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2024

A FRIENDLY CROWD LOGISTICS PLATFORM

FINAL REPORT WORKPACKAGE A8 AND B7



MATTHIJS PLATJE MSC.
HANZE UNIVERSITY OF APPLIED SCIENCE

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INTRODUCTION

This report presents the comprehensive findings and advancements made under Workpackage A8 and B7 from January 2020 until January 2024. It details the collaborative efforts and progress in our key area of focus, namely to create more sustainable solutions for delivering packages. The report encapsulates the challenges faced, solutions developed, and milestones achieved during this period. It aims to provide a clear overview of the project's final status, reflecting on both the successes and learning opportunities as we continue to strive towards our overarching objectives.

This document is an updated version of the previous document "Workpackage A8-B7 report jan-jun 2023.pdf". It contains data and findings gathered from researchers and students until the end of January 2024 and closes with recommendations for future investigations and possibilities.



SMILES WORK PACKAGES

The Hanze university of applied science is responsible for the work packages A8 and B7. Below are the (shortened) definitions of A8 and B7 as stated in the original proposal.

A8: A user-centred management system.

In the envisioned future of shared connectivity, employees of logistic companies share network capacity such as trucks and storage. To be able to do that, they need a collective management system that can effectively integrate and convey information to the end user. Our aim is to develop such a system based on the design developed in WP B.7 by integrating legal, spatial, ethical and psychological knowledge. A limited number of promising designs is tested by user panel groups. Based on the outcomes one design is selected to be developed into a working prototype.

B7: A management system for collective sharing

In order to share logistics according to the principles of the physical internet, planners need a system that provides real-time information on key aspects and which is engaging to use. Current management systems, however, usually put the purpose of the system to the centre, not the user. This often leads to wrong usage of systems or a lack of willingness to use them at all. Building on ... the expertise of working with logistics management systems brought in B.1, one could build a user-centred logistics management system that takes into account not only human factors but also optimises user satisfaction and motivation.

Objectives:

- Design a collective sharing management system to facilitate and stimulate sharing in logistics
- Investigate requirements for a motivating and engaging user experience.
- Transform and integrate research output generated by the scientific consortium into functional and user requirements for the system
- Test a prototype

MANAGEMENT SYSTEM FOR SHARING LOGISTICS FACILITIES

Scientific relevance and approach

To address Objective 1, the user context is explored through literature search and by interviewing some of the stakeholders. For Objective 2 and 3, the user- and functional requirements were investigated in co-creation sessions with the user population via observational studies and interviews. Based on these and research output from consortium partners, we realized a fully functioning prototype of the system (A.8). We have tested this prototype in the user population to meet Objective 4.

Design research is aimed at developing and testing generic solutions for practical problems. The envisioned logistics management system essentially is a combination of a management system and a user-centered support system that is designed to accommodate sharing in logistics. The relevance of the system is achieved through studying the needs of users. The rigor of the system is achieved through applying existing knowledge and adding generic knowledge, which is applicable to other user centered support systems.

After the initial research through literature search and interviews with partners, we found:

- Some companies already have systems in place for sharing facilities.
- It would be hard to combine the wide range of products from very different companies in the same shared facilities.
- One interesting problem that hasn't been tackled yet is the 'last-mile delivery' issue. These are the last few kilometers in the logistics chain, which cause most of the problems (in terms of costs, environmental impact, time).
- There are interesting opportunities to involve civilians to help out with deliveries.
- Some parties, like the municipality, would like to see less traffic inside cities.

CROWD LOGISTICS

The idea of a Crowd Logistics Platform seemed to fit these findings quite well.

Crowd Logistics is defined as the outsourcing of logistics services to a mass of actors. It basically comes down to the idea of using anybody to deliver goods to anybody. There is a parallel to, for example, Uber for deliveries: with Uber anybody with a car can function as a taxi. In crowd logistics: anybody who can carry something, can deliver something.

This might be a solution for the last-mile delivery issues because many people already travel within the city; if they all would carry some goods, there would be less delivery vehicles necessary. Such a platform would ideally benefit the whole community. Another term for Crowd Logistics is Crowdshipping and Wikipedia give the following definition: "Crowdshipping is an example of people using social networking to behave collaboratively and share services and assets for the greater good of the community, as well as for their own personal benefit".

