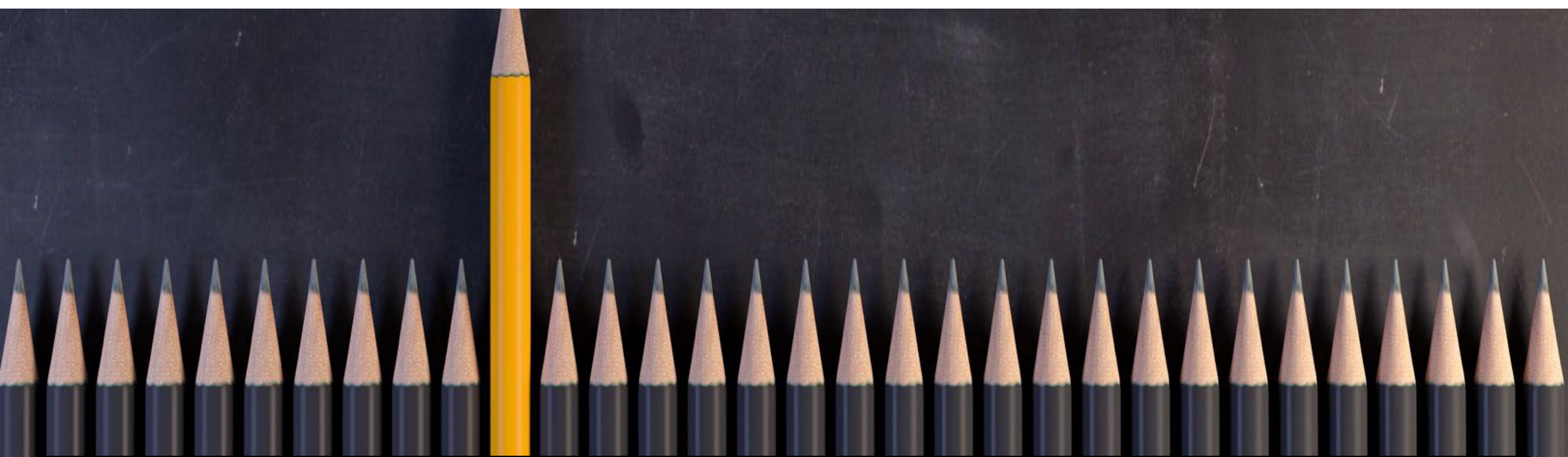
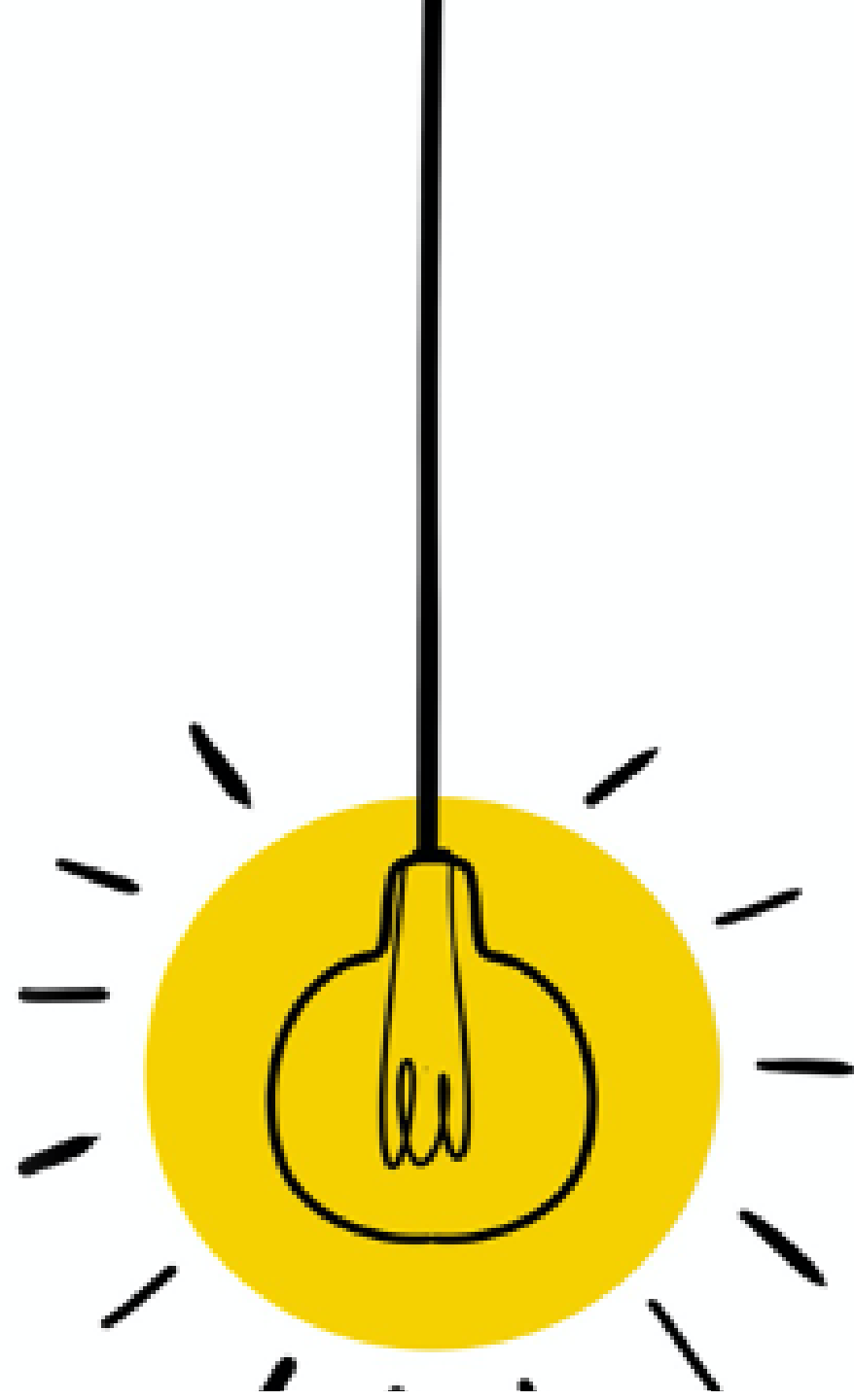
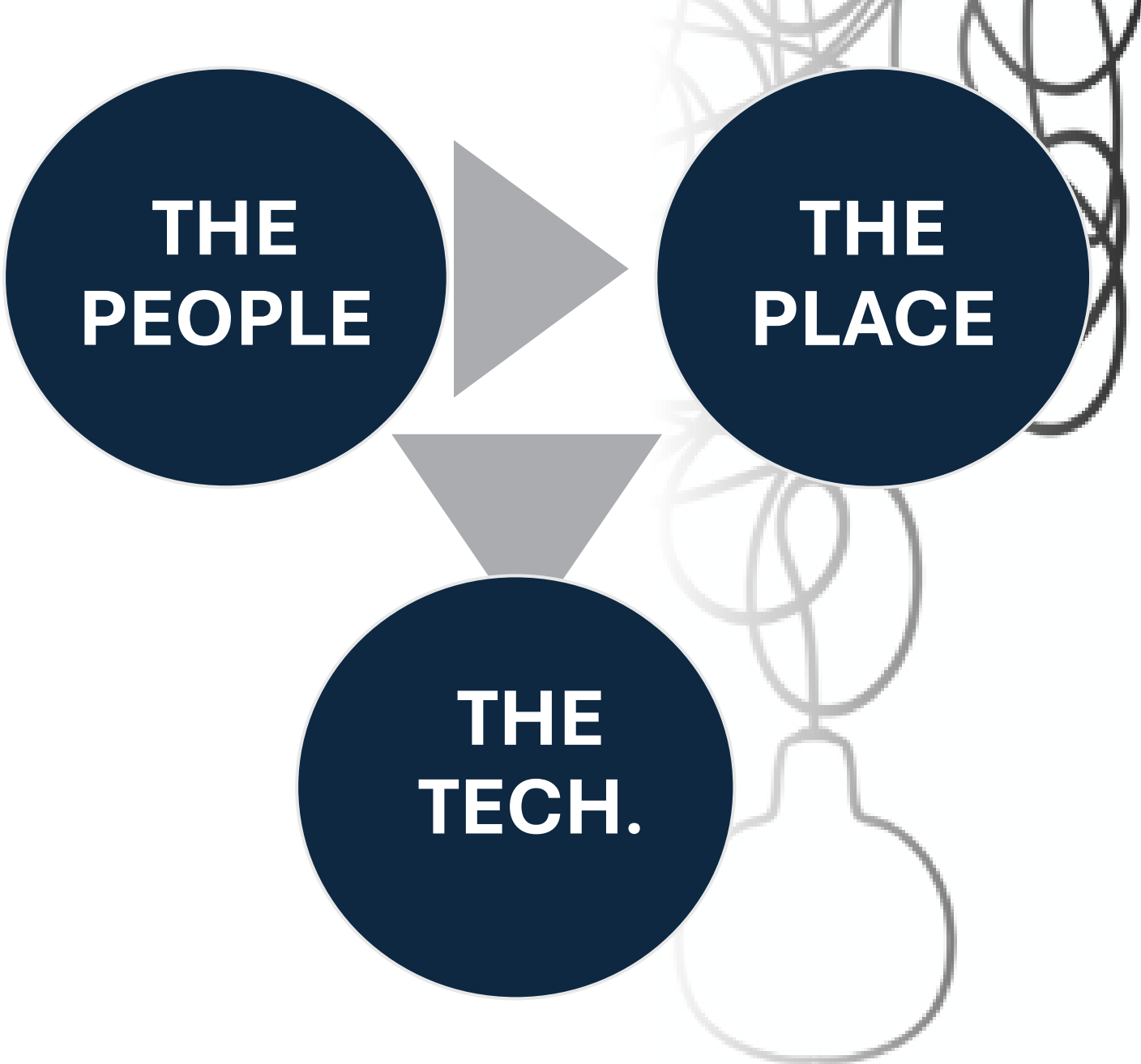




