

# Why does Affordance Based Design of built environments improve collaborative innovation and in what way does it accelerate Industry 5.0?

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**Industry 5.0 advocates:**  
a more sustainable, human-centric and resilient industry, prioritising and providing the *"best conditions for innovation to flourish"* (Breque et al., 2021)

## Introduction

Traditional workplace layouts are not conducive to what has become their primary purpose: facilitation of collaborative innovation and cross-functional problem-solving.

Examining the relationship between user characteristics, perceived affordances within the built environment and observed behaviours will inform understanding of why different design choices can impact user to user interaction behaviour, and collaborative innovation.

## The proposed research seeks to enable and measure

- How spatial design and equipment options can encourage or discourage participants' engagement with each other to collaborate and problem-solve in such a way that they are intuitive and user-friendly and without specific skill requirements, as advocated by Industry 5.0.
- How the above can encourage greater multi-disciplinary and cross-functional collaboration within workplace environments.
- How people-centred artificial intelligence can be developed to provide real-time capture and analysis of the spatial, equipment and behavioural factors influencing collaborative innovation to inform better workplace design.

## Proposed Methods

### The research site

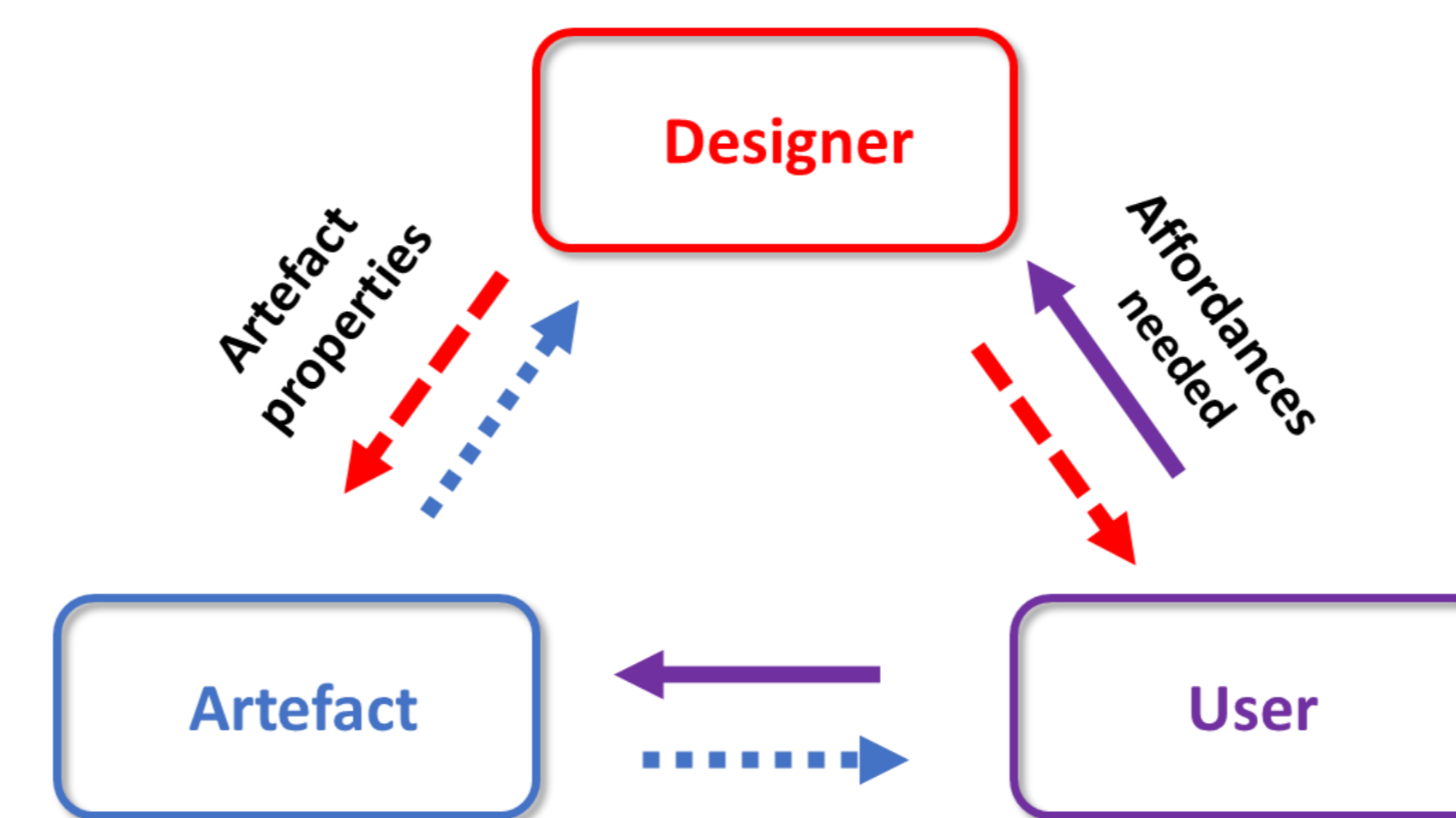
A London Borough Council's 'Future of Work' Pilot and rollout for 4000 staff and their office workplaces and maintenance/repair workshop environments.