The first prototype was heavily inspired by Uber where users could track a package, calculate delivery costs, do payments and many other features that could be useful for a system where everybody can deliver for everybody. However, it became quickly clear that such a system has many complexities on several levels. Not only became it technically very complicated to implement all these components but also many questions arose about privacy and security. Would people trust just anybody with their, potentially, expensive package? Would they want to share their address with anybody?

Just as with systems like Uber, in order to fully trust the system, you want to be sure who is delivering goods, which might require a copy of a passport. But when the platform needs to store such sensitive data, it needs to be highly secured. What would happen if a package gets lost? Who would be responsible? Also the amount of data that needs to be supplied when making an account on such a platform might be a huge step for most people. And when you request for a delivery, a lot of data needs to be entered before such a delivery can take place, which also might hold people back from actually using such a system.

CROWD LOGISTICS

These difficulties also became obvious from further research into companies and start-ups who have tried to setup such a platform. Worldwide there have been several attempts to build and deploy such a concept successfully, but nearly all have failed.

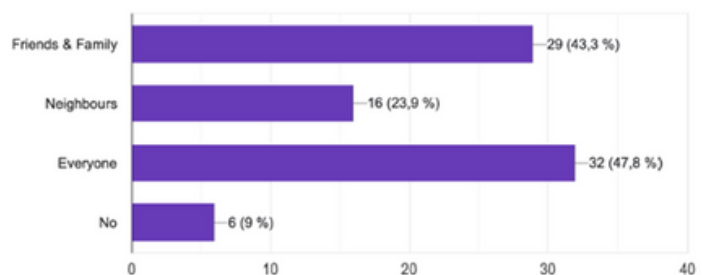
Several reasons can be given in retrospect. Companies and start-ups did not develop a good business case, the system was overly complicated (due to liability, payments, privacy, security, need for partners and other reasons), people were willing to deliver for financial gain but caused more d-tours which are causing less sustainability, it is more expensive due to extra delivery costs and costs for maintaining the platform, it requires a large group of users and good route optimization is difficult.

However, there are people are willing to deliver for people they know and they are willing to do this for free. We know that Many people regularly move from one location to another and have storage capacity when travelling and when they trust each other, they can exchange details about locations and payments between themselves.

Of course it is always a question if enough people would be interested to participate in such a concept. Results gathered by students have shown promising results. One group conducted a research using a digital questionnaire on tablets and asked people to fill in this questionnaire on market day in Groningen (n=67). The students presented a bike-based crowd logistic concept (city).

Some highlights of the outcome:

Would you consider delivering such packages?
67 Antworten



RESEARCH AND REQUIREMENTS

- 54 participants were under 25 years
- Only 6 would not consider delivering
- A small detour seems to be acceptable
- Most would deliver for free or a very low compensation
- Shoe-box size is acceptable by most
- Paying extra for sustainable delivery.

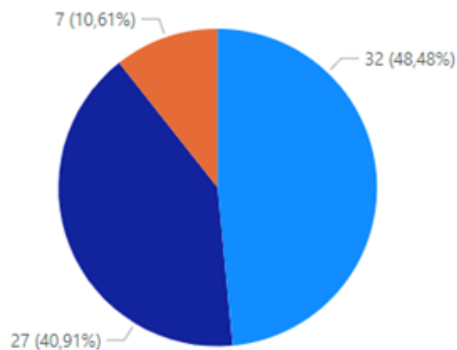
Based on findings and with the experiences of previous prototypes, a Crowd Logistics platform should be free to use both for the platform and for the deliveries. It should be for people who know and trust each other. Very simple to use with minimal information needed, no payments via the platform itself and it should focus on people that travel regularly.

Another group of students went to another, similar, platform and invited people from there to answer some of the student's questions. These students mostly asked open questions and all the questions were in Dutch. Some interesting positive findings are in general that:

- People find this idea a convenient way to be in contact with people they know.
- People like the idea that only a limited number of people (namely, the people in their Versoek contact list) will see their requests.
- People have a very positive attitude towards helping people in their close community.

