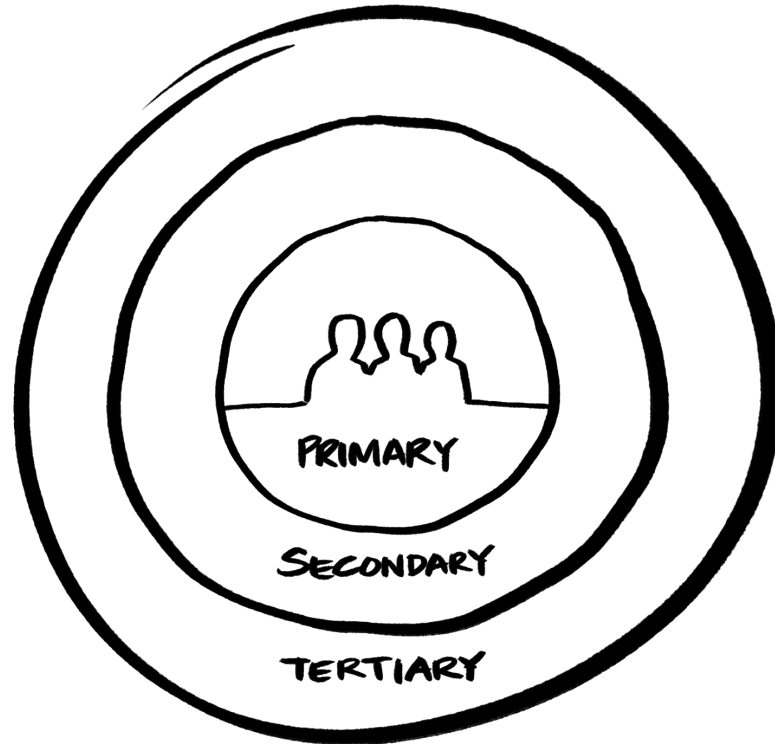
- Start broad
- Focus design on key areas
- Determine what **not** to change
- Make build-orientated prototypes
- Involve People
- Start Movements

START BROAD



- Who are the stakeholders?
- Research peoples' needs
- Semi- structured interviews
- What are the requirements for the future system, product or service?

5 MINUTE EXERCISE: STAKEHOLDER MAPPING



RESEARCH SYNTHESIS

- Insights
- Themes
- Pain Points
- Opportunities



FOCUS DESIGN ON KEY AREAS



MAKE PROTOTYPES



- Ideation, concept or co-design workshops to identify the best solutions for the scenario
- Prototyping (paper, role play, in-situ wizard of oz)
- Stakeholder involvement throughout
- Success measures
- Outputs with implementation in mind

START MOVEMENTS



- Multi-disciplinary approach
- Purposeful framework that incorporates the psychology of how people are motivated and learn
- Excites employees to learn and problem solve in groups

QUESTIONS