A mixed-method study to evaluate how a user-centric ABD framework could benefit the post-COVID-19 public sector workplaces. We will conduct pre-post observations to assess occupancy, levels of interaction, and engagement. The design proposed is a concurrent convergent parallel design structure (CPDS). This approach collects both qualitative and quantitative data at the same time with the data being analysed separately. In addition, a multi-way survey will be conducted pre, during and post-intervention, accessing participants' perceptions of the ABD design implementation.

## ABD Theory Applied to the Human Environment

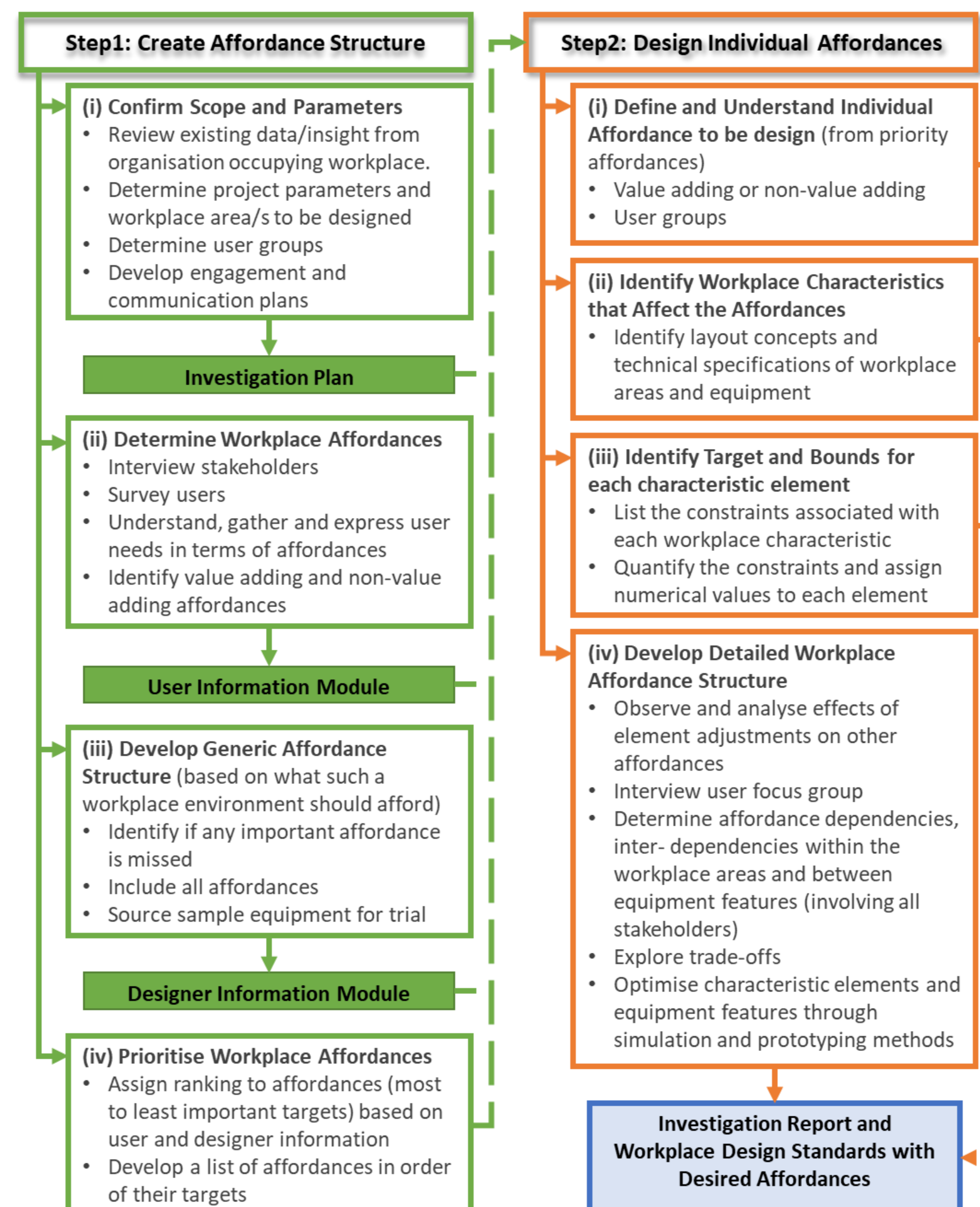
### Designer-Artifact-User (DAU)

(Maier & Fadel, 2001,2003,2006,2009)