Would you do these deliveries for free?

● No, but for "Coffee Money" ● Yes ● No, but for half of minimum wage (5-6,-)



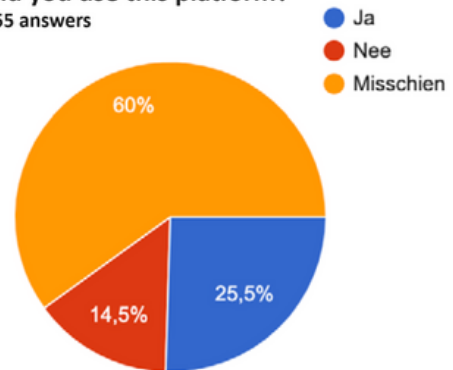
RESEARCH AND REQUIREMENTS

On the right are the results shown for the question who would use this platform.

- 26 percent of these people would definitely use the Versoek platform
- 60% have answered that they might use the platform
- Only 14.5% would not use the platform.

Would you use this platform?

55 answers



Below is a graph that shows the numbers and categories of people with whom they would share their requests with or of whom they would like to see the requests (the graph is in Dutch).

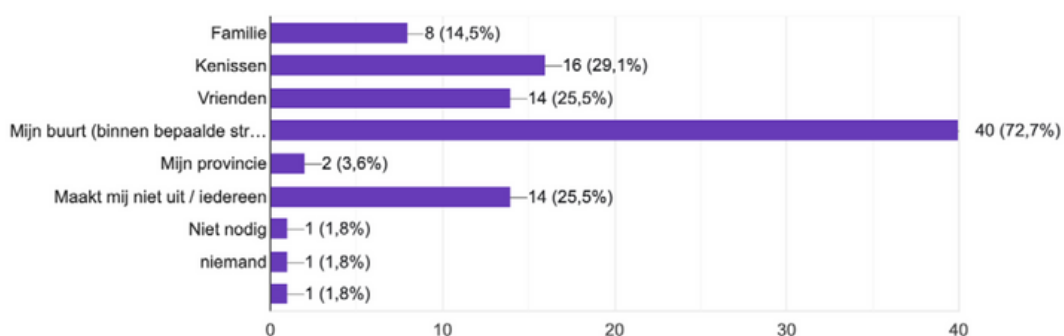
Interestingly, a large majority would like to share and/or see requests from others in their neighborhood. Only a small number of people would not like to share their requests.

Some negative findings, or reasons why people would not use the platform:

- Questions about the trustworthiness of the platform.
- People already use other platforms
- The platform might get filled with useless or unwanted requests
- It could take long before a request is accepted, especially when the number of people on the platform is very low.

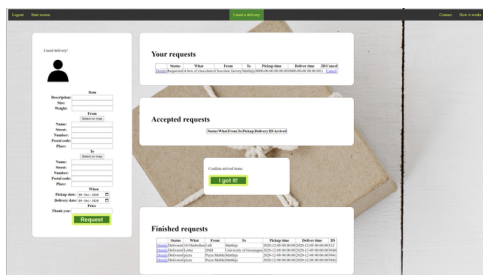
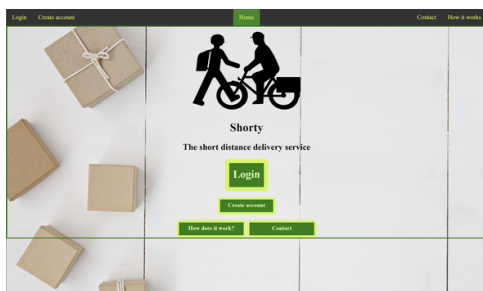
Van wie zou jij deze Versoeken willen zien/ met wie zou jij jouw Versoeken willen delen? Meerdere antwoorden mogelijk.

55 antwoorden



CONCEPTS AND FINAL PROTOTYPE

A few concepts were created prior to building a fully functional prototype. The first concept was heavily inspired by Uber, where deliveries could be tracked via GPS, payments could be made via the platform and people could give reviews to others. Below is a screenshot of the first concept.