**From Strategy to Impact:**  
***Turning Bold Ideas into Real-World Innovation in  
Design, the Built Environment, & Robotics***

**Professor Evonne Miller**

*Professor of Design Psychology & Director, QUT Design Lab  
QLD Health Research Chair in Healthcare Design (2024-2025)*



**Resident Timeline: 2.6 years – 913 days –**  
in their aged care residence before their death

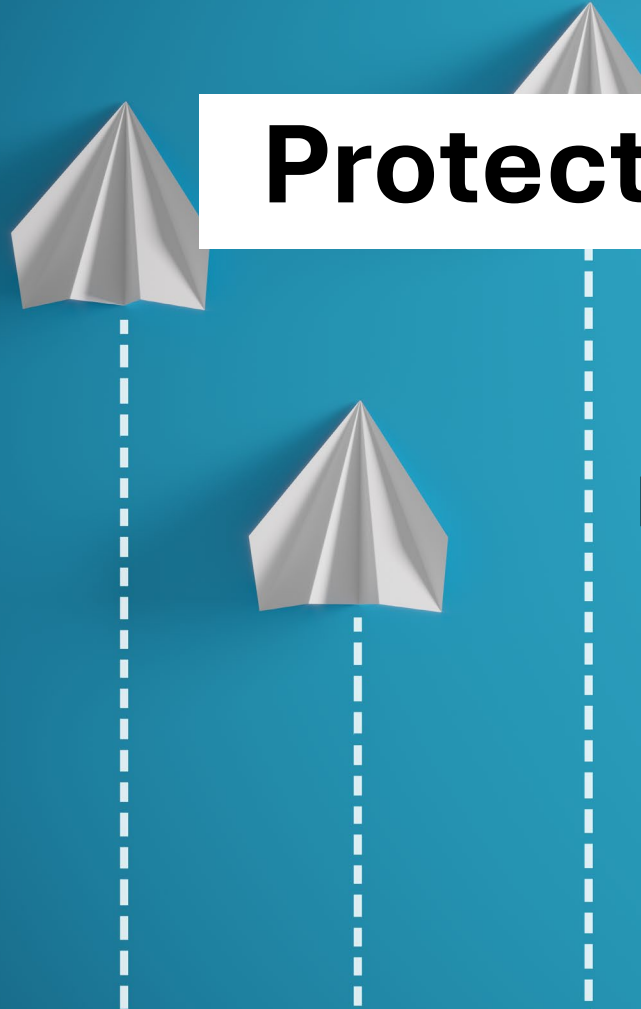
[—————] *913 Days of Life, Connection, History*

**Staff Timeline: 37% Annual Turnover**  
= 1 in 2 staff gone before the resident

[————] [ ] [————] [ ] [——] [ ] [————] *The Flicker Effect*

## **The Continuity Challenge in Aged Care**

**reality: residents and leaders live in a permanent state of "onboarding" new carers**



# Protecting our Institutional Intelligence

**Technical Debt:** *Every "flicker" takes away the training we just invested in*

**Relationship Debt:** *Staff, residents and families lose a person who "gets" them / their loved one*



**The Solution:** We need to design aged care facilities **people want to work in** (culture, tech, architecture,) and design **systems that hold wisdom** - even when people move on

# INNOVATION SOLUTION 1 THE PLACE



Intergenerational  
Contact Zones  
/ Co-Location



Playable Design



Sustainable & Biophilic  
Design

**What if we made aged care the most  
*architecturally* exciting place  
to visit, live, and work?**

## (1) re-design aged care urban form as *intergenerational contact zones*

- ‘**Old People Homes for 4 Year Olds**’ -  
*Australian Institute for  
Intergenerational Practice*
- NHMRC Grant – **GrandSchools**:  
*A new model for healthy **senior living**  
and integrated **school communities**  
across urban and regional Australia*

Trotter, M, Sanders, P, Lindquist, M, Miller, E, Hajirasouli, Aso, Blake, A, Harrington, Olsen, H., Tyvimaa, T., Pepping, G., Kuys, S. & Drogemuller, R.(2022). Intergenerational living and learning: The value and risks of co-locating retirement villages on secondary school campuses - Evaluating the GrandSchools vision. *Australasian Journal on Ageing*, 41(3).



## (2) re-design aged care urban form to be **connected to community**

**think strategically about place:**

*the features & activities the local community might value*

- Childcare / high school?
- Community Gardens
- Libraries
- Makerspaces
- Men's Sheds
- Galleries / Art Spaces
- Community Wellness / Medical
- Theatres / Auditoriums
- Social Enterprises

### ON THE GROUND EXPERIENCE:

*“historically, what the organization had done was we had turned our back onto our community and our neighbors”.  
Even a simple thing, like removing the fence that separated the site from the community was challenging: while it aligned with best-practice urban design, residents worried about security. And sharing green space access with nearby school and childcare took years to negotiate”*

Simply by choosing to reside in an aged care facility designed with sustainable, regenerative and biophilic design principles in mind, older people's residential choice might positively impact the world - positively enriches their own life and **'also the lives of others – from next door neighbours to people living on the other side of the globe'**

(p. 193., Chmielewski & Hoglund, 2018 )

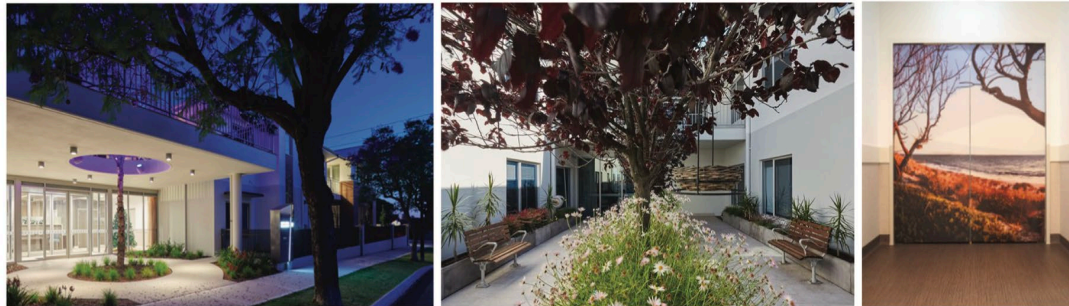


**Figure 3.** The Koh-I-Noor Nursing Home: Landscaped external balconies and internal courtyards, and integrated artwork of peaceful landscapes Photographer: Douglas Mark Black and Unknown.

### (3) Re-design aged care with **sustainable and biophilic design** principles

## (4) Re-design aged care with **playable design** principles – a place for joy

think strategically about embedding  
**PLAY, JOY, SURPRISE + INTERACTION**  
into everyday design experience

- **Interactive environments** – musical walls, sensory corridors, lighting
- **Playable public spaces** – swings, ping pong tables, playful seating
- **Movement-based design** – walking loops, bike tracks, active pathways
- **Nature + play integration** – water features, sand, gardens to touch & shape
- **Digital play** – gentle games, projection-based interaction, social tech
- **Micro-moments of joy** – playful handrails, textured walls, surprise



INNOVATION  
SOLUTION 2  
THE PEOPLE



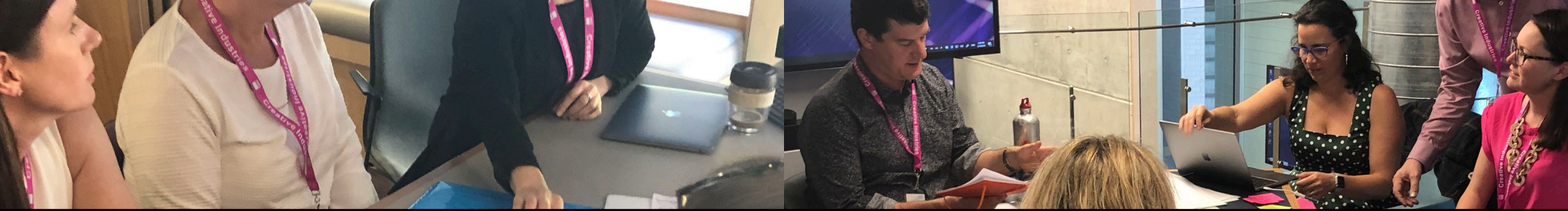
**What if we transformed the culture & work of aged care -  
*to make it the most exciting place to visit, live, and work?***

**HOW? Use co-design,  
design-thinking and  
imaginative storytelling to  
take people on a *positive,  
exciting journey of change***

*“only in theory does organizational  
change happen by drawing up a  
project plan and implementing it”*

*p.108, Salmi & Mattelmäki, 2021; CoDesign.*

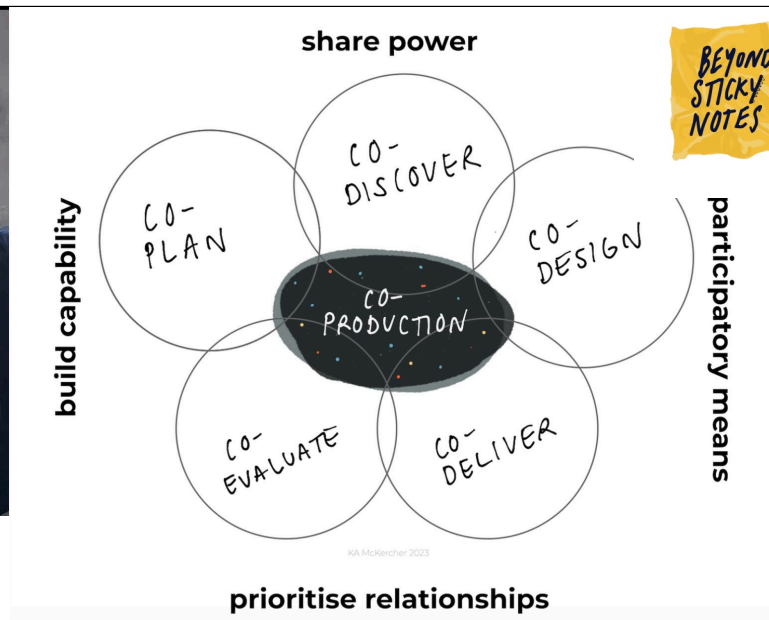




# 1. Co-design: whatever the challenge, the wisdom is the system – actively engage people to co-design, imagine & implement the solution(s)!



