

# Co-creating Long-term Dementia Care Environments: The Role Of Ai As An Assistive Design Tool

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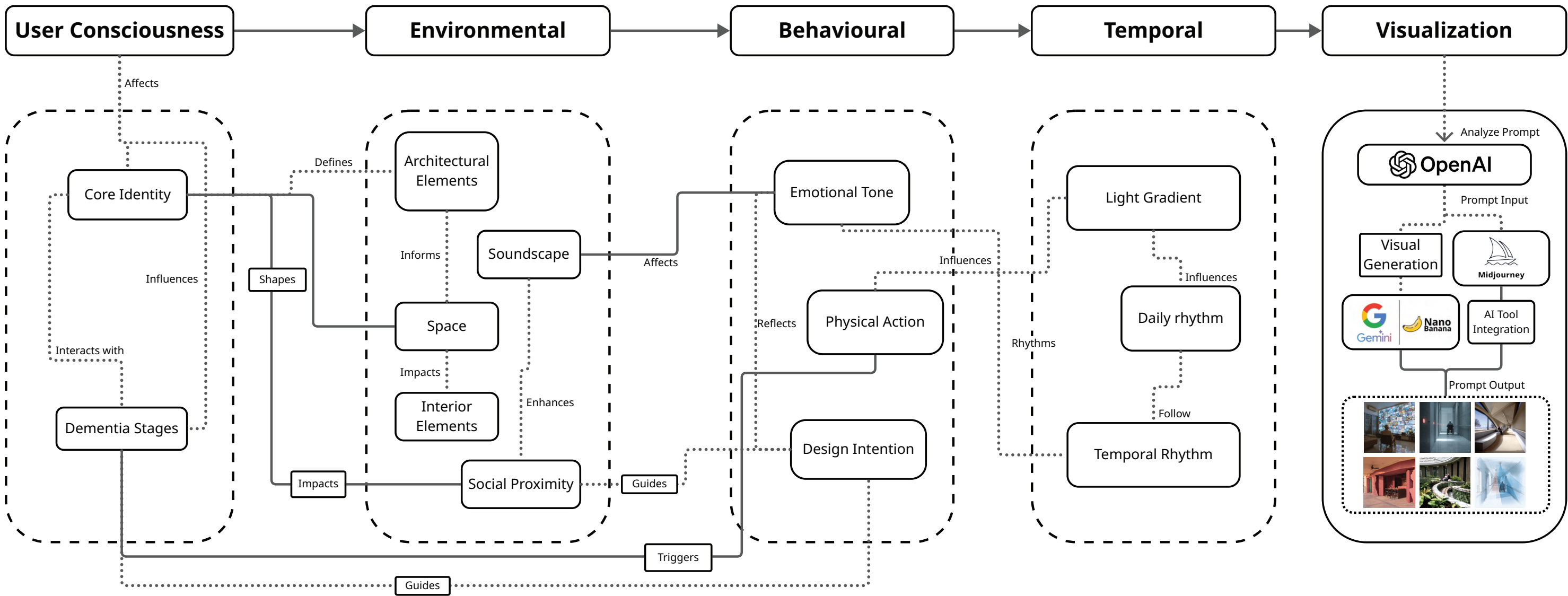
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| Analyze  | how environmental design functions as a form of direct care in long-term dementia support by responding to cognitive, perceptual, and psychosocial needs.  |
| Evaluate | the role and limitations of generative AI as an assistive tool in co-designing dementia care environments with people living with dementia and caregivers. |
| Apply    | a human-centred framework to assess whether AI-supported design proposals align with established principles of dementia care and ethical practice.         |

## INTRODUCTION

Long-term care for People Living with Dementia (PLWD) depends not only on medical intervention but also on environmental design that directly supports cognition, perception, and daily functioning over time. While environmental strategies for dementia care are explored but the role of emerging technologies, particularly generative AI, in supporting long-term care design remains unclear and insufficiently grounded.

