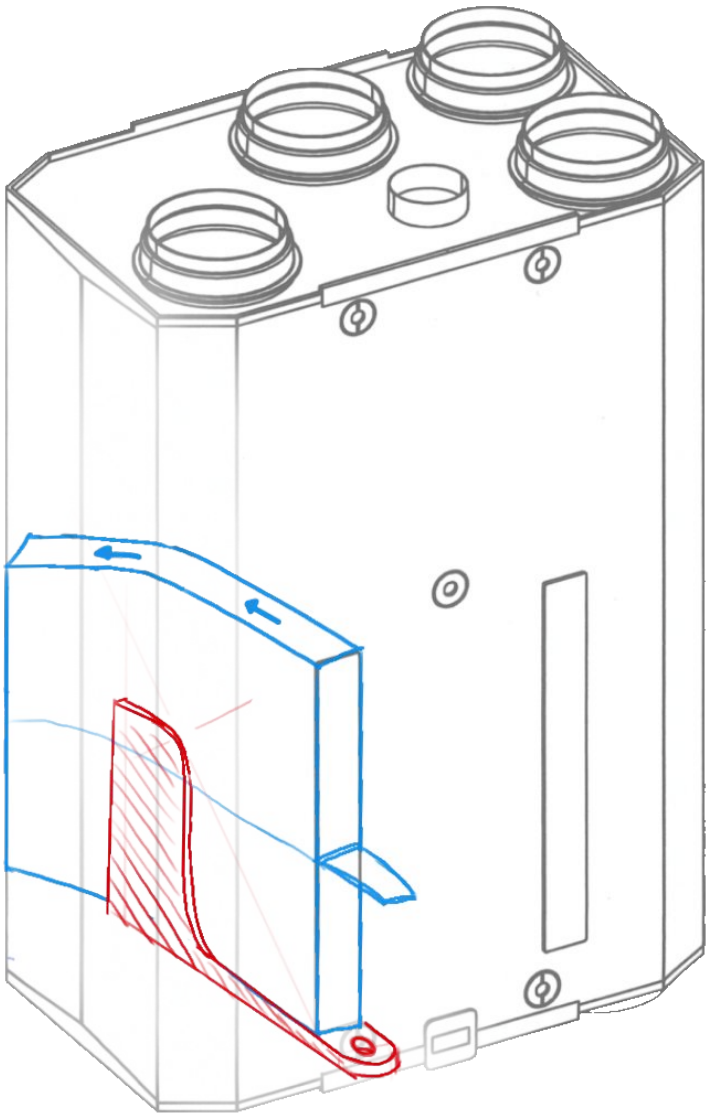
User-Centric Redesign of Ventilation Systems

For skid-based energy efficient building renovations



Introduction

Resident-technology interaction is a critical yet often overlooked factor in the design of energy-efficient homes. Residents frequently do not use Heating, Ventilation, and Air-Conditioning (HVAC) systems as designers intended, leading to a gap between the expected and actual performance of these systems. This disparity presents a significant challenge for energy transition efforts, as the effectiveness of energy-saving technologies heavily depends on proper user engagement and operation.

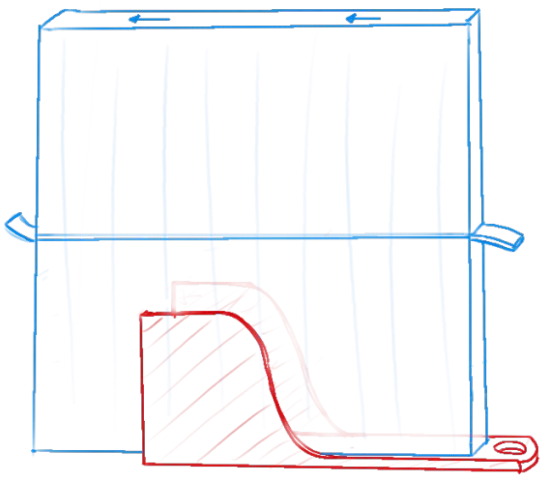
Problem statement

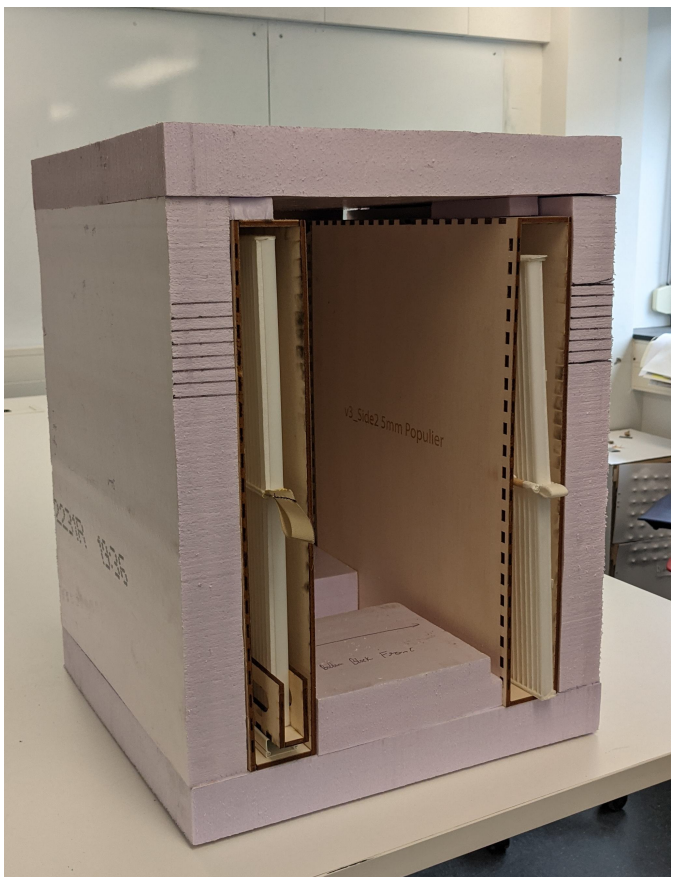
This project aims to enhance the quality of life for residents in energy-efficient housing by redesigning ventilation systems to be more user-friendly. The focus is specifically on skid-based energy-efficient systems within rented social housing apartments, where improved usability can lead to better system performance and overall resident satisfaction.

Final Deliverables

This project investigates the root causes of user discomfort through a comprehensive process involving interviews, observations, research, ideation, and prototyping. The outcome is a set of ten design principles aimed at making ventilation systems more user-friendly, specifically targeting manufacturers. These principles are validated through both user testing and expert reviews, with a strong focus on technical feasibility.

Interactions that cause physical and cognitive strain are tackled through practical engineering design solutions. Proposed principles are feasible and viable, explored through the reference point of retrofitting existing Mechanical Ventilation units for housing complexes.





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