



Conception and implementation of a documentation system

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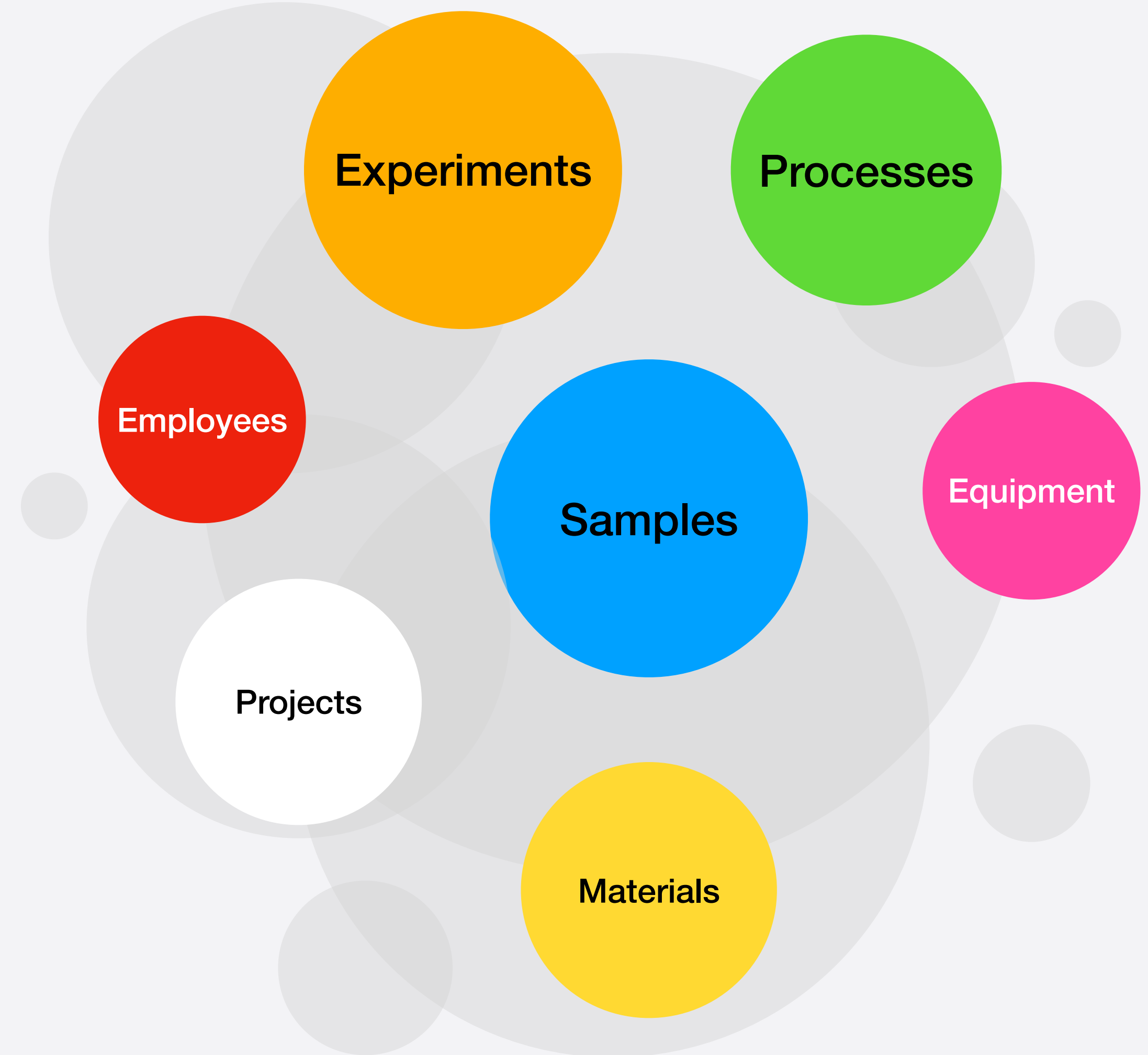
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Project

Introduction

- The PVM department at Fraunhofer ISE works on the development and manufacture of photovoltaic modules
- Experiments, samples and other parameters involved must be documented
- So far only samples and materials are documented in a excel sheet
- The new system combines libraries for all entries involved and supports standardised recording
- Implementation in the form of a web application with database connection



