

# Project Proposal – Student Data Visualization

## Introduction

Students are able to study our material in the subjects Math, Chemistry, Biology and Physics through our own application, [Mafynetti](#). As such, we are able to collect progress-related data for individual students as well as groups of students. Basic examples include which exercises students have successfully completed, failed, if they viewed any hints and how much time a student has spent studying.

As we are now offering our application and digital material as a replacement for the study material used in High School courses, a need for visualizing the data in a way that High School teachers can easily view and digest has emerged. By keeping up with the progress of their class, High School teachers are able to tailor their teaching to the specific needs of the group by identifying which areas the students master and which areas they are weaker in.

Your task is to make this possible by creating a web application that requests progress-related data from our REST API, processes it and visualizes it for the High School teachers!

## Project

Since our customer base is as wide as the entirety of High School teachers in all of Finland (and possibly elsewhere!), it is crucial that the solution works well regardless of the teacher's individual digital environment. Therefore, a modern web application is an ideal solution to the problem.

We already have an existing web application with some functionality that can be used as a reference point, though in this project you will be setting up the project from scratch, with the assistance of our software developers if necessary. This gives you a clean slate to build the web application on using the latest technologies available.

Based on our REST API documentation, which describes the available endpoints and data you are able to request, you will then start building a modern web application.

We have a list of requirements to fulfill, but we challenge you to come up with the best implementation and way of visualizing the data. We will keep the project scope flexible, as such the team is welcome to suggest further additions to the web application based on the available endpoints and data, should

interesting ideas arise! Another way of further expanding the project is to also provide data regarding the study material to our own material developers.

## Technologies

We require that the User Interface (UI) is built using a React version greater than or equal to 16.8.0. The reason for this requirement is that our other projects, for instance Mafynetti, is built using React and React-Native. By keeping our tech-stack slim, we are able to re-use code between projects and allow developers to more easily work on different projects.

Within the context of React, we welcome a discussion with regards to UI-frameworks, state-management libraries etc.

For version control we mainly use Git and GitLab.

## Requirements for the students

Knowledge of the following is helpful, but not required:

- React, particularly recent concepts such as hooks and contexts.
- ECMAScript 6, TypeScript.
- Continuous Integration practices.
- Basic knowledge of HTTP-request and REST APIs.
- Use of version control tools such as Git and GitLab.

The most valuable qualities the student team can have are the willingness to learn and the eagerness to take initiative. Facebook's documentation of React is top-notch and plenty of guides and resources are available online, which facilitates learning throughout the project.

## Legal issues

Signing an NDA is required. This allows us the convenience of possibly re-using code from our other React projects, as well as allowing you to more closely inspect the existing web application if necessary. We may also be able to provide you work spaces at our offices, but since our courses are starting there will be a lot of students on the premises and (quiet) work spaces may be in short supply.

The client retains all IPRs to the results.

## Client

[MAFY-valmennus](#) is a growing company based in Ruoholahti, Helsinki, employing around 30 people. We offer preparatory courses for university entrance examinations, as well as the high school matriculation exam. Our software is also offered as study material for individual high school courses and self-studies.

In recent years, we have emerged as the leading provider of preparatory courses for those aspiring to study medicine, whom have historically been our main base of customers. In 2019, the following percentages of students admitted to the respective universities for medicine studies attended our courses:

- Helsinki yleinen: **67%**
- Helsinki yleinen ruotsinkielinen: **46%** (despite not yet offering courses in Swedish)
- Tampere yleinen: **65%**
- All new medicine students in Finland: **60%**

Currently, our main focus is adapting our study material and software for use in High Schools. **60%** of the High Schools in the capital region are already our customers.

MAFY-valmennus will have the following representatives partake in the project:

### Product Owner (PO):

Zacharias Levander, Partner & Full Stack Software Developer

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### Technical Support and expertise:

Matti Virolainen, Partner & Full Stack Software Developer

## Additional information

The goal of this project is to meet an existing customer need that MAFY-valmennus has identified. We intend to deliver the resulting software to our end-users, possibly after continued development and refinement throughout the summer of 2020. As such, we are very much interested in offering summer internships and possible further employment to motivated students! The PO initially started working for MAFY-valmennus following the 2016-2017 Software Project, and following our 2018-2019 Software Project we gained 2 summer interns, who will both continue with part-time work during their studies.