The visualization of this first concept made it easy to show ideas to others and it quickly became apparent that the amount of information that is needed from users and the complexity to handle all this data was not desirable. This became especially obvious after making a mock up for a mobile version.



The above images show how much information might have been necessary for requesting a delivery of a package.

The second concept was a more creative and unique approach of building the website. It used interesting graphics and menu system and needed far less information.



This concept was indeed perceived as unique with its 3D background and semi-transparent menu but quickly became too complex to build, the visualizations did not really add anything useful to the concept and used a lot of processing power.

CONCEPTS AND FINAL PROTOTYPE

After collecting feedback from both concepts, it was clear that the platform for crowd logistics would greatly benefit from simplicity, both on usability as well as technicality.

A new idea was formed in which users hardly needed to give any information and, partially because of this, would be very simple to use. For this idea, a concept was first created using Figma, a no-code prototyping tool. Below is a schematic of the screens that would be necessary for a minimum viable solution.

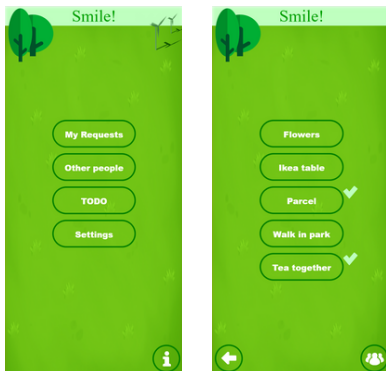
This version was well received by our test groups. The app was easy to navigate, people could find their way around for either creating new delivery requests or for accepting deliveries. The overall idea of this concept was obvious and we decided to create a working prototype based on this idea.

(The idea behind this prototype is further explained below, in the section about the final prototype)



CONCEPTS AND FINAL PROTOTYPE

The green screens below show this working prototype. We decided to develop this version of the prototype with web-based technology to be more flexible on which platform it could run. However, this version has never been tested because a group of fourth year design students came up with a much more interesting and professional design.



The design of these students has been used as a guideline for developing the final prototype (see below).

The final version is meant for people who are willing to do something for people they already know and trust. This could be neighbors, family members, colleagues, friend or sports club members.

Users of the platform create a contact list of people that they are willing to do something for and they will only see their requests in a list of requests. Since they most likely already know their contact details, this information is not necessary to be known by the platform. If any cost is involved, for example, when somebody forgot to buy a bottle of milk, they can arrange this easily between each other and therefore, no complicated or costly system is necessary for payments on the platform itself.

The final prototype is now online and running at www.versoek.nl. The next page shows a screenshot of the landing page of the website.



Versoek

Het vriendelijke bezorg platform

Voor jou!

Door jou!

Het platform is in volle ontwikkeling

Ben jij benieuwd wat het inhoud en wil jij op de hoogte gehouden worden van de ontwikkelingen? Lees meer en meld je aan voor de nieuwsbrief!

Lees meer over SMILES!

Meld je aan!

Tijd tot launch

42 20:36:28



Bezorger

Wil jij pakketjes gaan ophalen en bezorgen op jouw route? Lees dan meer over de voordelen hiervan

Klik hier



Consument

Wil jij pakketjes bestellen op een verantwoorde wijze? Lees dan meer over de positieve gevolgen hiervan

Klik hier

Join the community!

VERSOEK.NL

Versoek.nl consists of two parts, the information pages and the actual crowd logistics platform.