K.A. McKercher (2020). *Beyond sticky notes: co-design for real - mindsets, methods and movements*. Beyond Sticky Notes.



# STEERING OUR SHIP, USING THE WINDS, AND NAVIGATING HAZARDS, WITH INTENTION

"THE WISDOM IS IN THE SYSTEM"

*What gives us some wind at our backs...*

## THE WINDS...

1. What is our unfair advantage, our unique value proposition?
2. What are some radical or unexpected options that might help?
3. If there were no constraints, what would you do?
4. Which way forward is the most exciting?

## EXAMPLE: CO-CREATION / CO-PRODUCTION OF STRATEGIC PLAN



### ANCHORS, HAZARDS, CLIFFS & ICEBERGS...

1. List the key obstacles...



*What hold us back...*

2. To overcome these, what do we need to (i) Stop doing / do less of: and (ii) Start doing / do more of?



### BOLD STEPS

The big steps towards your vision

5. \_\_\_\_\_
4. \_\_\_\_\_
3. \_\_\_\_\_
2. \_\_\_\_\_
1. \_\_\_\_\_



## IN SMALL GROUPS

1. List your vision, and **ONE key priority to map**
2. Complete the canvas, listing: winds, anchors & bold steps..
3. Present back
4. Map next priority (if time)

**ANCHORS:** What doesn't work so well and slows us down - but is changeable?

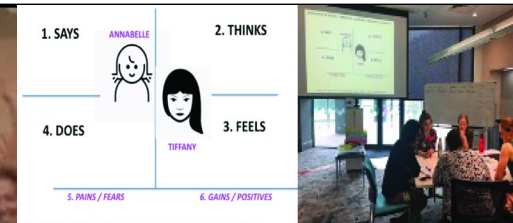
**CLIFFS:** What are the hazards and risks against which the team has no power (e.g. market, new tech, competitors)?

**ICEBERGS:** visible and hidden challenges



## 2. Use the tools of design-thinking to surface innovative solutions & normalize a culture of innovation!

OPEN INNOVATION: <https://research.qut.edu.au/design-thinking-sprints/>



1. SAYS  
- loves music  
- agreeable (ie not questioning)  
- being friendly, nice)

2. THINKS  
- mortality  
- different from peers  
- no one understands  
- he must do well  
- thought loop of what-didn't do well  
- manage her parents.

4. DOES  
- gym/band  
- not sleeping  
- social avoidance  
- high achiever/perfectionist

3. FEELS  
- Resigned  
- extremely anxious  
- worried



# Design Thinking for Creative Innovation

1

## EMPATHISE

use empathy to understand;

2

## DEFINE

bring clarity and focus to the design process, crafting a meaningful and actionable problem statement;

3

## IDEATE

collective minds brainstorm multiple creative ideas;

4

## PROTOTYPE

create low-fidelity (quick, easy, low-cost) prototypes to elicit feedback from users and colleagues;

5

## TEST

share and test your prototype with users; what works and what doesn't?;

6

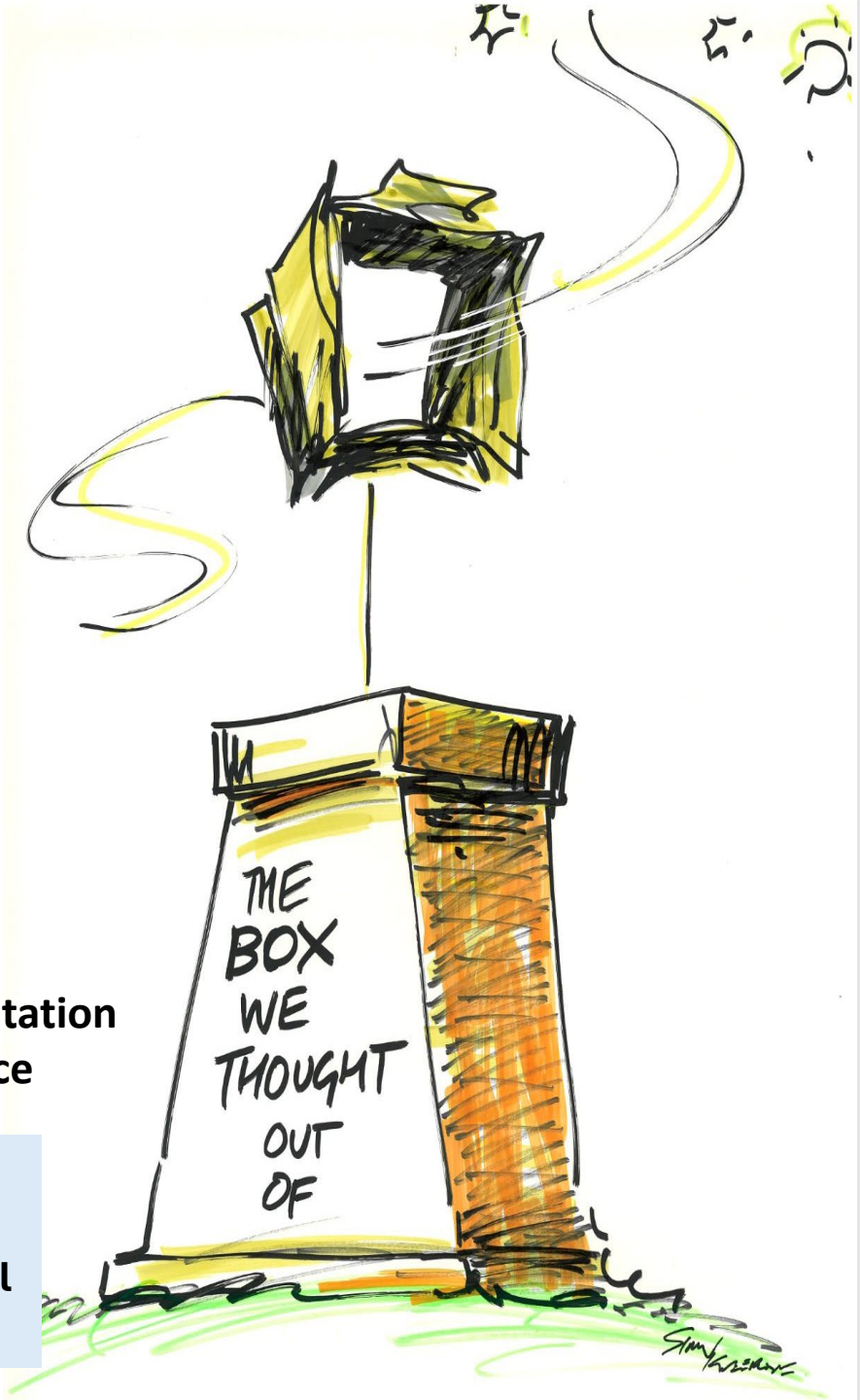
## IMPLEMENT

implement the vision.

BAU

Implementation  
Science

**DT - done well - leads to innovative solutions; but** innovation on its own is not enough. We need insights **implementation science**—*the structured process of actually embedding change into practice* – because: **innovation doesn't (always) fail because it's a bad idea - it fails because it's poorly implemented**



# Change Needs Reflection and Magic Needs Intention

*Why do we do things we do?*  
**Care practices unfold & are  
shaped by unseen past 'hands  
and habits'... disruptive  
change & innovation requires  
reflection & intentionality**



# CO-DESIGN TOOL FOR (CHORE) ROBOTS IN AGED CARE

QUT Robotics & QUT Design Lab & aged care providers

## 1. Purpose

What is the short-term and long-term purpose of the robot? What problem does it address?



## 2. People, Roles and Relationships

Who does the robot interact with? Who are the primary users? Secondary users? What is the relationship with the users? Do they depend on the robot?  
E.g., Family, friends, carers, neighbours.

## 3. Activities, routines and tasks

When and how does the robot interact with the users? Does it have one or more functions? E.g., support physically or emotionally, mitigate health risks, respond to accidents, socialisation, grooming, exercising, reading, cleaning, mindfulness, eating, cooking, shopping, etc.

## 4. Physical form

How is it machine-like or more lifelike? Does it resemble an object, a person, or an abstract form? How small or big is it? Does it have any visual cues? What materials is it made of? What does it feel like?

## 5. Social behaviour and interactions

How does the robot communicate with the users? Does it use speech or sounds? What are its social skills? Does it collaborate with the users or serve them? Does it move freely or is it stationary? Does it communicate with other technology devices? What is the robot's name? Does it have a backstory and/or personality?

## EXAMPLE: CO-DESIGN A CHORE ROBOT FOR AGED CARE

**Co-design:** active collaboration between stakeholders in the design of solutions to a **pre-specified problem** eg co-design tasks & 'look of' CHORE ROBOT HELPII

## 6. Location and environment

Where is the robot located? What's around it? Where do the users interact with it?  
Is it stored somewhere?

## 7. Impact

How does the robot positively impact the context?

## 8. Ethical considerations and questions

What are some emotional and physical considerations?  
What are some concerns about the robot?