Requirements Engineering

Procedure

Methods

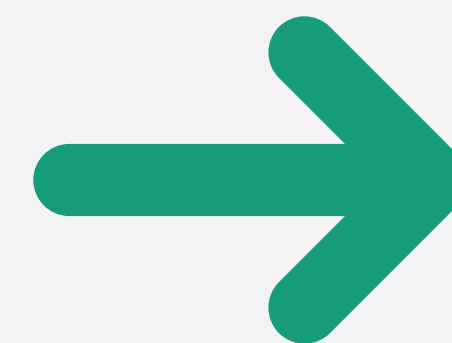
Analysis of the current state



Interviews



Online survey



Models

Visions and goals



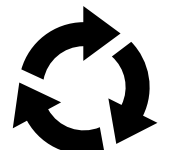
Use Cases



User Stories



Processes



Specification



Atomic requirements



Design GUI

- User-Centered Design
- User Interface in the form of wireframes
- Click prototype to validate usability and process flows
- Cognitive-Walkthrough Method

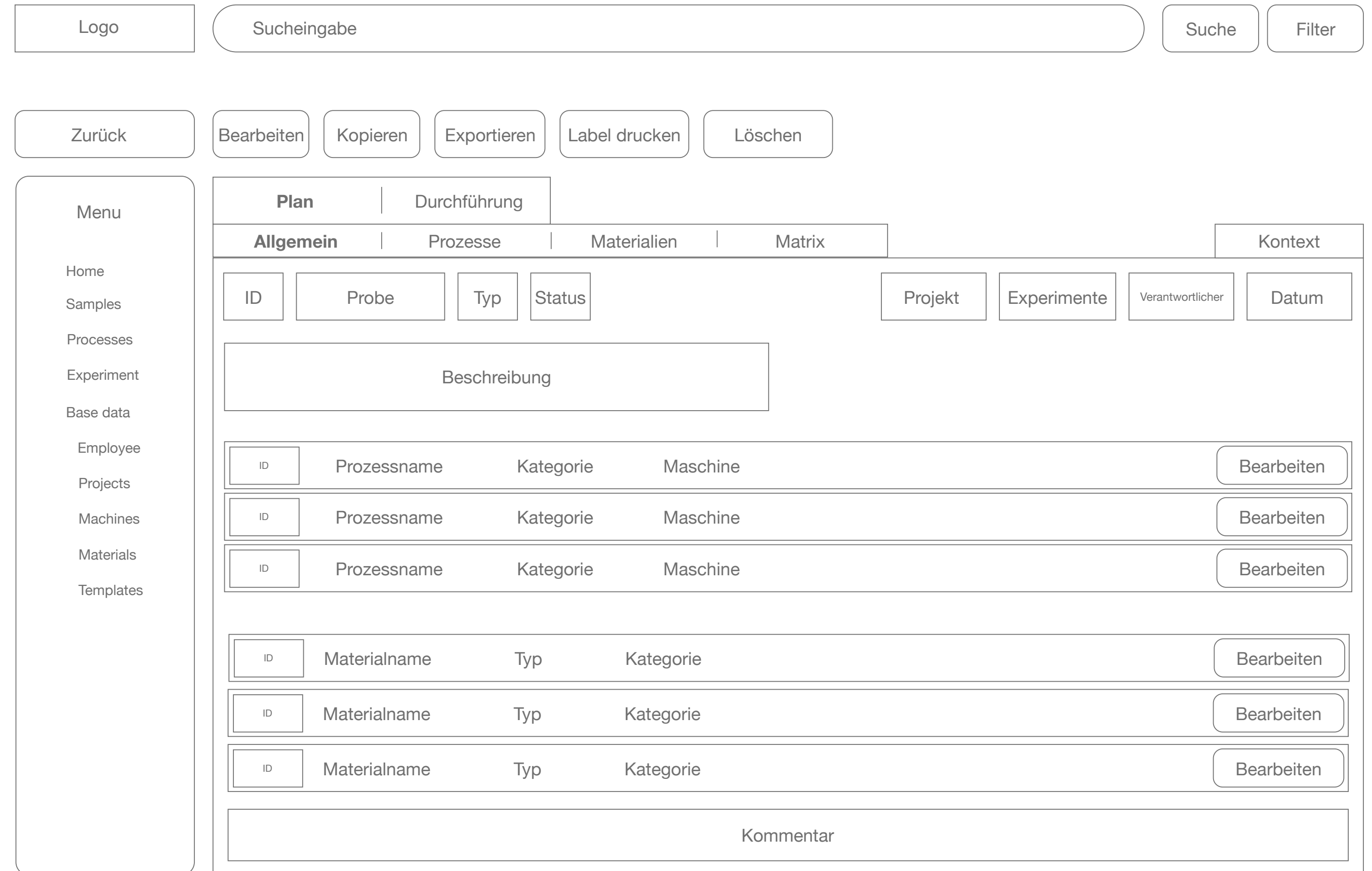


Figure 1: Wireframes Detailpage sample

Design GUI

- Development of the Corporate Design
- Division into list, detail and editing view
- Appearance is based on real documentation (e.g. files)
- Color coding for the different entry types