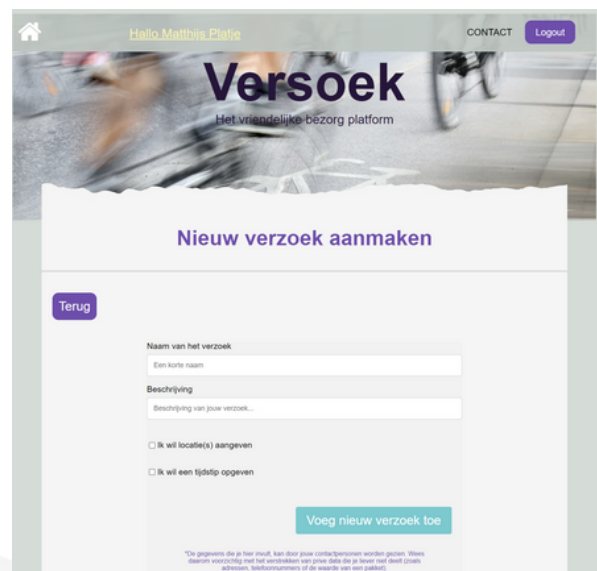
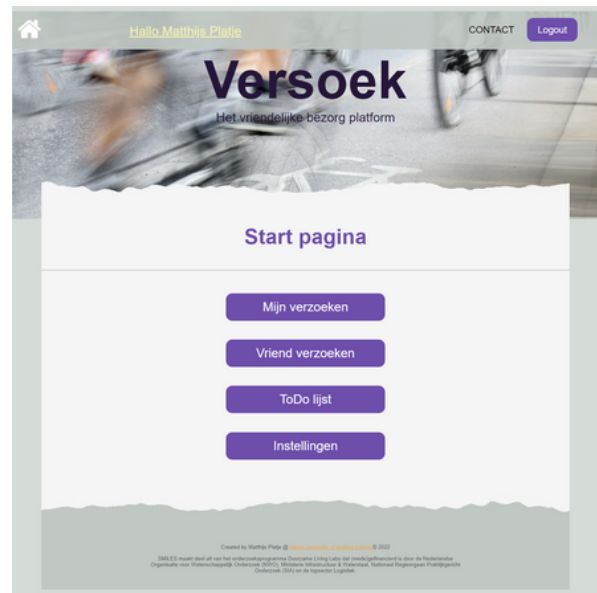
When a visitor comes to versoek.nl, the general information page is shown. This part of the platform shows:

- General information about Versoek, what is it, what we want to achieve.
- News items, updates
- Apply to the newsletter, contact us
- The parties that made this possible, SMiLES, NWO, Hanzehogeschool and other partners

The website should help to convince people that this is a great idea. It invites them to subscribe to the newsletter and that they might want to create an account and start using the platform

The second part consists of the actual platform where people can make and/or accept delivery requests. Here people can:

- Create an account
- Add requests for deliveries
- Create contact list
- See requests from contacts
- Accept requests
- Todo list of deliveries for contacts



VERSOEK.NL

Versoek means request in African language. It was built with all the mentioned requirements in mind. The platform was built using html, css, JavaScript and PHP. It uses a MSSQL database and is practically not depending on third party libraries or software (except for hosting) and is fully under our own control. This makes it very easy to make quick changes and try different layouts, colors and graphics to see what is the best way to interest people and to keep people on the platform. It also enables us to change functionality based on user feedback or other new ideas.

During the development, the Pre-DPIA was approved for this project. Since the platform only requests a minimal amount of user information and only collect a small number of data points, a full DPIA was not necessary and the Pre-DPIA was quite easily passed.

During this time, hosting was arranged via the Hanze ICT service and was initially done by Vevida. However, this provider was taken over by Yourhosting just a few weeks later. This didn't really cause any issues except for their (indirect) availability to answer to requests.

This problem became evident when we run into a problem. ICT support had requested a list of specification which were required to run the platform and although these were quite minimal, the requested specifications for the server was not met.

In detail: instead of a MySQL server, for which all of the code was made, the provider had set up a MS SQL server. Although this might seem like a very small difference, this meant that none of the database code was working and, since the platform is heavily relying on a database, a lot of code needed to be changed and re-tested. This caused a few months delay but currently works fine with the MS SQL server.

VERSOEK.NL STATISTICS

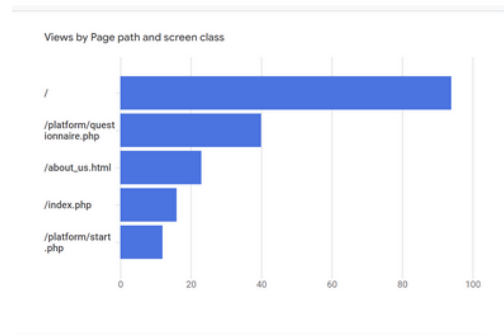
The last method of collecting data which is built into the website, is the ability to show questionnaires which people can fill in at any time.

