Designing the disassembly and transportability of a mobile bar with a focus on the “Ten Physical Ergonomic Principles” between the user and deconstruction of the bar

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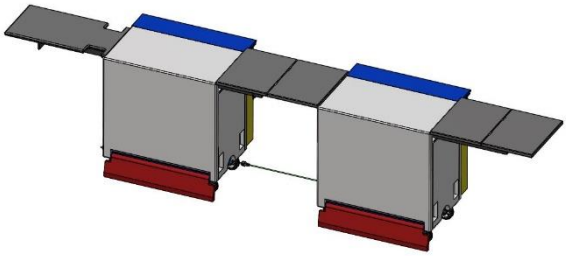
How can a multifunctional bar be made portable and compact so that it is able to be stored and transported throughout and around the Horst building? With the redesigning of the Horst building interior at the University of Twente comes an opportunity to design a mobile bar that can be used for a variety of different purposes, leading to the following thesis statement:

Designing the disassembly and transportability of a mobile bar with a focus on the “Ten Physical Ergonomic Principles” between the user and deconstruction of the bar.

The redesigning of the Horst improves the already limited amount of available space for study places and social corners. However, there is a lack of opportunity for social events that are for more special occasions in contrast to the daily socializing. The goal for this assignment was to design an easy-to-use mobile bar that can be altered to fit the specific needs of the user and event it serves. The bar is made to be used for catered events like barbecues and afternoon drinks but also for non-catered events like committee events, Open Days, and presentations. These occasions vary in both needs and guest amount, meaning the bar must be equipped to serve cold beverages but also provide electricity to power a prototype.

Breaking down of the functionalities was done in a functional analysis flowchart to ensure the expectations of the client are met. These functions and subfunctions were then inserted into a morphological chart to gather the various solution possibilities of each function. The size of the bar is restricted to its surroundings: the entryways and corners of the Horst, so adequate combinations of solutions needed to be found that met these restrictions. Ergonomic dimensions and workspace physical ergonomic principles also restricted the bar to ensure a wide range of users could comfortably transport and operate it. To meet the needs of the various stakeholders, the concept of a modular bar was created.



The breakdown of the five modules, each small enough to fit in the Horst elevator and around corners, is as follows: two identical modules, both with fridge and storage space; one empty module for storing other equipment; and two modules for tapping and serving beer. This project focuses on the creation of the main module with the fridge space, as it is the most valuable to the client. The final design was modeled in SolidWorks in a top-down approach, gradually adapting pieces to fit each other. This resulted in a compact bar with

ergonomic dimensions, containing features that pop-out to increase the usable surface area. The module was designed in such a way that the bar is connectable to other modules, meaning the bar is adaptable to the changing needs and guest amount through the adding or removing of other modules. Testing of the final model was done in virtual reality to visualize the user experience of the bar inside the Horst environment.

The final concept of the bar was designed with the user in mind, it meets the requirements set by the client, and it embodies a compact shape during transport and storage without taking away from the functionalities of a bar.