

Challenge name	<i>Safe shopping</i>
Challenge owner	<i>Komen Beheer B.V.</i>
	<input checked="" type="checkbox"/> <i>Company</i> <input type="checkbox"/> <i>Research</i> <input type="checkbox"/> <i>Student team</i>
Brief summary	<p>Covid-19 has changed food shopping: experts believe the coronavirus can survive on surfaces for an extended time, meaning that frequently touched objects such as shopping cart handles, represent a high risk of contamination. With a global food and grocery retail market valued over 10 trillion euro, the interests in developing better solutions to offer a safe shopping experience are high.</p> <p>We present a challenge to develop an automated, affordable, and always-clean shopping cart using latest far-UVC light technologies. The solution should protect the health and safety of workers and customers in the grocery shops.</p>

### About the challenge owner

For the past 20 years, Ties Komen has demonstrated a strong entrepreneurial mindset and has mainly been working in the real estate branch and market. In that role, he also frequently comes in contact with global food and retail companies and franchise owners of shopping centers and supermarkets, where they also discuss the needs of customers within the shops.

One recurring discussion point in these conversations was the hygienic circumstances in shops and the wish of visitors of supermarkets to only touch 'a clean handle' of supermarket carts. This was true especially in 'the peak' of the COVID period, but that desire has continued thereafter.

Through Mark, Ties got in touch with TU/e innovation Space and is looking for collaboration to see if we can develop a solution to this problem.

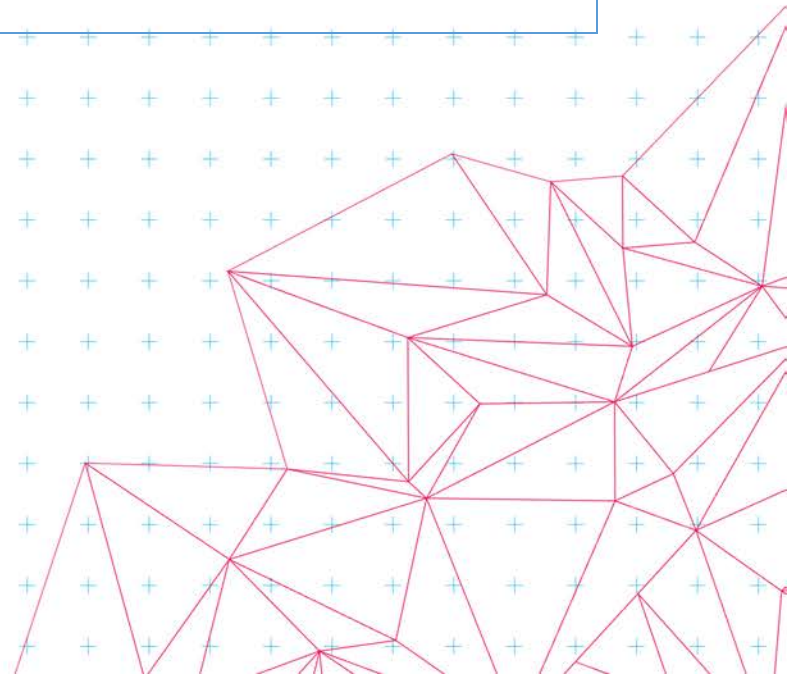
"I would like to actively work with you and want to collaborate to see if we can together realise this idea, and bring it from concept to demo." Entrepreneurship & Marketing group, Building Lighting group and the Future Everyday group.

## Challenge description

The shopping experience has changed. Shopping and doing the groceries is an activity in which almost everyone is engaged, but in these days may require additional measures. We have all had to get accustomed to wearing a mask, manual disinfection of surfaces, social distancing. For sick, elderly and individuals with compromised immune systems, shopping poses even increased risks. Even though the coronavirus in the Netherlands is on its decline, supermarkets in general are thinking of extra steps that can be taken to reduce the impact of future pandemics. Existing COVID-19 strains and new contagious variants remain a risk, but also the perception of shoppers with regards to hygiene and spread of germs in supermarkets has changed. They know now that bacteria and viruses such as the coronavirus can survive on surfaces for an extended time, meaning that frequently touched objects such as shopping cart handles, represent a high risk of contamination.

