

Accessibility of Public Transport in the Era of Autonomous Vehicles (AVs) - a Case Study with Persons with Physical Disabilities

Master's Thesis of Balasankar Vijayalakshmi

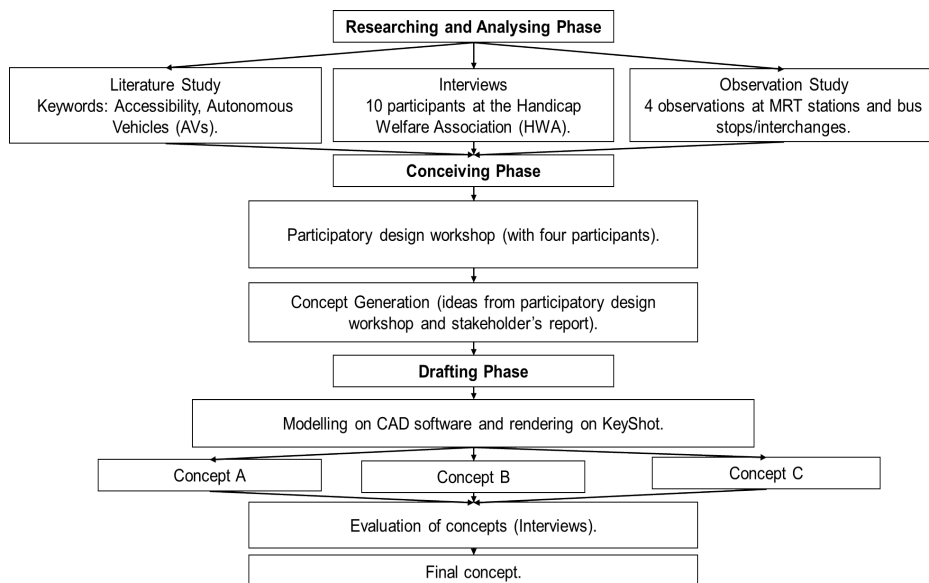
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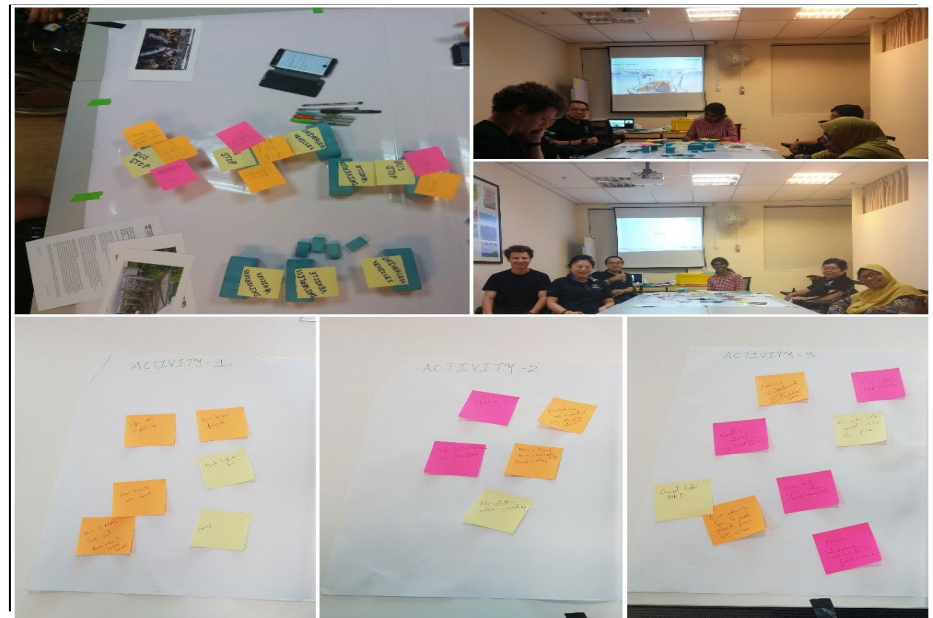
Master Thesis layout according to Heufler's process (Own Source)

The results from the Research and Analysing phase were used to generate scenarios for idea generation in the Conceiving Phase. From the participatory design workshop participants developed several ideas for improving accessibility of Dynamic Autonomous Road Transit (DART). These were related to both vehicle design of DART and the infrastructure associated with DART. Ideas related to modification of infrastructure were only considered because of limited time. Three concepts (Concept A, concept B and concept C) were generated using ideas from the participatory design workshop. Each of these concepts incorporated elements and were modelled on CAD. It was further visualized on KeyShot. Concept A incorporated a modified ramp which helps in level access and a user interface for extending boarding time. Concept B incorporated a modified ramp and a modified shelter. Concept C incorporated a modified ramp, a modified shelter and a user interface for extending boarding time.



Final Concept Rendered Using KeyShot (Own Source)

This master's thesis orients to the Heufler's design process and has four phases. These phases are Researching and Analysing Phase, Conceiving Phase, Drafting Phase and Developing and Optimising Phase. The fourth phase ie Developing and Optimising Phase has not been considered as it involves material study and product development which is beyond the scope of this master's thesis. In the Researching and Analysing phase the issues faced by PWDs in the existing public transport system was studied. For this interviews were conducted in Singapore from 10.10.2018 to 31.12.2018. In the Conceiving phase ideas were developed by conducting a participatory design workshop. The participatory design workshop was conducted with the voluntary welfare organization (VWO), Disabled People's Association (DPA). In the Drafting Phase concepts were generated using CAD software and rendered using KeyShot. The generated concepts were then evaluated through interviews with the VWO, Handicaps Welfare Association (HWA).



Activities in the Participatory Design Workshop (Own Source)

The visualized concepts were used for concept evaluation. A series of semi-structured interviews were conducted with nine participants to know what were the elements that they preferred for a public transport system such as DART. The interviews were audio recorded. The audio recordings were then transcribed. After the interviews, the elements that PWDs (wheelchair users) preferred in each of the concepts were noted. The elements they preferred in each of the concepts were then made into a new concept which was presented as the final concept for improving accessibility for PWDs for DART.