

G40

Canteen optimization

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1- Environment equipment insertion

Introduction

The tasks performed throughout the day in a school canteen are now very focused on rush hour service, at lunchtime. Of all the tasks the most critical one is the screening of the trays used for processing the respective hygienization. This stage demands several employees to do the separation of waste and components to wash them and put them again into use at the beginning of the chain. The challenge was rethinking the delivery time of the elements, seeking to reduce the tasks performed inside the pantry.

Background

To better understand the problem, we visited various business and school canteens.

During these visits the greatest problems encountered were:

- Bad use of existing equipment (awkward postures);
- Slow process of cleaning the tray elements (five independent tasks).

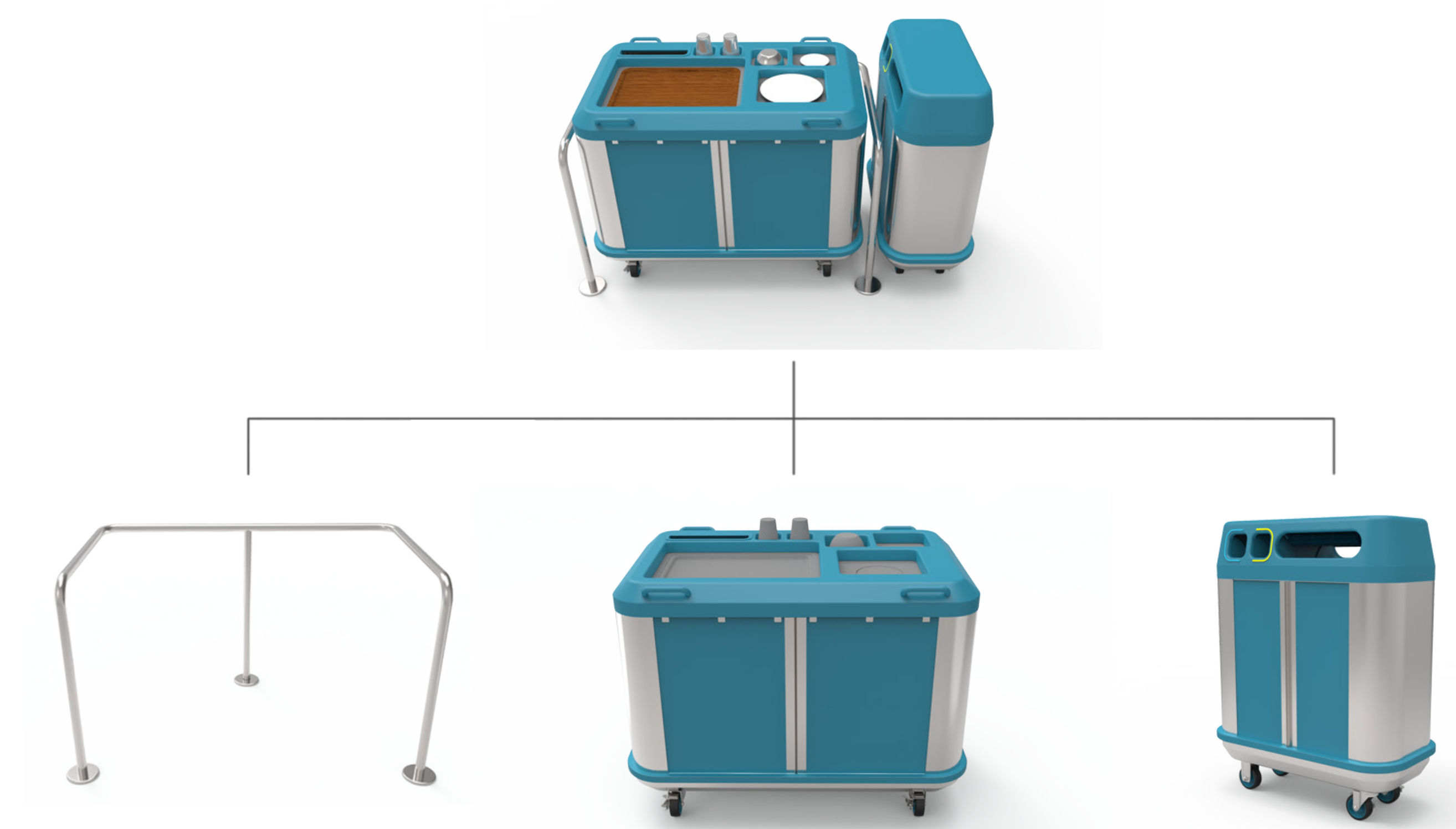
Objectives

- Providing users with a correct posture at the time of delivery of the tray;
- Screening of all residues by the user;
- Separation of all components of the tray by the user;
- Reduce the number of tasks in the pantry, from 5 to 3.

Hypothesis

The proposal sought to bring some of the tasks to the user's responsibility, sorting the objects and the first cleaning of waste. In this sense, we developed a trolley tailored to supply ergonomic conditions for all users, which could allow a correct separation of the elements, but also pack more unities.