As a result, shopping centers have developed protection mechanisms to improve the protection of the health and safety of customers, e.g. by requiring individual customers to have a shopping cart to enforce distancing, and they hired additional personnel to manually clean shopping carts with alcohol-based disinfectants. Other solutions involve automated shopping cart-sanitizing systems (e.g. 'cleancarts') but they are expensive and/or require customers or personnel to take additional steps to clean the carts. They are also not always effective in restoring trust with consumers.

We propose a new low-cost and non-invasive method, that can automatically clean shopping cart handles using a small add-on device for shopping carts. The 'add-on' can clean the shopping carts automatically using new far-UVC LED light technology, e.g. by sweeping the handle bar periodically and before a customer picks up an empty cart. The challenge will be to design and build a solution that is proven effective in killing bacteria and viruses, including Covid-19, but it should also be cost-effective, fit different mechanical designs of supermarket carts or be integrated in so-called 'smart shopping carts' that are making its entry in supermarkets.



## Challenge Picture



## Input and involvement of challenge owner

I am able to visit the TU/e on a regular basis to keep track of the developments, to bring in my expertise and to work effectively together as a team, to create a type of win-win collaboration that could lead to a good product, which we can bring to the market. If we can design a good product, we can together turn this into a serious and profitable company (e.g. in 49/51 business partnership).

## Resources

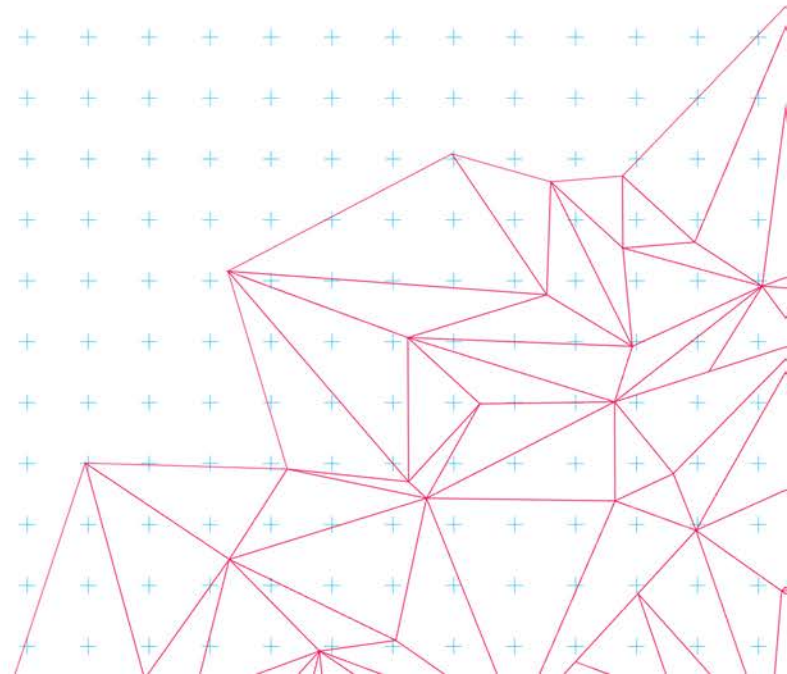
*What resources do you offer to students?*

π Expertise; enthusiasm, social creation of opportunities, entrepreneurship approach, out-of-box thinking, economics and value-creation of innovations with retail branch

□ Materials;

□ Workplace;

π Other: contacts with supermarket (food and groceries) retail branch



## Roles of different disciplines (only for ISBEP)

Please describe possible contributions you expect to see from as many disciplines as you see fit for this project.

Automotive Technology	
Biomedical Engineering	
Architecture, Urbanism and Building Sciences	
Computer Science and Engineering	User Interface development and coding
Data Science	
Electrical Engineering	Design of electronics and intelligent charging system
Industrial Design	
Medical Sciences and Technology	
Psychology and Technology	
Chemical Engineering and Chemistry	
Sustainable Innovation	
Industrial Engineering	How to make the overall solution cost-effective
Applied Physics	
Applied Mathematics	
Mechanical Engineering	Design of sensors, mechanical solution that integrates with existing shopping cart designs