**IM POSSIBLE**

We need the positive,  
transformative power of  
co-design, design  
thinking and  
implementation science  
to address the wicked  
challenges facing us

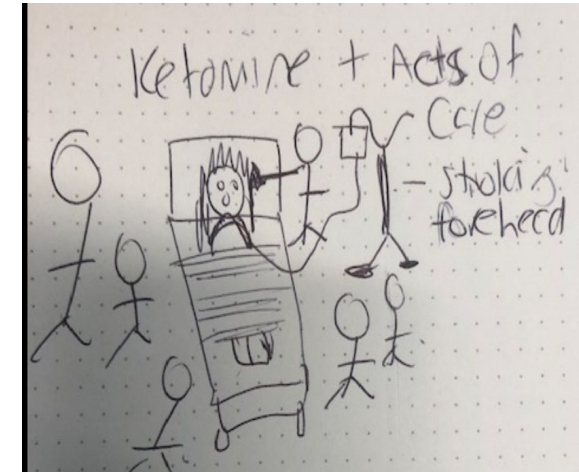
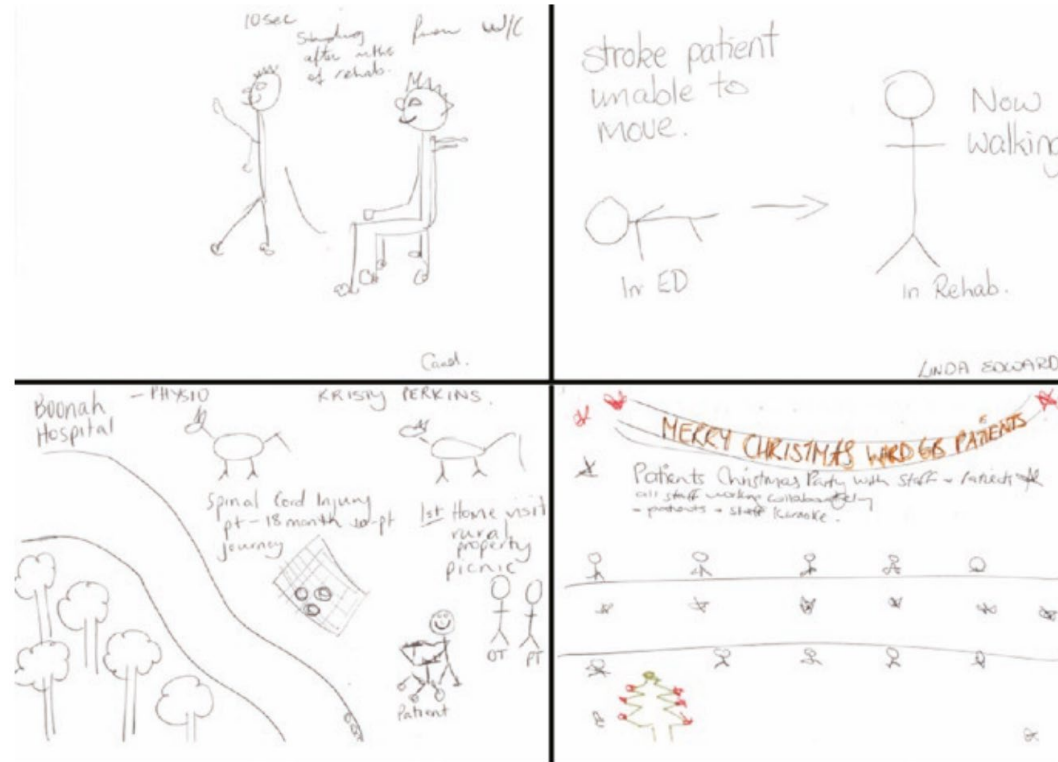
# How Designers Are Transforming Healthcare

Evonne Miller  
Abbe Winter  
Satyan Chari  
*Editors*

OPEN ACCESS

 Springer

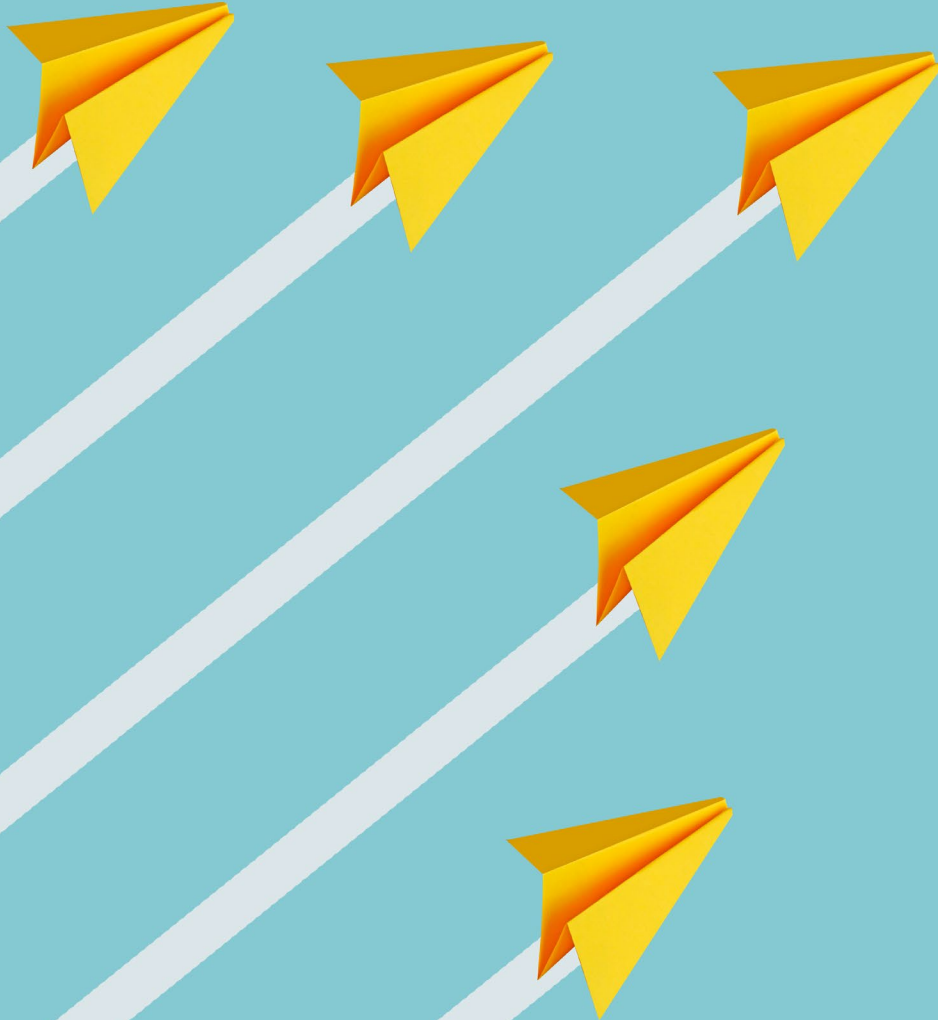
## ***Appreciative Inquiry Inspired Approach: Start Workshops by Sketching a 'Positive Work Moment'***



### **3. Support a culture innovation and learning with a mindset of *appreciative inquiry* and *positive organisational scholarship in healthcare (POSH)***

*instead of the traditional focus on problems and failures, POSH emphasizes "brilliance": positive outcomes, processes, and attributes that enable staff and organizations to thrive, even in challenging environment*

“A leader is a dealer in hope”  
—*Napoleon Bonaparte*



# **Innovation is Hard Because it Requires *Unlearning..***

*but with the tools of  
co-design, design  
thinking and  
appreciative inquiry,  
we can support the  
process of  
transformative  
innovation*

**“ The illiterate of the 21<sup>st</sup> century  
will not be those who can’t read  
and write, but those who cannot  
learn, unlearn and relearn. ”**

Alvin Toffler

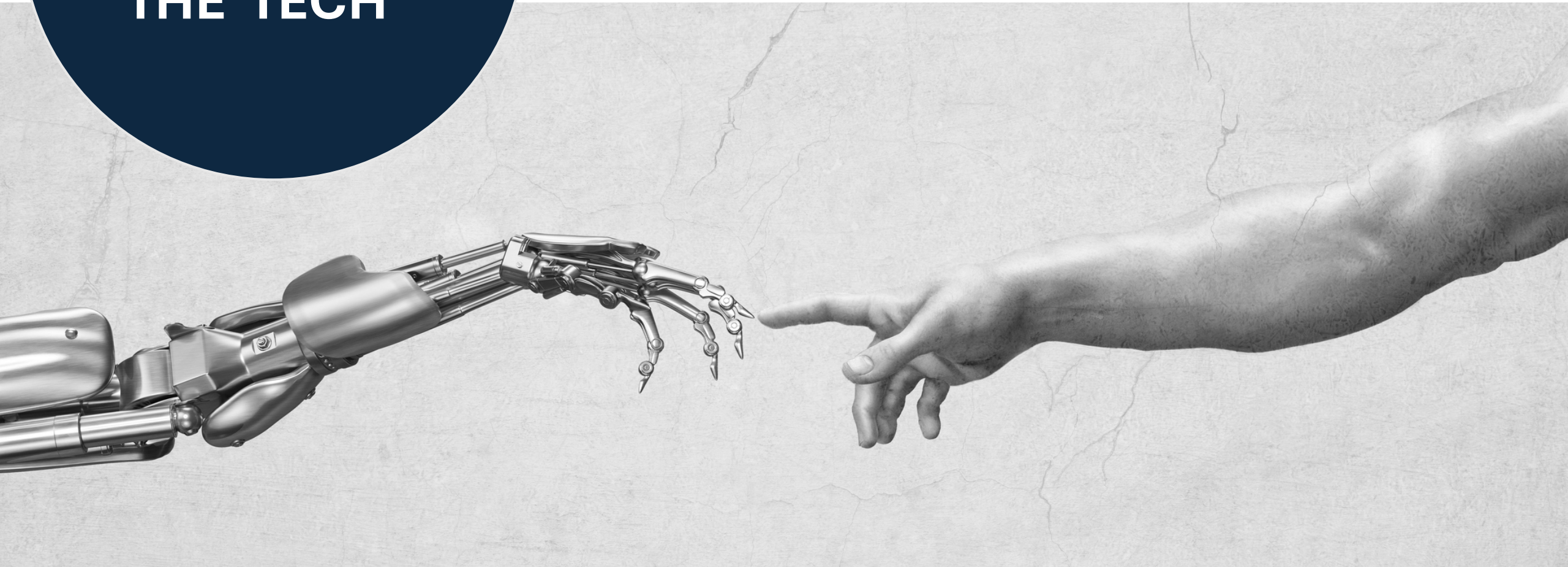
as a result of this  
*appreciative inquiry, co-  
design, design thinking*  
process people are  
transformed: not  
*“the same coming out as  
we were going in”*