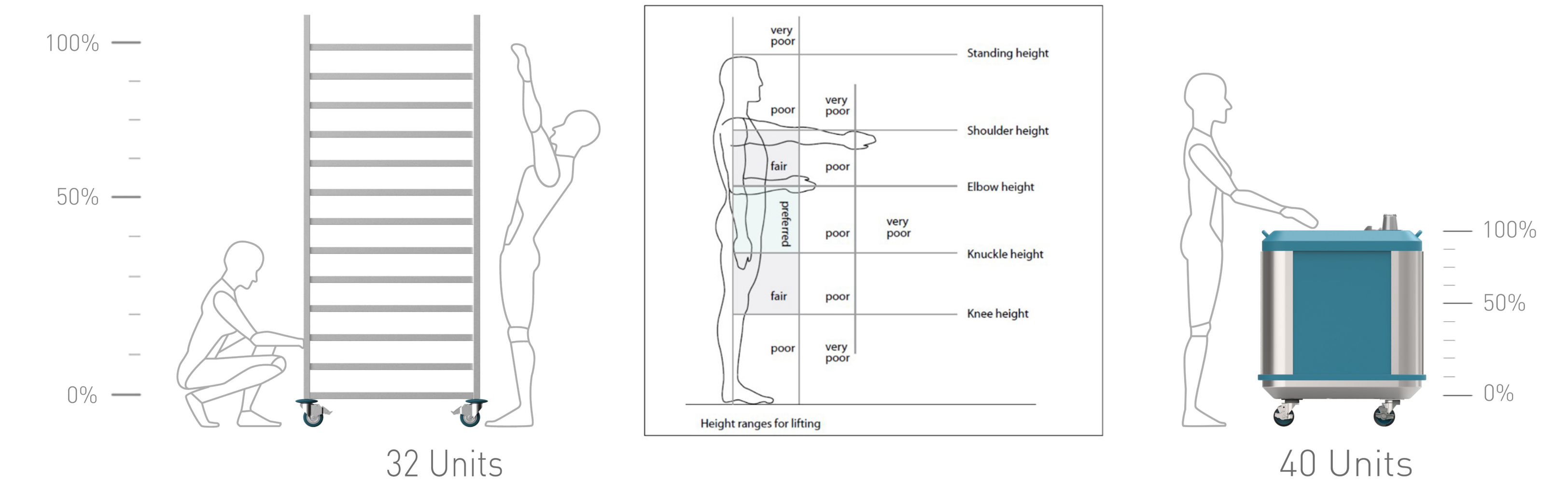
7- Product tree



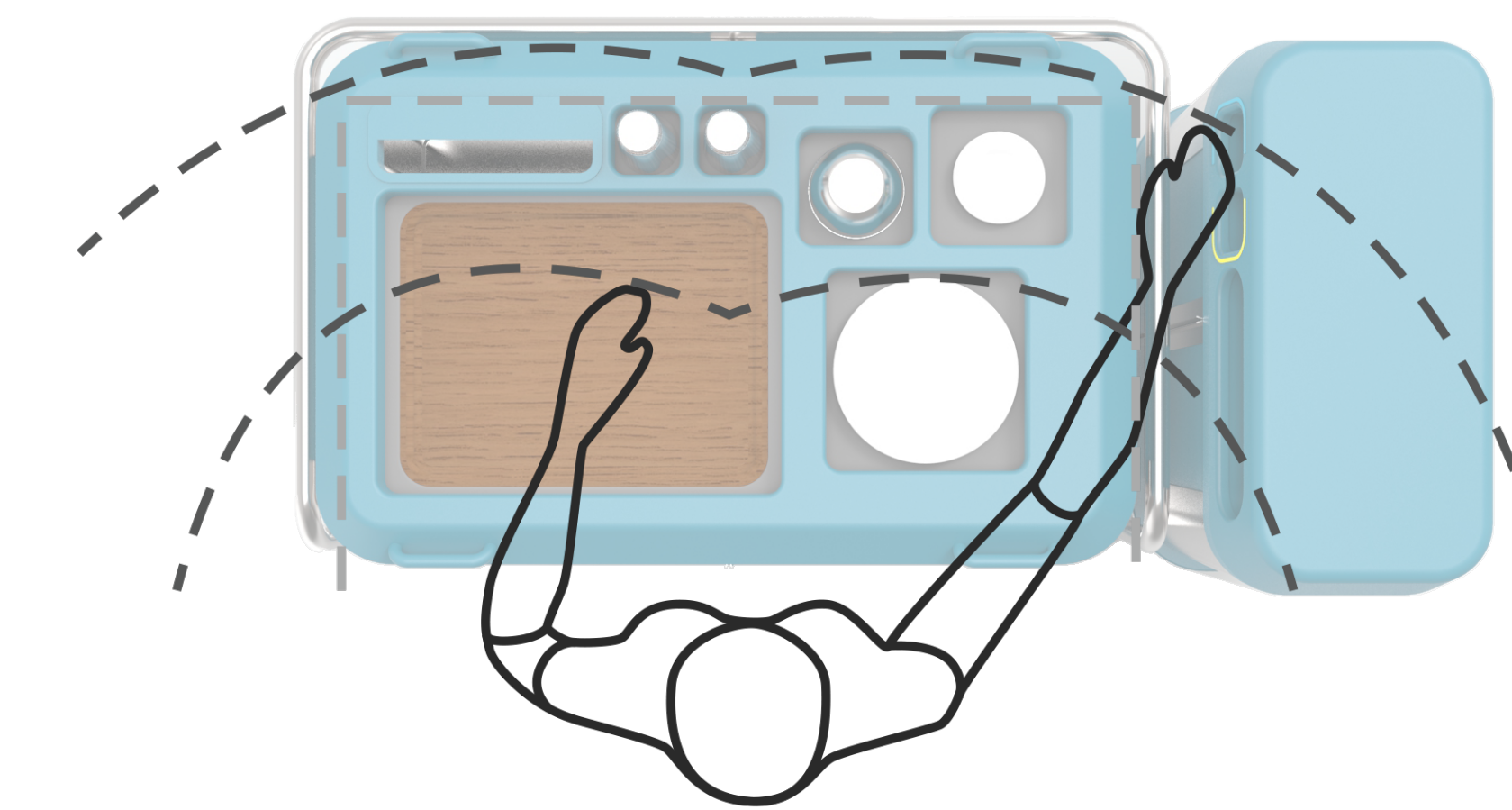
Findings

- Heights of the sets positioning, which have been solved by our product [2].
- The display of the product which complies to the optimization of the application of the force used for the interaction with the set [3].

