

Droppe

Project Proposal - Droppe Real-Time Demand (RTD)

Remember when all the **toilet paper** was sold out in March?

Remember when all **hand sanitizer** was sold out a couple of days later?

Remember when **facemasks** were sold out in the summer?

What if these could have been **avoided**? We know that the answer to that question is **yes**.

01. Introduction

COVID-19 and **climate change** expose dangers of unstable supply chains, and therefore old methods for monitoring supply chains are no longer valid. The web has a lot of publicly available data regarding the supply and demand of certain products during these critical times. We want to find a team to help us and our customers to make better use of that data. The project is to build a platform for **real-time demand spike monitoring** (when products are sold out of stock nationally, e.g. bottled water before a hurricane) and implement practical use cases on the platform in very interesting domains.

Droppe's service reallocates excess supplies from previous areas of crisis and finds resources and medical commodities. We call this **global load-balancing**. Our customers are **hospitals, medical wholesalers, and medical organizations** that have the need to find efficient supply chains or temporary manufacturers.

The story of Droppe began in the US when two visiting UC Berkeley students from Finland wanted to help in the midst of the current crisis. We understood that the medical distribution industry is broken. Droppe has since grown to 10 (Finland & US) people and is rapidly growing past 100 clients in Finland and additional clients in other countries.

The team that chooses Droppe will have the opportunity to learn about and directly work with a very important and current issue with a global perspective and develop a solution that will be utilised on by Droppe & companies providing essential medical supplies to the most critical organisations. **Droppe is hiring impact driven developers** to continue after the project on this and other projects.

02. Project goals

On the abstract level the project is to build a powerful and user-friendly platform for monitoring spikes in demand in real time on different aggregation levels and time periods—as an example, when all grocery stores and apothecaries radically drop in hand sanitizer stock volume in one day. The project is split into subgoals as described below (increasingly advanced stages).

Crawl & Visualise—Platform that crawls and displays the overall top-down situation on the market

- Crawls certain geographical regions' vendors (e.g. all Finnish grocery markets, e-commerce stores, wholesalers) for large volumes of near real-time data and creates a holistic picture of the current situation (retrieves meaningful data such as; demand, stock volume, price) for aggregated categories of products. Crawl, save in database, combine, analyse & visualise the obtained data. Stores historical data of the current situation for later use.

But Why?—Connecting public signals that might give hints of the underlying reasons for the change

- The platform reacts to a sudden drop in facemask volume and returns public data such as articles & tweets (e.g. mentioning "mandatory facemask THL") as explanation for the sudden spike in demand. Other solutions have existing implementations of the same but an explorative approach to figure out what works in practice is required for implementing a solution for the said domain.

And tomorrow?—Predictions that leverage existing ML algorithms and data from previous stages

- Real additional value can be found from further uses of the collected data. This subgoal gives the team extremely free hands for exploratory value creation and implementation of algorithms from other domains. For example, trends and patterns in demand spikes could be found from the data and used for future prediction (What happens in a day, a week, a month? Will the demand spread to other products? Which ones?). Algorithms can be improved and evolved depending on the team's situation with weak signals and weak-correlation (mask+hand sanitizer signals something different than hand sanitizer+camping tent). This is a far reaching and advanced subgoal for very ambitious teams.

03. Technologies

The team can propose the technologies they are most familiar with or which would suit the project goals best. The platform should be a browser based application (preferably React, Node, etc.). Familiarity with cloud services (AWS, Azure) will be helpful for students.

We expect use of git as version control (GitHub) and proper public CI tools (e.g. Travis) for testing and deploying the software. Code reviews in the form of pull requests. Additionally, the code must be well documented, tested and additional documentation of the system constructed as a part of the project. Some Data Science / Machine Learning experience is a strong bonus.

04. Requirements for the students

Important qualities:

00. First and foremost we look for impact driven, motivated & ambitious developers who want to learn in a completely new field.
01. Open minded & flexible, it's very likely in these projects that the scope changes possibly multiple times. Vision that extends over the very next project subgoal, an eye for the bigger picture.
02. Clear & honest communication—something that we will repay by honoring also in your direction.
03. Working as a team—this is how all successful software project teams have worked.
04. Willingness to question things—what to build and why to build it, ways of working, processes, tedious tasks.
05. Being creative & challenging the status quo—this is not the easiest project—but one that might have the highest potential, and as such requires a high amount of creativity and grit.
06. Being brave, showing your skillset & still be willing to learn new things.

We also appreciate close co-operation with the Droppe & stakeholders to allow for the optimal direction of the project. Project difficulty level is moderate (first stage) / demanding (later escalating to very demanding).

05. Legal Issues

Intellectual Property Rights (IPR):

- (2.) The client gets all IPRs to the results.

Confidentiality:

- (1.) Signing the NDA included in the Aalto's contract template is required. The client might share some confidential information with the students in order to enable the student team to work with enough knowledge to guarantee success in the project. No other legal issues.

06. Client

The team will be given a cloud server to develop and run the application.

Spaces for meetings or working might be available depending on how the corona situation evolves in Finland & the current company guidelines. Currently all meetings at Droppe are held remotely.

However, we accept that Scrum meetings can take place outside the office hours during the evenings or weekends, if it is more convenient to the team. In addition, the use of hackathon / code sprint / specified office days is greatly encouraged (success oriented approach in previous SWP projects).

Client representative(s)

Henrik Helenius will be the Project Owner & technical stakeholder in the project and can support in web technologies if needed. He is very familiar with the Aalto SWP as he acted as the **Scrum Master** (and part time developer) in Software Project 2018 and was awarded with the **Accenture Software Quality Award** for Sievo's Feedbacker Forum.

Henrik Helenius, technical stakeholder,
henrik@droppe.fi, +358 440 889 676

Johannes Salmisaari, financial stakeholder,
johannes@droppe.fi, +1 424 450 8192

Both Johannes & Henrik are well experienced with the domain of the project. The outcome of the project has real value to our business and we are committed to supporting the project team as required. We believe that communication and staying in sync is key and as such both the student group and we get the most benefit by discussing the project regularly on a biweekly or weekly basis.

Preselected Student Team Members

- None

07. Additional information

Technical implementation, documentation, and source code must be written in English.

If you have any questions regarding this project, please do not hesitate to contact the client representatives. As mentioned, the Product Owner has participated in this course before, and should be able to answer any related questions you might have. We are happy to discuss the proposal further in a casual setting, for example: henrik@droppe.fi or @henrikhelenius on telegram.

We're actively hiring ambitious and impact driven talented developers, a good skill set, plain enthusiasm & true passion to solve big problems—such as the current crisis—with tech is what we appreciate the most. This is a great opportunity for us to get to know each other and for you to learn more about Droppe and the mission-driven and unrivaled environment for curious people we aim to nurture!

We want You to succeed together with us and therefore a **successful completion of the project will be celebrated**.

Find out more about us and our story online at <https://droppe.fi/>