Neal P & Neal C, 2011; also Jack  
Mezirow *Transformative Learning Theory* -  
profound change in perspective when individuals critically reflect on their  
beliefs and assumptions, often sparked by a "disorienting dilemma"

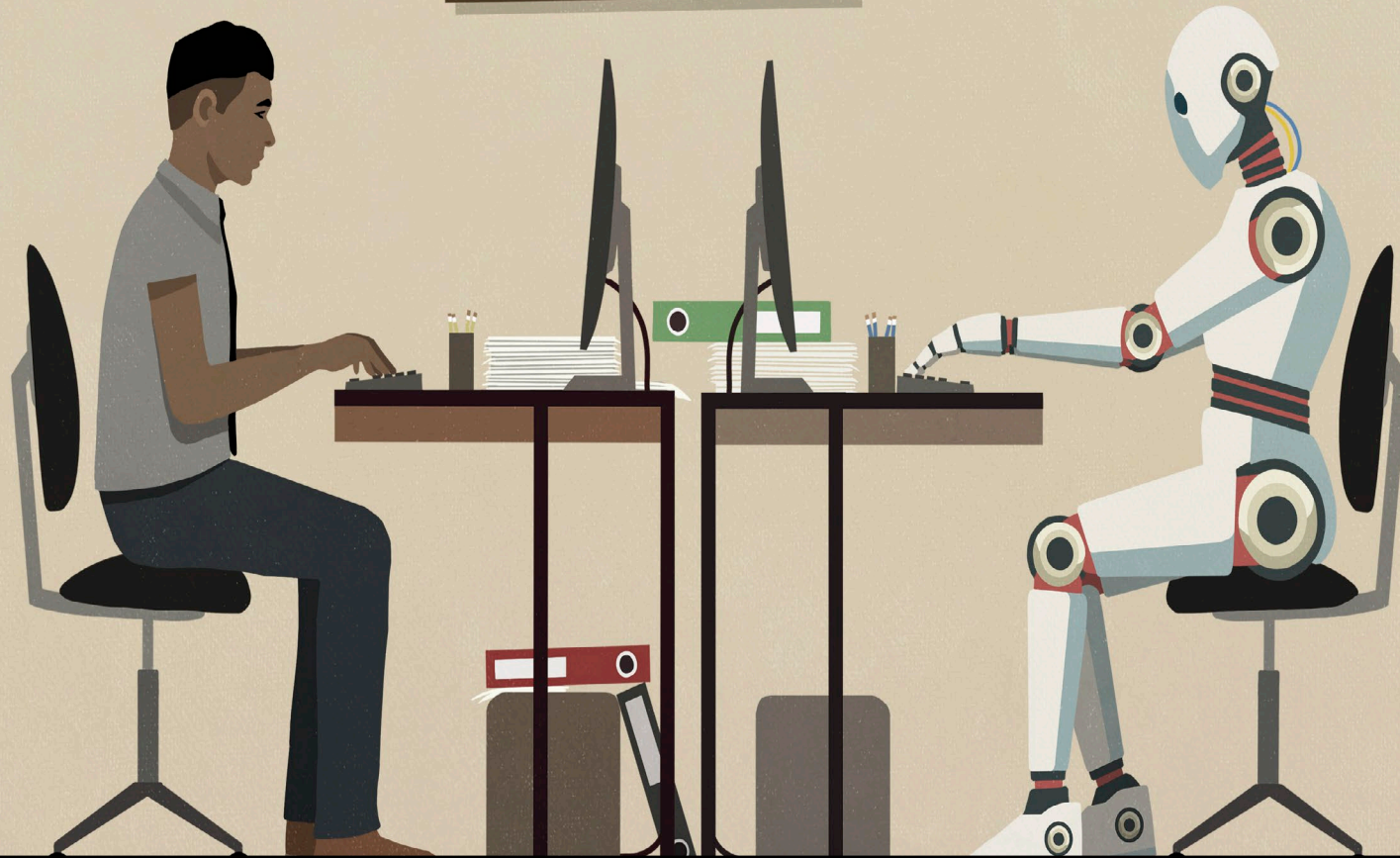


**INNOVATION  
SOLUTION 3  
THE TECH**

**What if we made aged care the most  
technologically exciting place to  
visit, live, and work?**



# What will robotics mean for the aged care workforce?



**WHAT IS A ROBOT...:**  
“information technology  
in a physical  
embodiment, providing  
customized services by  
performing physical as  
well as nonphysical  
tasks with a high degree  
of autonomy” (Jörling et  
al., 2019, p. 405)

**ANTHROPOMORPHISM:**  
how human-like it is  
(eg, face, arms, legs)

*How will technology will change healthcare, aged care & ageing in place?*

*Would you trust a robot to look after you? Why / why not – & what tasks? Robot-human ratios?*

# What could futurist aged care, run by robots, look like?..

**“The building is fully automated, staffed only by robots.** Robot sweepers polishers, and vacuum cleaners clean the floors. Residents are turned and lifted out of bed by the beds themselves, which can perform these actions either as a result of voice prompts from the resident, remote instructions, or pre-programmed schedules. Sophisticated wheelchairs with autonomous navigation capabilities move the residents around the facility, to the dining hall where pre-packaged meals are delivered to tables by serving robots, and to the showers, where something that looks like a cross between an octopus and a car wash bathes them carefully.

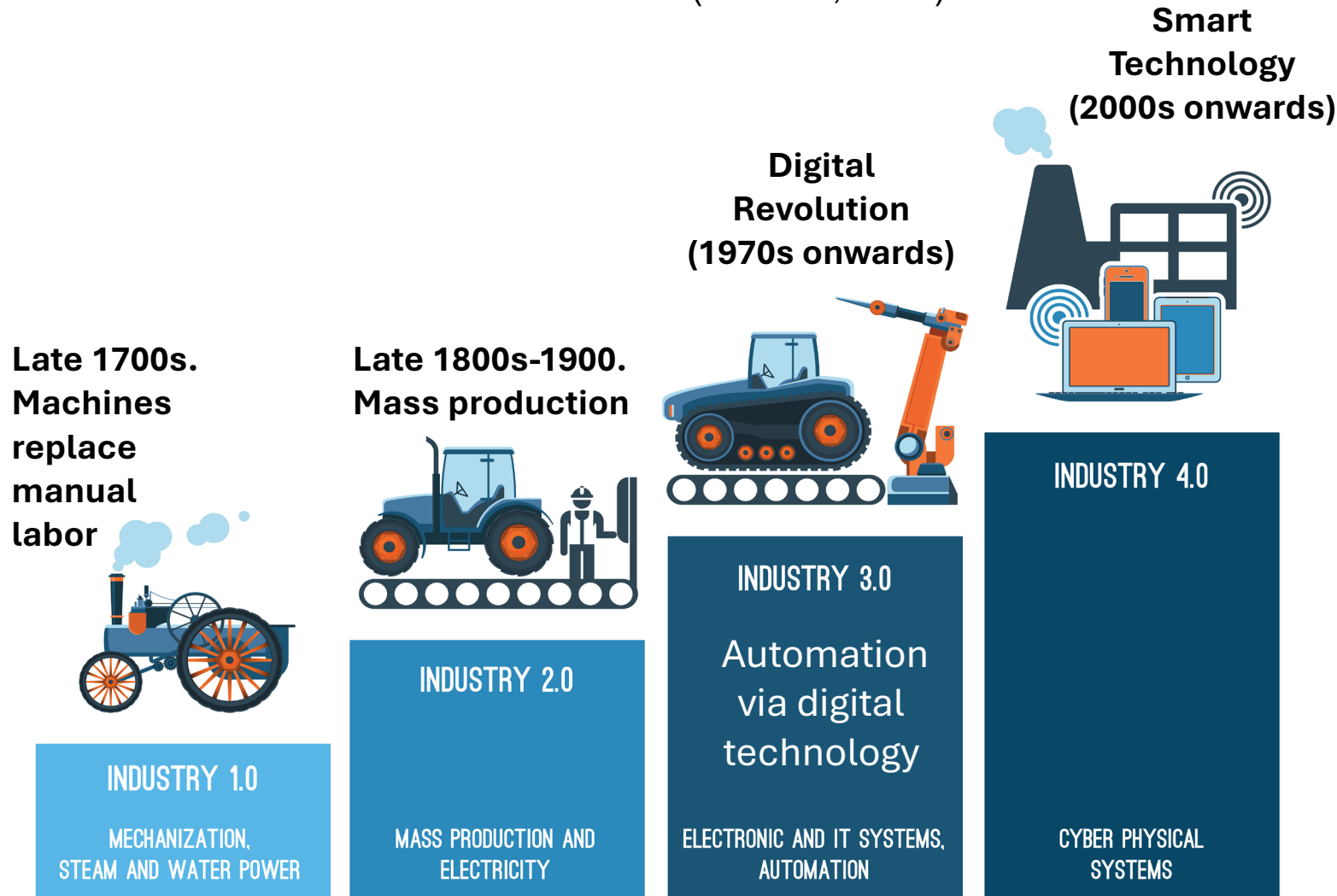
In the midst of all this robotic bustle, two robots in particular stand out: the telemedicine robot, which allows medical personnel situated in a call centre in India to diagnose conditions, prescribe and administer medications, and perform simple operations; and, the telepresence robot, which allows relatives to talk with and “visit” their parents and grandparents without leaving the comfort of their own homes.