When users login, they see at the top of their page a link called "Questionnaire (X)", where X is the version number of the questionnaire. When they click on the link, they will navigate to the page that contains the questionnaire.

The questionnaire may contain open questions, multiple choice or pre-defined answers. At the bottom of the questionnaire, there is a submit button which will send all the answers to a database. The questions and answers are stored for each user in a separate questionnaire database and information can be retrieved by the researcher.

On the right is a screenshot of the first questionnaire. Unfortunately, until the date of this report, nobody has filled in the questionnaire and therefore there are no results from this built-in questionnaire.

The website had over 250 page views until this date. On the previous page and below are screenshots of some of the Google analytics data.



Halo **Matthys Plate** VRAAGENLIJST 1 CONTACT Logout

Versoek

Het vriendelijke bezorg platform

Vragenlijst 1

[Terug](#)

*De gegevens die je hieronder invult, worden alleen verzameld voor wetenschappelijke doeleinden en zijn persoonsgegevens. Wees zeker altijd voorzichtig met het verspreiden van prive data die je beter niet deelt (zoals adressen, telefoonnummers, etc).

Vraag 1a - Het concept van Versoek is duidelijk (1 - Ja, 5 - nee)

1 - Ja
 2 - Redelijk
 3 - Matig
 4 - Nauwelijks
 5 - Nee

Vraag 1b - Beschrijf het concept van het Versoek platform in uw eigen woorden

Uw antwoord...

Vraag 2a - Ik ga dit platform gebruiken! (1 - Ja, 5 - nee)

1 - Ja
 2 - Ik denk het wel
 3 - Misschien
 4 - Ik denk het niet
 5 - Nee

Vraag 2b - Waarom zou u dit platform wel of niet gebruiken?

Uw antwoord...

Vraag 3a - Hoe vaak reist u gemiddeld per week? bijvoorbeeld naar werk of school?

CARPOOLING

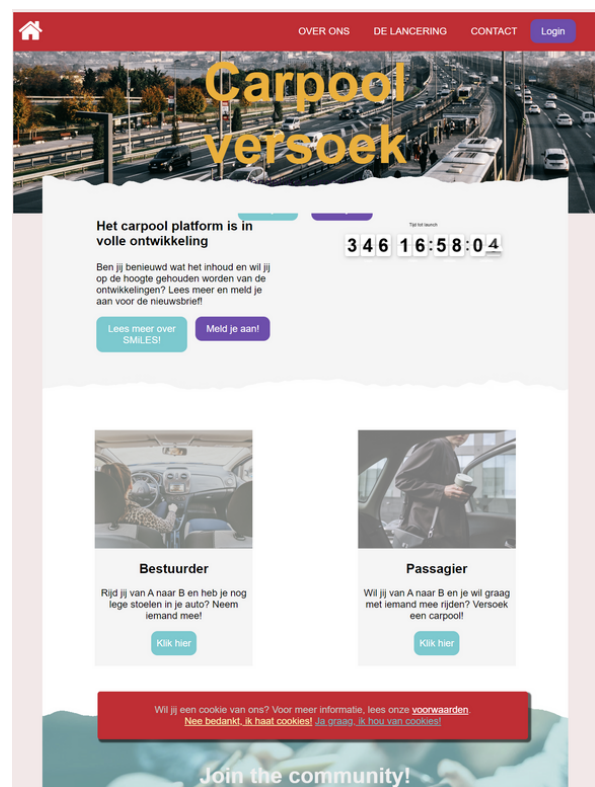
One request to use the platform in a different way came from the Hanze facility management. The main campus of Groningen, known as Zernike, houses many faculties of the University of Groningen (RuG), most of the Hanze university of applied science as well as several companies. The campus is the workplace of many thousands of people and many of those come by car.

Other parties have also shown some interest in the carpool version. Some meetings have taken place but organizations are reluctant to start a large scale pilot test based on the current version.

The amount of cars take up a lot of parking space, cause a lot of traffic movements and is of concern for the safety of many cyclists and pedestrians. In order to decrease the number of cars, facility management would like to run a carpooling pilot. Because the platform has been setup very versatile, it can easily be changed to accommodate a different domain. The focus of the platform was for people to request the delivery of goods but other requests can easily be made as well.