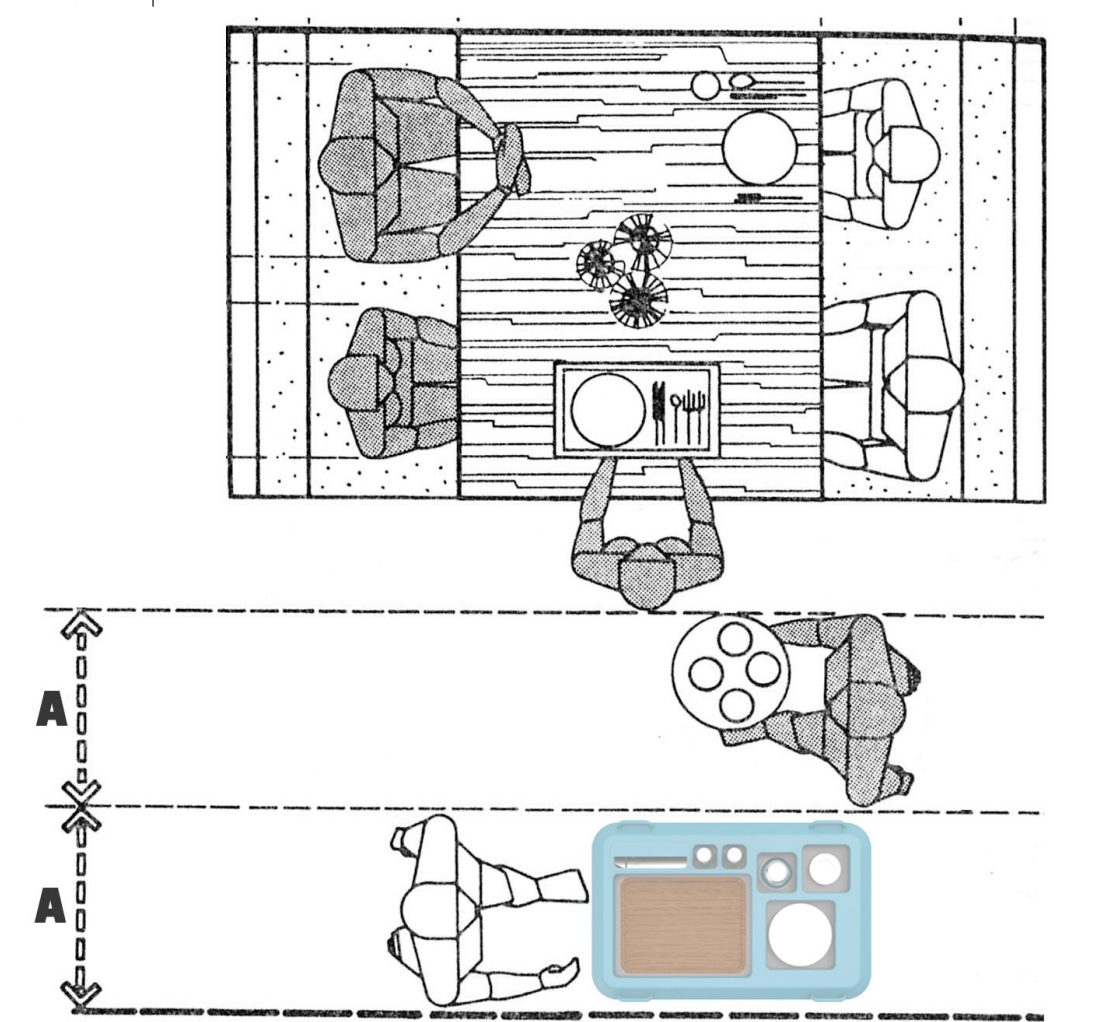
2- Anthropometric and ergonomic relations with the existing solutions