One might expect that this building would be silent or disturbed only by the buzzing of the robotic vacuum cleaners. **In fact, it is filled with conversation and laughter as the residents talk to their robot companions, which have been programmed to entertain and converse with them in a never ending, if sometimes repetitive, stream of conversational gambits and chitchat. The residents – especially those whose medical records show they have dementia – seem happy. So effective are this facility’s operations that – apart from those it “cares” for – you are the first person to set foot in it for five years”**

**The future  
is now:  
*we are living  
through  
real-time  
transformation!***

***Industry 4.0  
/ Industry 5.0***

4<sup>th</sup> IR: the unprecedented fusion of emergent technologies across physical, digital and biological spheres that is changing the “what” and “how” of doing things, as well as “who” we are (Schwab, [2016](#))



# From Industry 4.0 → 5.0: What does this mean for care?

1970s

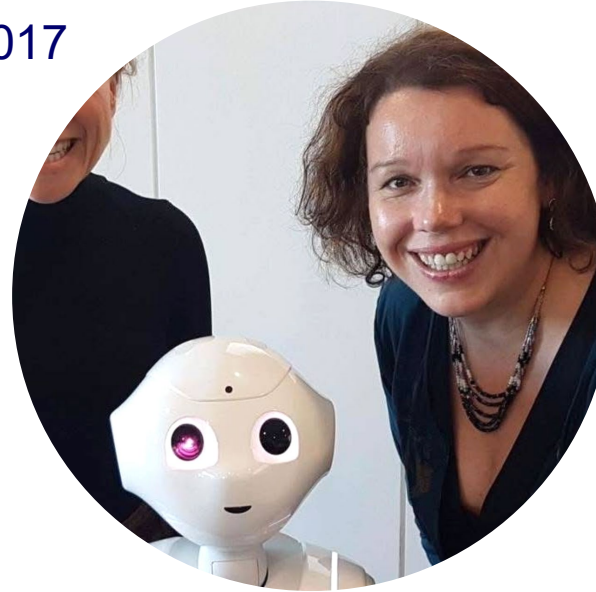


## Industry 4.0

### *Computing Revolution*

- Birth of the PC WWW, & dial up internet!
- DIAL UP TO DIGITAL

2017



## Industry 4.0

### *Smart Technology*

- AI & Robotics
- Automation
- Data-driven systems

2025



**QUT: Humanoids at Work Project**

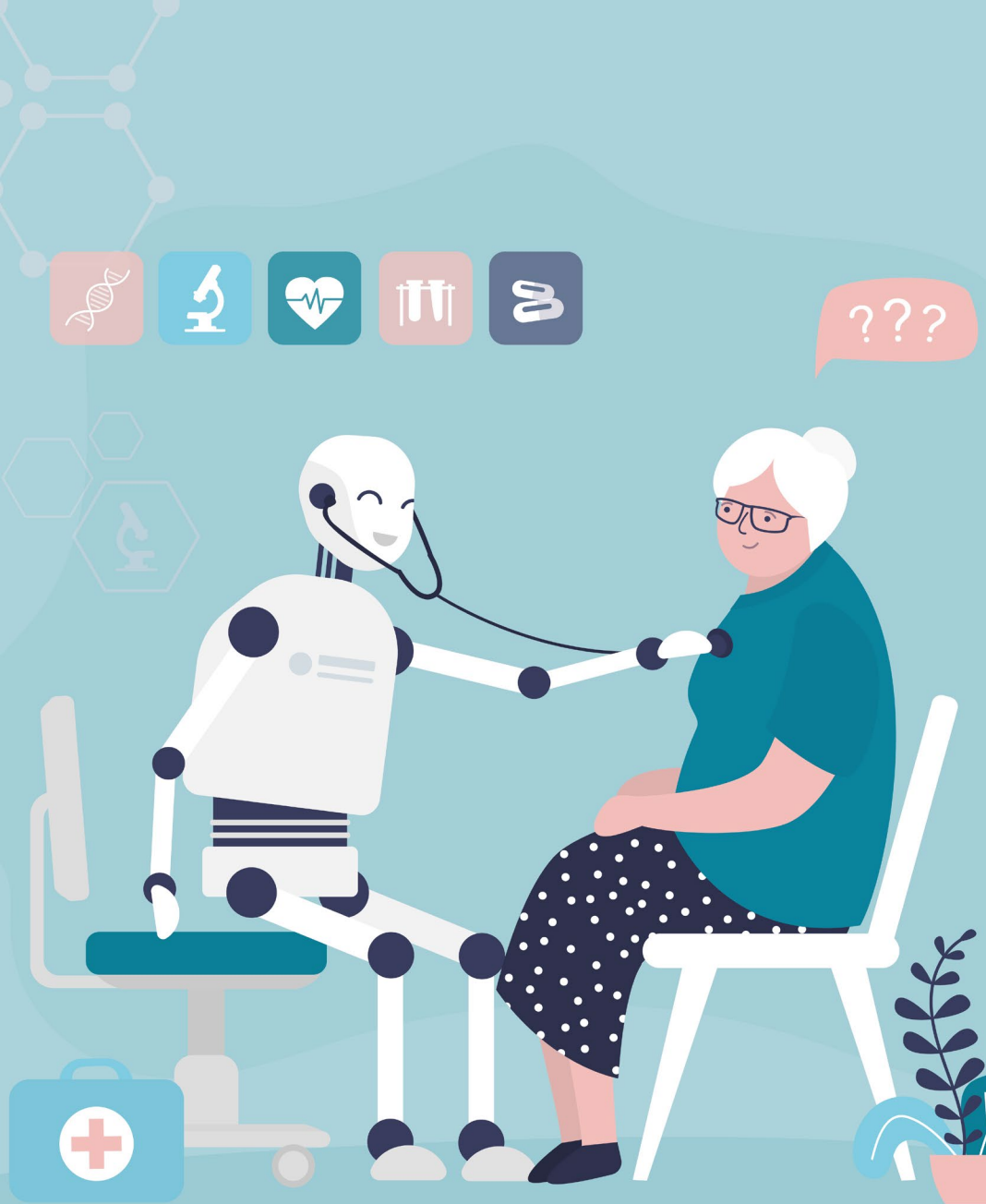
## Industry 5.0

### *Humanising Tech*

- Human + tech collab.
- Ethics & dignity
- Wellbeing-focused

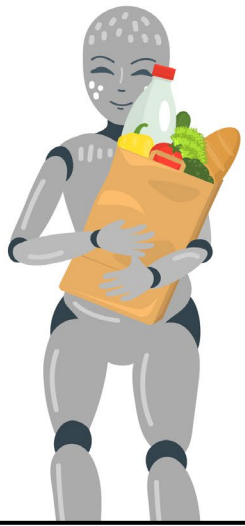
**Industry 4.0 built smart systems**

**Industry 5.0 puts humans back at the centre, humanising technology**



TQ:  
*Why do we talk so much about robots and older people, and so little about robots caring for children?*



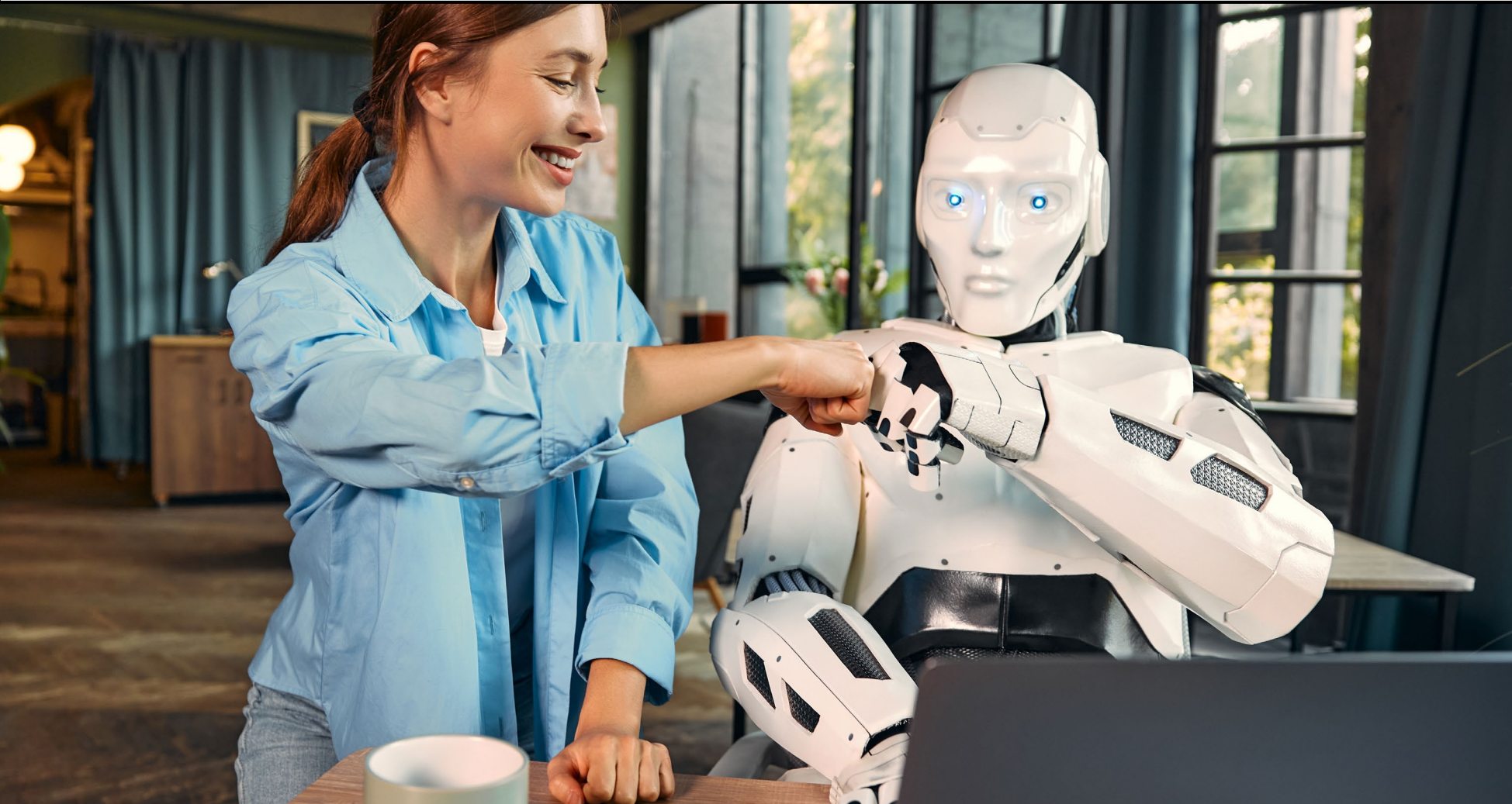


## Improving Job Quality: Removing “Worst Parts” of Care

*Robots can take over: Heavy lifting and transfers; Repetitive delivery/logistics tasks; Cleaning and routine monitoring.* Frees staff to focus on: **Relational, emotional, person-centred care.** Shift from **task-based work** → **meaningful caregiving role**



# Opportunity for New Roles and Career Pathways?



Robotics has potential to create **new hybrid roles**, with **upskilling opportunities for staff**: *Care + Tech Management (e.g., robot coordinators, digital care specialist). Data-informed care.*

**Professionalise & future-proof the workforce.**

- *Aged care is facing chronic staff shortages, high turnover, and burnout.*
- *Work is often physically demanding, emotionally taxing, and undervalued*
- *Robotics a response to unsustainable workforce pressures, not a replacement for care*

**BUT** successful adoption depends on engaging staff, residents, & stakeholders in a culture change process, supported by effective implementation strategies



## Chore robots



Figure 1. A RoboCart helping with transporting heavy lifting in a nursing home.