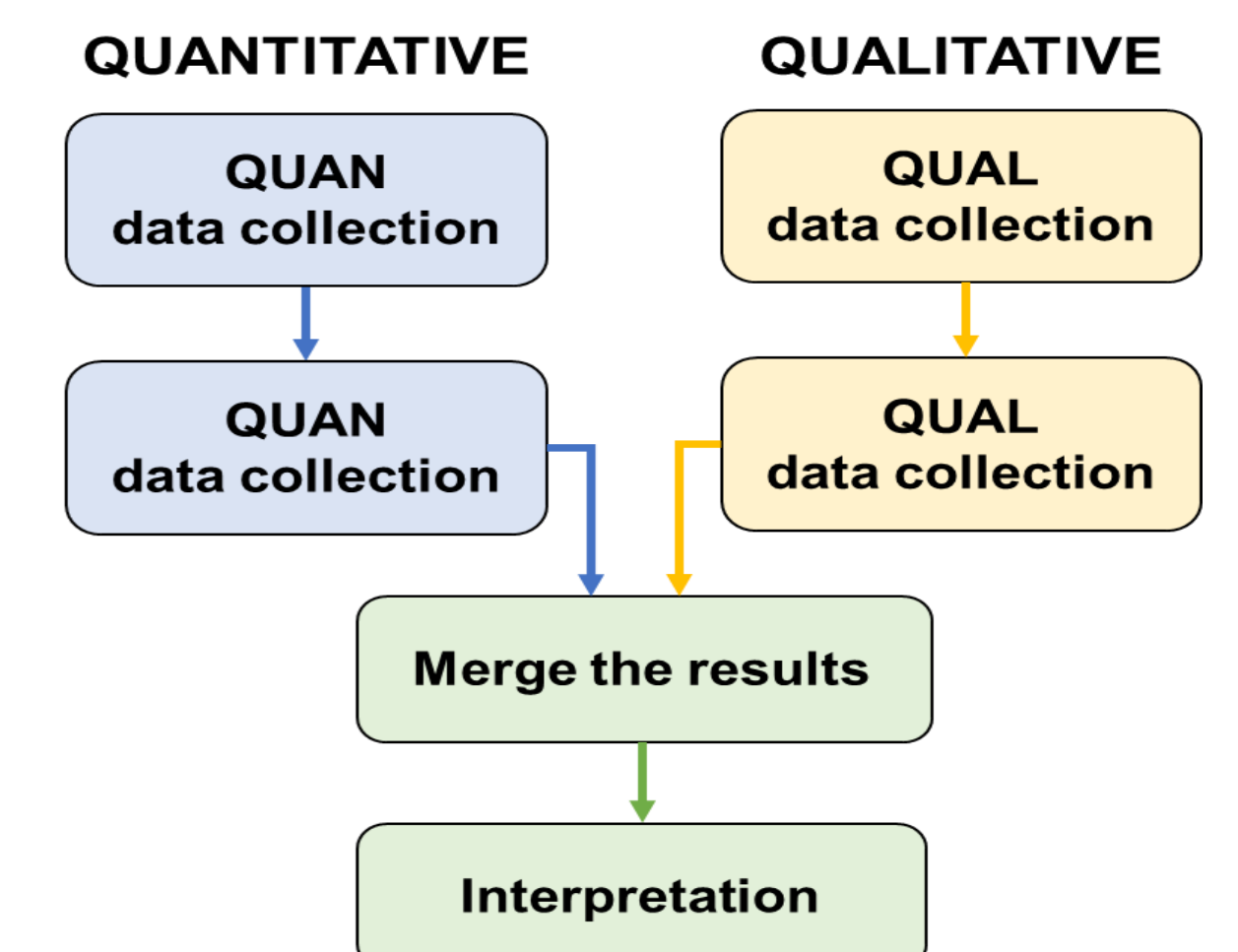


## The two-step process of affordance-based design (ABD) method

adapted from Gupta & Maheswari (2019) process



## Mixed-Method Research: Convergent Parallel Design Structure



		CPDS		ABD Method
		QUAN data collection	QUAL data collection	
PRE ABD	Pre-observation Study (pre-intervention)			
	Staff Survey (pre-intervention)	Staff Survey (pre-intervention)		
DURING ABD INTERVENTION	Staff Survey	Stakeholder Interviews	Staff Survey	Step 1 (i) Determine Workplace Affordances
	Observations	Focus Group		Step 2 (ii) Identify Workplace Characteristics that Affect the Affordances
POST ABD	Post-observations	Staff Survey (post-intervention)	Stakeholder Interviews	(iv) Develop Detailed Workplace Affordance Structure through observation and analyse effects of element adjustments
		Focus Group		
Merge and Analyse the Results				

## Open Research



Open Science Framework Repository – research and data management software

1. Setup project with OSF
2. Data Management Plan
3. GO FAIR - three-point framework
  - a global Internet of FAIR Data and Services where data are Findable, Accessible, Interoperable and Reusable (FAIR) for machines.

## References

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