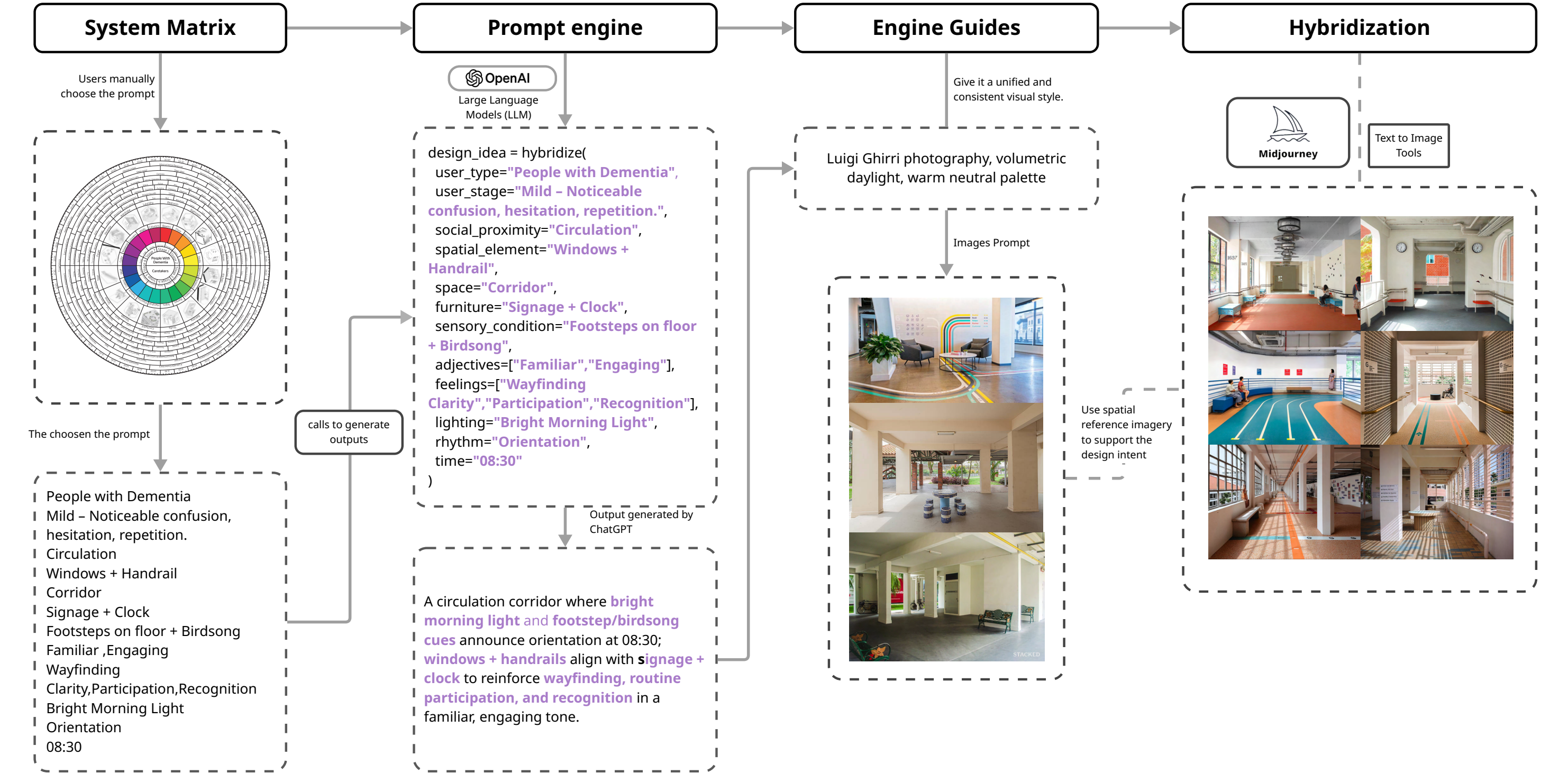
## METHODS

This research employed a qualitative, design-led methodology combining dementia care literature, environmental design principles, and critical analysis of generative AI as a potential assistive tool. The study mapped relationships between different stages in dementia-related conditions, perceptual-cognitive challenges, psychosocial outcomes, and spatial mitigation strategies relevant to long-term and direct care. Based on this mapping, the research identified methodological requirements for responsibly integrating AI into care-focused design exploration, including evaluation criteria and ethical constraints.



## RESULTS

The study found that environmental design plays a direct role in long-term dementia care by mitigating disorientation, stress, and loss of autonomy when aligned with cognitive and sensory needs. However, it did not find sufficient evidence to support the autonomous use of generative AI in producing valid dementia care environments. Instead, the research identified a critical gap: the absence of a validated framework linking dementia care knowledge to AI-generated design outputs and their evaluation.



## CONCLUSIONS

The key finding of this research is that environmental design is a form of direct care within long-term dementia support, while technology should function only as an assistive and critically mediated tool. This is important to the field as it reframes AI not as a replacement for human-centred care expertise, but as a potential aid contingent on rigorous evaluation, ethical oversight, and evidence-based design principles. Future research should focus on narrow, measurable care dimensions such as contrast or wayfinding and develop validated assessment frameworks before applying generative AI to long-term care design contexts.

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