For carpooling, people can put a request that they want to travel from A to B. If another person has you in your contact list, the request will show up in their list and they can accept to bring you along their travel. Some minor changes have been made in order to accommodate for this, for example, by filling in the start and destination locations.

Below is a screenshot of the current version for carpooling. This version has been running for a few months at carpool.versoeek.nl.



PREVIOUS ACTIONS AND RESULTS

Previous actions

Below are the actions that were taken as they were promised in the previous report.

About half a year ago, a newsletter has been sent to the members of the consortium to take a look at the new platform and a request has been made for testing and feedback.

Partners have been asked to help out in advertising the platform. Especially Wagenborg, a partner in our work package, have offered their help on multiple occasions. A few meetings have taken place after the summer and JanDouwe Douwstra from Wagenborg has supplied numerous contact details from a wide range of people and organisations on Ameland to see who could help us to start a more extensive and real test for the crowd logistics platform. Ameland seemed like the perfect area to test our platform since people on the island already share and do a lot for each other. They could provide valuable information on whether a platform dedicated for delivering packages to friends, neighbours and friends would be a great addition to what they currently use and if its functionality is complete.

The faculty of psychology at the university of Groningen has been a great conversational partner and wanted to stay involved in setting up experiments with the platform.

Bachelor students from the Hanze university of applied science as well as the university of Groningen were again invited, as we do each year, to help out with some of the research aspects or find different relevant approaches for both the crowd logistics platform as well as the carpool version.

Both the website and platform for both the crowd logistics as well as the carpool version are online, and were thoroughly tested and only some minor changes were made based on testing and feedback.

Results

Unfortunately, the results from these actions were rather disappointing. Only one of the consortium members has actually made an account on the platform and almost none of the contacts on Ameland were interested in setting up an experiment with crowd logistics. There was some interest in the carpool platform but this had no follow up.

RESULTS

The faculty of psychology continued to be a great partner for discussions but also arranged students that did research in carpooling and they could make use of the carpooling platform.

Two groups of bachelor student from the Hanze university of applied science applied this year to our project and they worked for almost half a year on this topic. One group worked together with the students from the university of Groningen on carpool solutions while the other group looked into different aspects of crowd logistics.

The websites and platforms did not run into any technical issues as far as we know. The statistics previously mentioned were gathered consistently during this period. The statistics show how hard it is to attract people to the Versoek platform despite advertising it in media like LinkedIn (with a reach of over 15.000 connections).

Despite more than 250 page views, only 2 people have signed up for the newsletter and only one person has created an account.

Over the years, well over 25 bachelor students have worked within the context of work package A8 and B7 of SMiLES as well as about 10 master students from the Hanze and a few from the RuG.

There were a few side project within this context as well. We have looked at bicycle parking problems and came up with several interesting concepts to solve this for the city of Groningen.

The website and platform have been well tested and are functioning as intended. The websites for both for crowd logistics and for carpooling are fully functional and are fitting the brief of the project. They have been demonstrated on many occasions within internal and external meetings and other gatherings, where they would always get plenty of interest from people.

DISCUSSION

Despite all the positive reactions from the numerous questionnaires, interviews and discussions, it turned out to be extremely hard to get people actually sign up for our newsletter or to create an account.

We knew from the start that one of the main problems would be to get enough people signing up on our platform. For this idea to work, it needs a somewhat large initial crowd, hence the name "crowd logistics". Not only should there be enough people requesting deliveries, there should also be enough people who want to deliver.

We have tried to attract people in different ways, students have come up with advertisement campaigns, we have used media channels like LinkedIn to make people aware of our platform, we have contacted people and organizations personally and shown the platform on many occasions.

It might have been a good idea to work together with existing companies who either do already deliveries or with certain groups or organisations that need deliveries during the development of this concept.

It has been an interesting journey where, over the years, well over 25 bachelor students have worked within the context of work package A8 and B7 of SMiLES as well as about 10 master students from the Hanze university as well as a couple from the university of Groningen.