Figure 2. Roomba, a cleaning robot.



Figure 3. Moley, 2021. Moley Robotics Kitchen, a cooking robot.

## Companion robots



Figure 4. Shibata and Wada, 2010. Paro, the robotic seal for therapy and dementia. Considered the iconic robot companion.



Figure 5. Khosla and Chu, 2013. Matilda, an affective communication robot for emotional wellbeing support.



Figure 6. Intuition Robotics, 2017. ElliQ, an AI-powered social companion.

## Care robots



Figure 7. Riken and Sumitomo Riko Company, 2015. Robear: the bear-shaped nursing robot can lift patients.



Figure 8. Pollack et al., 2002. Pearl: A mobile Robotic Assistant for the Elderly to support physical activity.

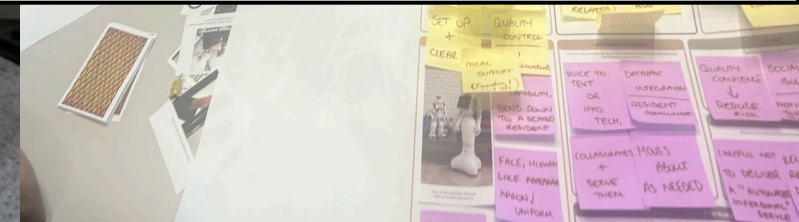


Figure 9. Bonani et al., 2018. What My Eyes Can't See, A Robot Can Show Me: Exploring the Collaboration Between Blind People and Robots.

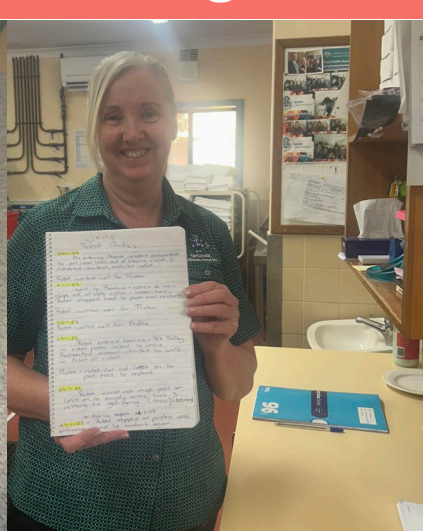
robots come in a variety of sizes and designs:  
**Social / Assistive Robot Typology for Aged Care:**  
**CHORE, COMPANION, & CLINICAL CARE**



The public - and esp. staff working closely with the robots - supported on a **robot learning journey**. Care staff not prepared, ready, or educated about how to work with robots, with most typically having high expectations shaped by mental models drawn from popular culture and science fiction. The reality – for **‘WORKING’ ROBOTS IN REAL AGED CARE SETTINGS (NOT COMPANION ROBOTS)** - is **NOT YET THAT**.



## 10 Robots @ Work in Aged Care – ‘Robot Antics’ ; Rude Robots; Give Way Signs



# CO-DESIGN TOOL FOR (CHORE) ROBOTS IN AGED CARE

## Hopes

What are your hopes for the future of robotics in aged care?

## Fears

What are your fears about the future of robotics in aged care?

Co-Design & Design Thinking Tool surfaces *Hopes, Fears, Myths, Taboos, Legends*

## Myths

What are some myths you know about robotics in aged care?

## Taboos

What are some taboos you know about robotics in aged care?

# The Co-Design Tool



Collaboration with QUT Robotics,  
to co-design HELPII, form & function

## 1. Activities, routines and tasks

*What does the robot do? When does the robot interact with the users? Does it have one or more tasks?*

### 1. Activities, routines tasks

*What does the robot do?  
When does it interact with  
users? How many tasks?*

## 2. Location and environment

*Where is the robot located? What's around it? Where do the users interact with it? Is it stored somewhere?*

### 2. Location & environment

*Where is the robot located?  
What's around it? Where do  
users interact with it?  
Storage?*

## 3. People, Roles and Relationships

*Who does the robot interact with? What is the relationship with the users? Do they depend on the robot?*

### 3. People, roles and relationships

*Who does it interact with?  
What is the relationships? Do  
users depend on the robot?*

## 4. Physical form

*What does the robot look like? Does it resemble an object, a creature, a human or is it abstract? What is its size?  
What materials is it made of? What does it feel like?*

### 4. Physical form

*What does the robot look  
like? Does it resemble an  
object, a creature, a human or  
is it abstract? Size? Materials?  
What does it feel like?*

## 5. Social behaviour and interactions

*How does the robot communicate with the users? Does it collaborate with the users or serve them? Does it move?  
Does it communicate with other devices?*

### 5. Social behaviour and interactions

*How does the robot  
communicate with the  
users and other devices?  
Does it collaborate or  
serve them? Does it  
move?*

## 6. Impact

*How does the robot positively impact the context?*

### 6. Impact

*How does the robot positively  
impact the context?*

## 7. Ethical considerations and questions

*What are some emotional and physical considerations? What are some concerns about the robot?*

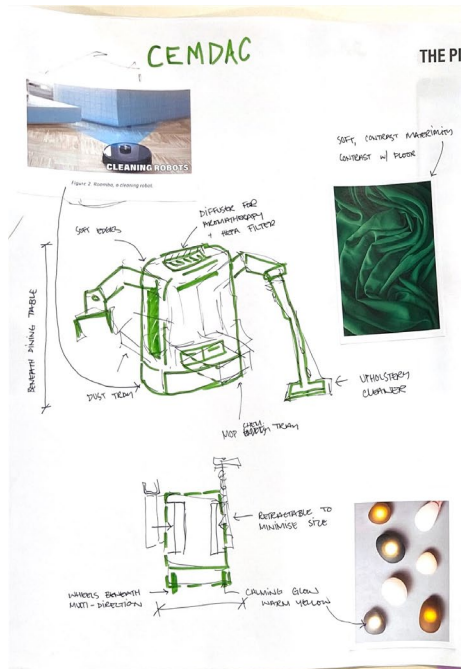
**7. Ethical considerations**  
*emotional/physical  
considerations? Concerns?*

## 8. How do you justify this robot to the board?

*What problem does it address? What benefits does it bring?*

**8. How do you justify this robot to the board?**  
*What problem does it address? What benefits does it bring?*

# Co-Designed Concepts



**CEMDAC**

SAFETY, CONTOUR, UNIVERSITIES

UNIVERSITY CHAIRS

HOP

**THE PITCH - HELPII RE-IMAGINED**

**THE GREEN, CLEAN, CLEANING MACHINE**

Robot name: **CEM-DAC**

What's the robot's gender, characteristics and/or personality? *cleaning, environmental friendly, diffuse (room), air filter + cleaner.*

What are the robot's priority tasks? *cleaning, monitoring, maintenance, changes, diffuse, air filter.*

What are the most important design considerations? *Green, Clean + Medicine + Renewable*

What is the business model? *Re Green, Clean, Cleaning Machine*

Notes or sketches: *talk to height to get value to ceiling, CEM-DAC, CEM-DAC*

**PITCH - HELPII RE-IMAGINED**

**Sadie**

What's the robot's gender, characteristics and/or personality? *professional, engaging, fun.*

What are the robot's priority tasks? *cleaning, general areas, routine, 3x day, all corners, offices, rooms, infection, air-purification + smell.*

What are the most important design considerations? *Residents to help design.*

What is the business model? *lease/monthly*

Notes or sketches: *music? John Farnham! pick up things, vacuum, dust, fan, microphone, clean.*



**Robot name: Speedy x3**

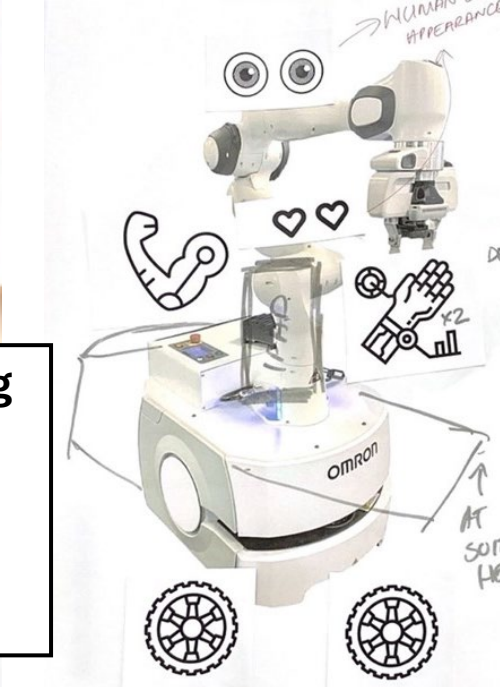
What's the robot's gender, characteristics and/or personality? *long - it's doing things I can't do for myself anymore, I don't want it to stand out*

What are the robot's priority tasks? *collecting laundry, transferring to machine, tending machines on, folding, re-labelling, returning to rooms*

