

# Business Intelligence Web Portal

Anna Furugård (annfu090@student.liu.se)

## Project Description

Senion is a high-tech company developing indoor positioning technology which is used to streamline office workplaces. Their positioning technology is coupled with calendar data to help employees find and schedule meeting rooms.

Senion continuously collects anonymous usage data from customers. The data contains information about how services and systems are used. A visualization tool was needed to present the data in an intuitive way. The goal of the project was to implement a first version of this visualization tool in the form of an internal web page accessible by employees at Senion.

### Information Visualization

Information visualization is used when representing abstract data in such a way that it is easy to understand for a human. A well-known example of this is *Google Maps*, which is a tool that, among other things, can help users read and navigate maps.

Information visualization is often used for large data sets, allowing the viewer to understand, interpret and compare the data. This can be applied to many fields. This project focuses on data related to business intelligence.

## Visualization Methods

Various methods were implemented in order to visualize the customer data:

- A scrollable **list** was implemented which allows the user to sort the data by individual field values.
- A **bar chart** was implemented which allows the user to quickly compare and quantify the data.

## Implementation

In order to implement the tool it was necessary to collect relevant data from existing databases, forward it to an internal web application and present it accordingly.

The interactive visualization was implemented as a web application, where the front-end was developed using *React* and *TypeScript*, and *Java* and *Kotlin* was used as microservices. The customer data was stored in a *MySQL-database* which was split into subsets to make it easier to process, and visualized using *D3* which is an open-source JavaScript library used for interactive visualizations.

Figure 1 displays a mockup (with dummy data) developed at the start of the project. The mockup was used as a springboard to determine what visualization methods should be used, and proved to be very useful.

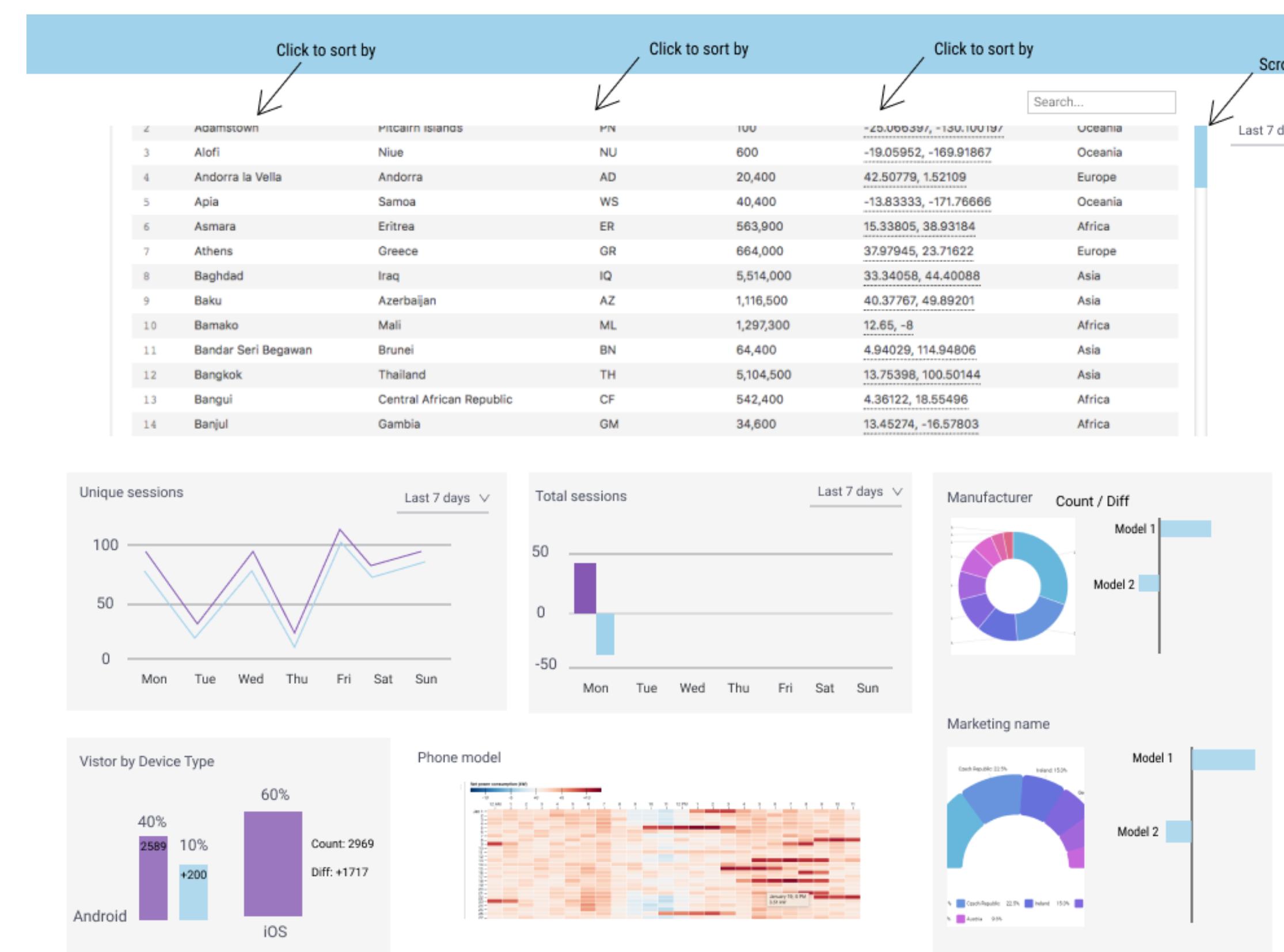


Figure 1. A mockup of the visualization.

## Result

The result of the project is an interactive web application that can visualize customer data in various ways. Since the target group of the application was employees at Senion, knowledge of the data set was assumed.

The application was developed with modularity in mind, and specific aspects of the desired functionality are handled by sub-modules. The purpose of this was to simplify future development.

### Conclusions & Future Work

- The visualization tool was able to improve employee user experience when viewing customer data, while also providing a solid foundation for future improvements.
- Data sets containing a large number of variables required effective data processing to not affect the application negatively.
- Some visualizations might still be improved with text labels even though the user is already familiar with the data.