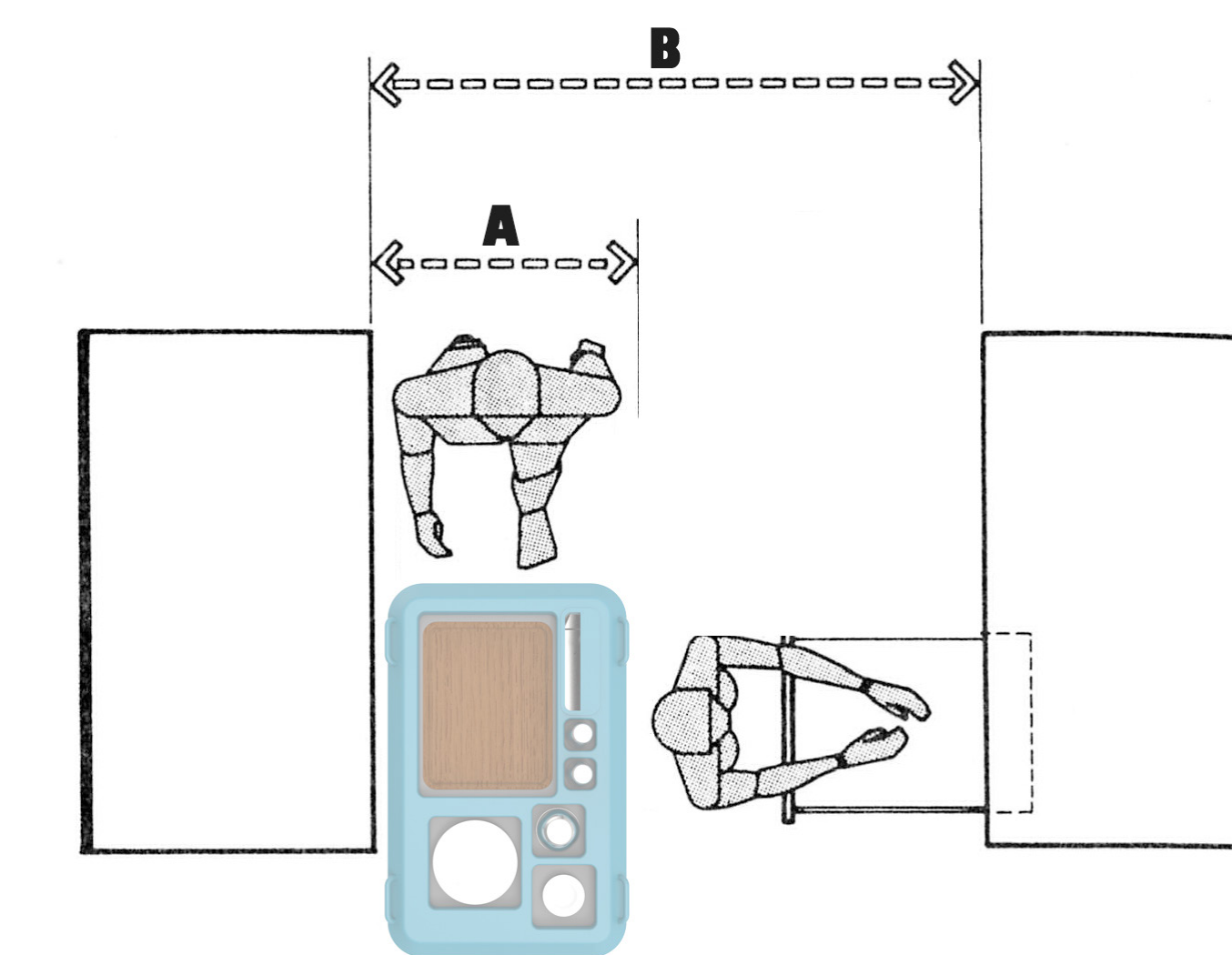
3- User sorting



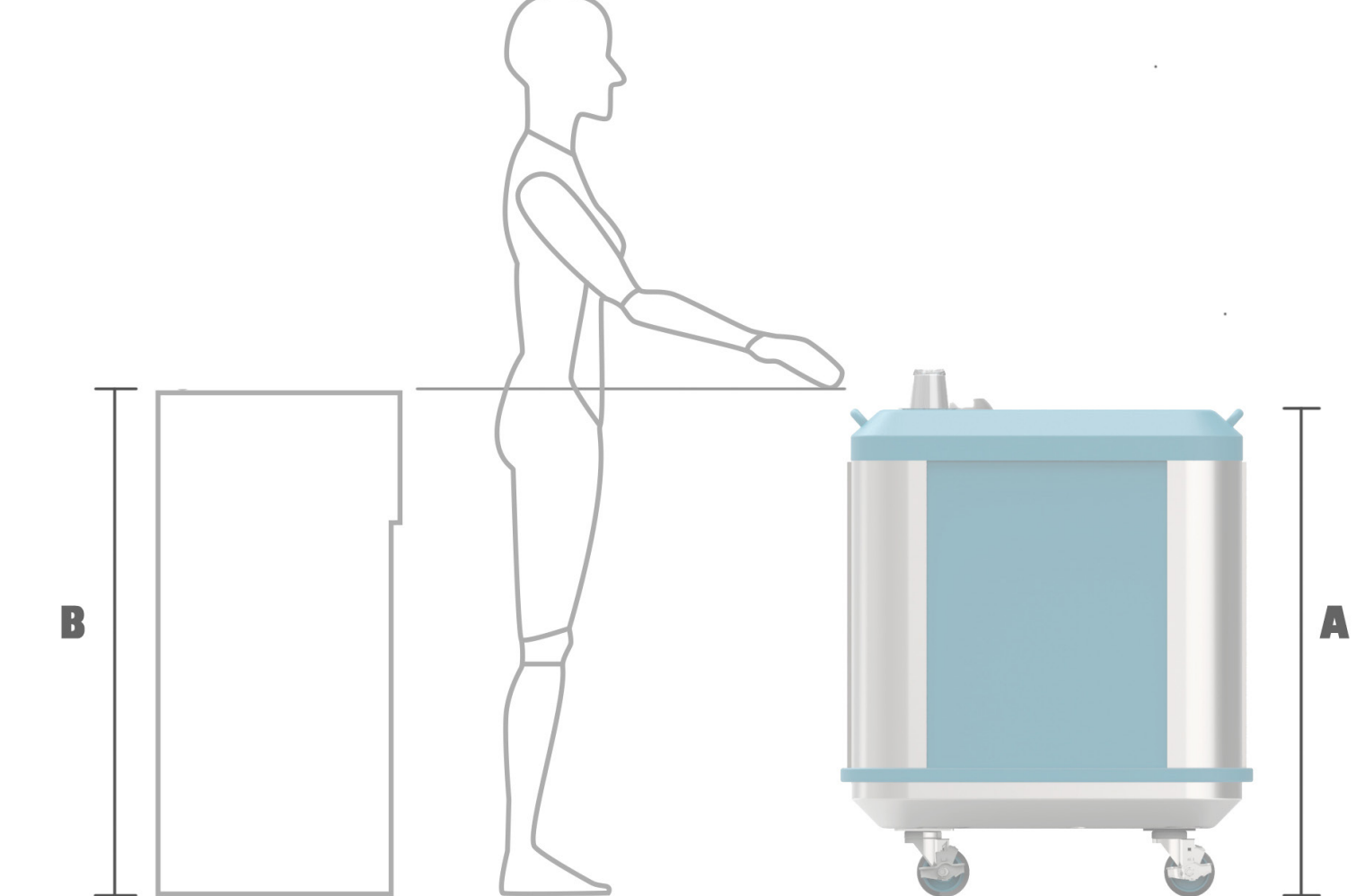
4- Canopy transportation



5- Canopy flows



6- Equipment unloading



Conclusion

This project intended to improve the user experience on school or company canteens, as well as the employee experience by improving flows inherent to this environment. The solution we have reached responds vehemently to all relevant points we wanted to solve and perfectly replaces the existing devices for the same function. In addition to the more orderly distribution of the different elements, their positions are designed from an ergonomic point of view, taking into account the User Experience (UX).

References and Acknowledgments

1. DIN 33411-4: 1987 Human physical strength; maximum static action forces (isodynes).
2. Openshaw, S., Taylor, E. (2006). Ergonomics and Design A Reference Guide, Muscatine, Allsteel.
3. Patkin, M. (2001). A checklist for handle design. Ergonomics Australia [online], 15 (supplement). Consulted on 05/20/2015: <http://ergonomics.uq.edu.au/eaol/handle.pdf>

We would like to thank the company Gertal for the interest and cooperation throughout the project.

Methods

There are two carriages which can be moved through wheels, where:

- The user will separate the various objects found on the board;
- The components collection will be the already properly separated material, to facilitate the transition from cart objects to the canopy;
- There is also the possibility for the frame in any environment and various forms.

6- Prototype



Data Analysis

According to the research done in multiple canteens we have reached some conclusions that make our product quite different from the already existing equipment.

- The existing equipment is only prepared for 32 sets on average (our solution withstands 40).
- On some solutions available today the user spends 21 seconds (on average) sorting the different elements (with our solution this can be done in only 7 seconds).
- The employees usually spend 9 seconds to execute the same task (with our process they would spend only 4 seconds per set [3-6]).