There were a few side projects within this context as well. We have looked at bicycle parking problems and came up with several interesting concepts to solve this for the city of Groningen.

The website and platform have been well tested and are functioning as intended. The websites for both for crowd logistics and for carpooling are fully functional and are fitting the brief of the project. They have been demonstrated on many occasions within internal and external meetings and other gatherings, where they would always get plenty of interest from people.

RECOMMENDATIONS

The platform will continue to be online for a few more months. The code for the crowd logistics platform can be found on github and can be changed for other uses as has been shown by creating a separate platform for carpooling based on the code base of Versoek.

Our recommendation is to focus research on how people can be attracted to such a platform in order to make it successful. It might be necessary to work with other parties who can offer the platform as an alternative for delivering items.

An advertisement campaign might work, such a campaign has been developed by our students, this includes poster material, text, branding, etc. For the current project there were insufficient funds for such a large advertisement.

The carpool platform also had a lot of interest, not only from SMiLES partners but also external parties. Several meetings have taken place with the facility management of Zernike both from RuG and Hanze but they advised that the platform should become more mature before starting an extensive pilot test with their employees.

The platform is currently fully functional but hard to maintain. It is based on plain HTML/CSS/JavaScript/PHP. A more professional and modern approach could provide a method to build a more mature and scalable solution. However, the current version will be available and is created in such a way that it is easy to change, add, remove or enhance by others.

Data will continue to be collected for now. The website is scheduled to be online until the end of 2024. After this time, if no other ownership has been taken, the website will be taken offline and the data will be stored on a secure data drive.

The code, knowledge and ownership of the platform will be transferred to the Hive.Mobility innovation center for mobility in the North of the Netherlands.

CONTACT DETAILS

Primary researcher:

Matthijs Platje
Teacher/Researcher

Lectorate Digital Transformation
Digital Society Hub
Zernikepark 10, Room 1.30
9747 AN Groningen
m.platje@pl.hanze.nl

Secondary:

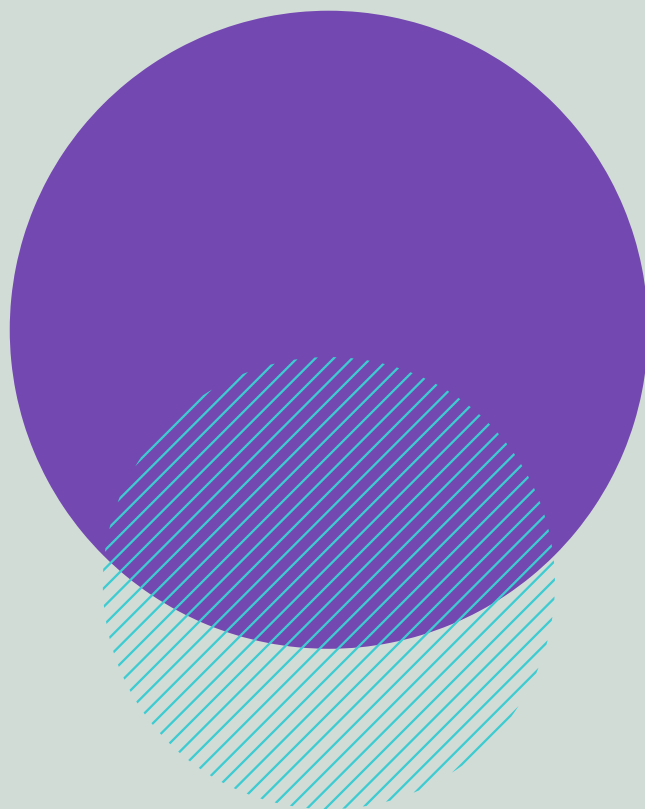
Chris Dijksterhuis
Research Coordinator Sustainable Mobility

EnTranCe
Centre of Expertise Energy
Zernikelaan 17
9747 AA Groningen
c.dijksterhuis@pl.hanze.nl

Supervising lector:

Rix Groenboom
Lector New Business & ICT

Lectoraat Digitale Transformatie
Van Doorenveste
Zernikeplein 11, D2.50a
Postbus 30030
9700 RM Groningen
h.m.groenboom@pl.hanze.nl



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