What are the most important design considerations? *Inconspicuous, quiet, small, durable, reliable, maintain, autonomous, based on schedules but able to be overridden*

What is the business model? *more cost effective than a staff member ~ 130k a year 7 days/week*

- The 'Green, Clean, Cleaning Machine'; 'Sadie'; 'Speedy x3' – cleaning, air purifier, infection control
- Cookie/Foodii



**Robot name: COOKIE / FOODII**

What's the robot's gender, characteristics and/or personality? *YOUR FRIENDLY CATERING COMPANION. GENDER NEUTRAL*

What are the robot's priority tasks? *- MENU ORDERING - DELIVERY / CLEAN UP - QUALITY CONTROL*

What are the most important design considerations? *EASY TO MANOEUVRE, MULTIFUNCTIONAL, VISUAL + VOICE INTERACTION CAPABILITIES.*

What is the business model? *QUALITY + COMPLIANCE, REALLOCATION OF WAITING RESPONSIBILITIES, MINIMIZATION, ↑ DINING EXPERIENCE*

Notes or sketches: *COLOUR - STIMULATE APPETITE, COLOUR CONTRAST ON LIMBS TO HELP RESIDENTS IDENTIFY PARTS OF THE ROBOT THAT CAN BE HANDLED BY THEM.*

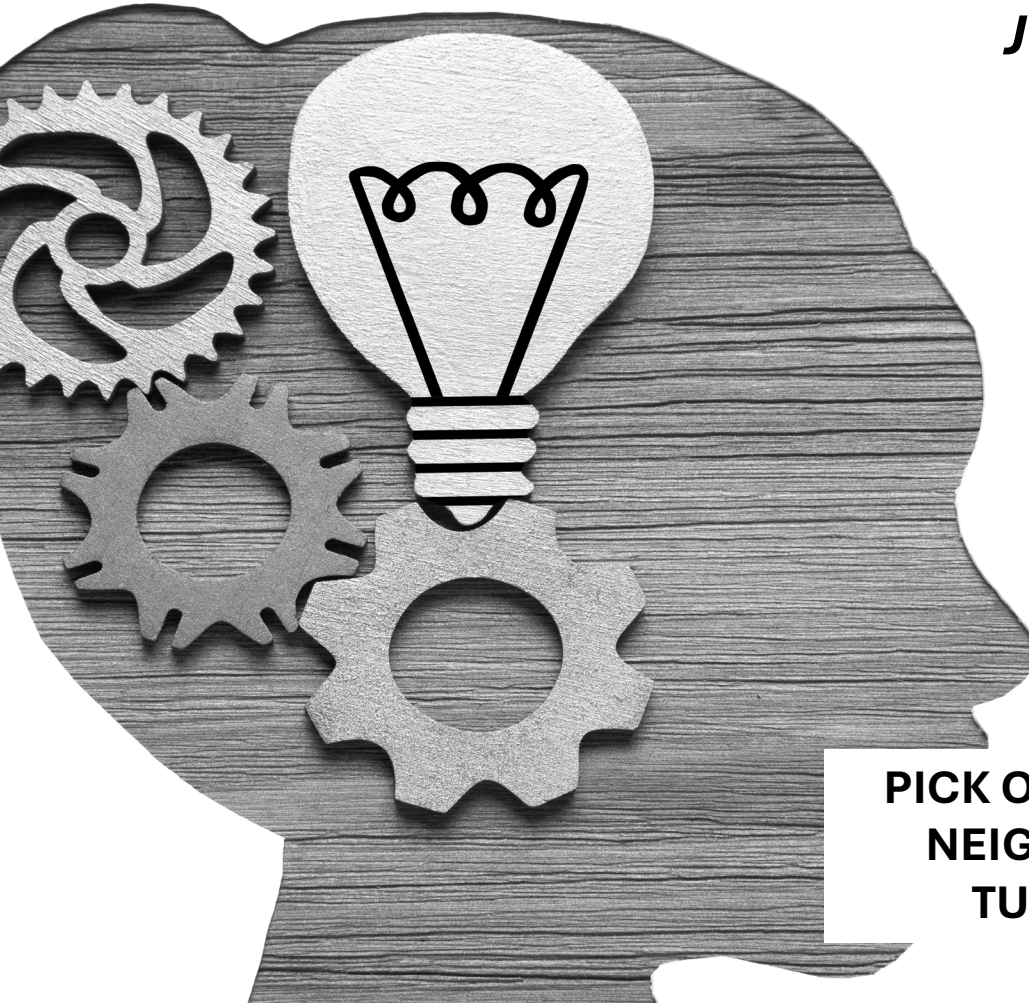
“In the innovative organization, the first and most important job of management is... to convert impractical, half-baked and wild ideas into concrete innovative reality... Top management, in the innovative organization, knows that new ideas are always impractical. It knows that it takes a great many silly ideas to spawn a viable one, and that in the early stages there is no way of telling that silly idea from a stroke of genius. Both look equally impossible or equally brilliant.”

REMEMBER THE WORDS OF WISDOM FROM PETER DRUCKER AS WE NAVIGATE CHANGE

Peter Drucker – Management Guru

Drucker, P. (1973). Management: Tasks, Responsibilities, Practices. Heinemann (p.540)

***2 MINUTES OF RAPID INNOVATION  
MENTORSHIP RE YOUR INNOVATION  
JOURNEY IN AGED CARE!***



**THINK  
+  
PAIR  
+  
SHARE**



**PICK ONE REFLECTION TO SHARE WITH YOUR  
NEIGHBOUR – 60 SECONDS EACH. TAKE  
TURNS. -I WILL YELL: STOP & SWAP!**

**One Trial:** A PEOPLE / PLACE / TECH innovation you actually tested or piloted

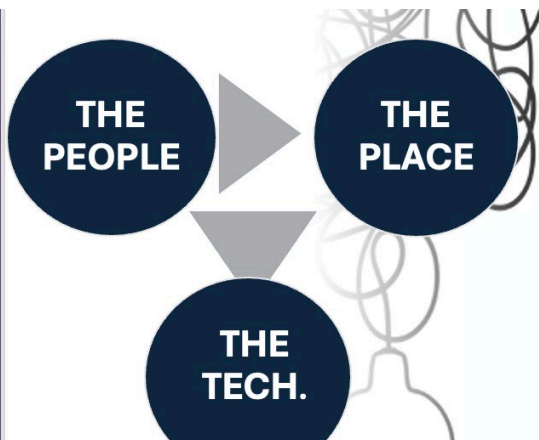
**One Learning:** What did that trial teach you? The good, the bad, or the ugly – **the 'aha!' or 'oh no' moment!**

**One Future Plan:** What is the next innovation / 'Industry 4.0/5.0' step you're excited to take?

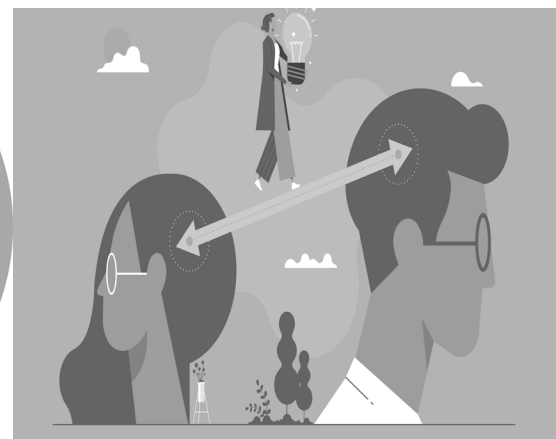


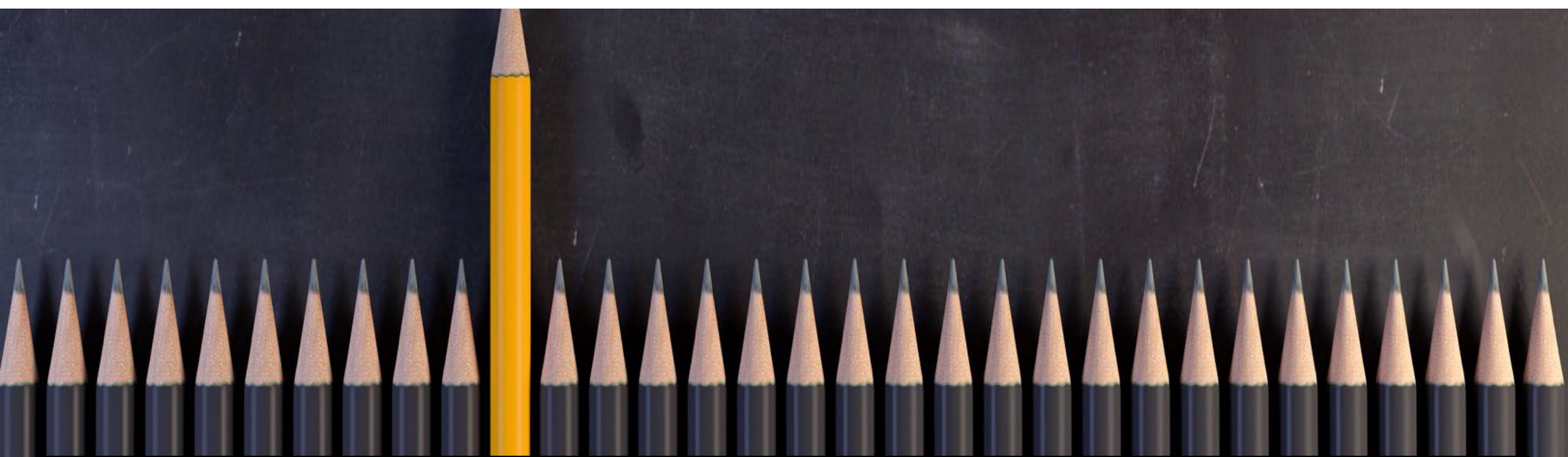
impossible

**“The wisdom is in the system”**



escalating costs  
ageing population  
chronic disease





**From Strategy to Impact:**  
***Turning Bold Ideas into Real-World Innovation in  
Design, the Built Environment, & Robotics***

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