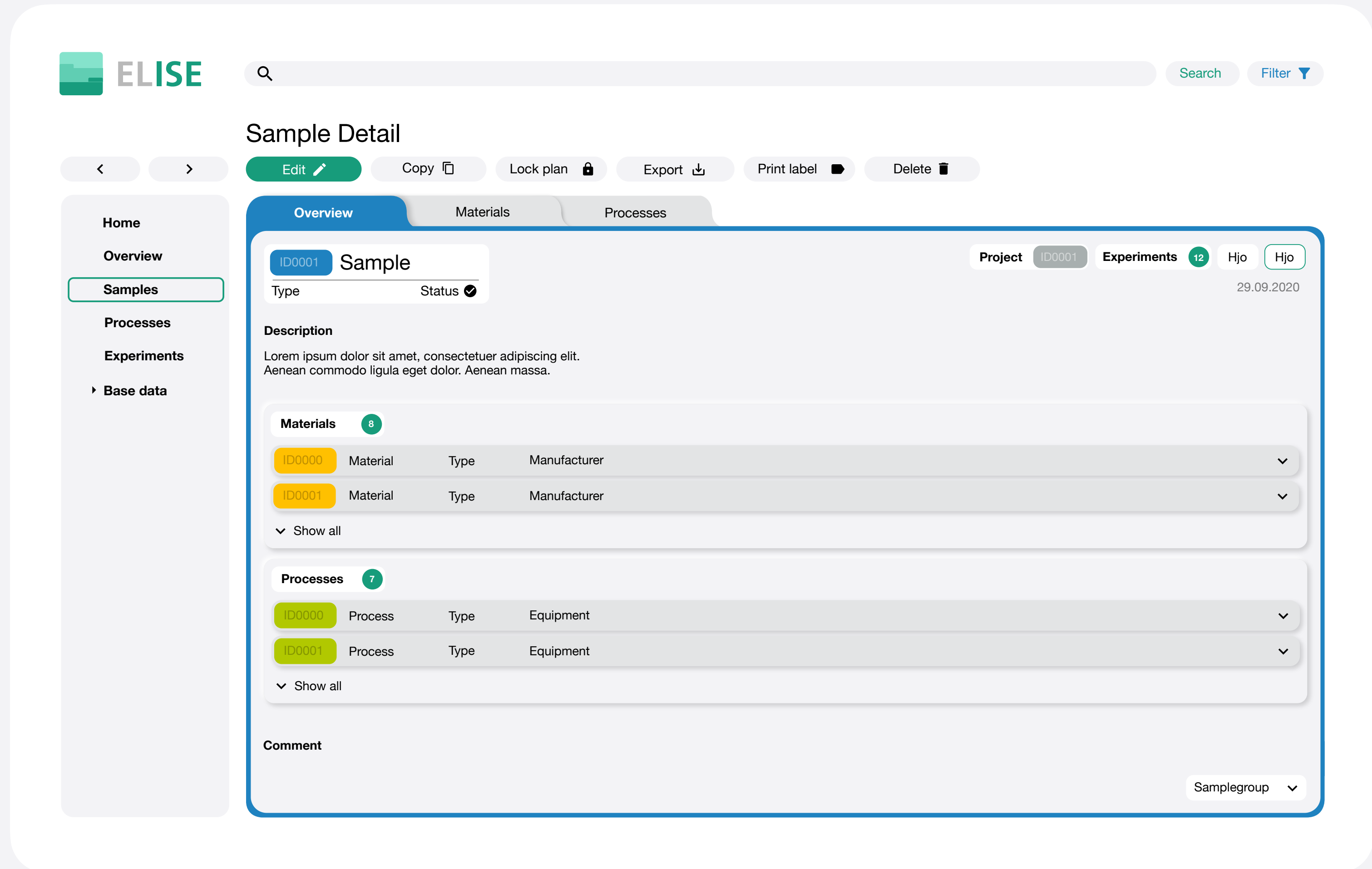


Figure 2: Screendesign Detailpage sample

Design Technologies

- Orientation towards the technologies of an already existing tool at Fraunhofer ISE
- Graph-database Neo4j for maximum flexibility
- GraphQL with Apollo for simplified querying and manipulation of data
- Vue.js as JavaScript frontend framework

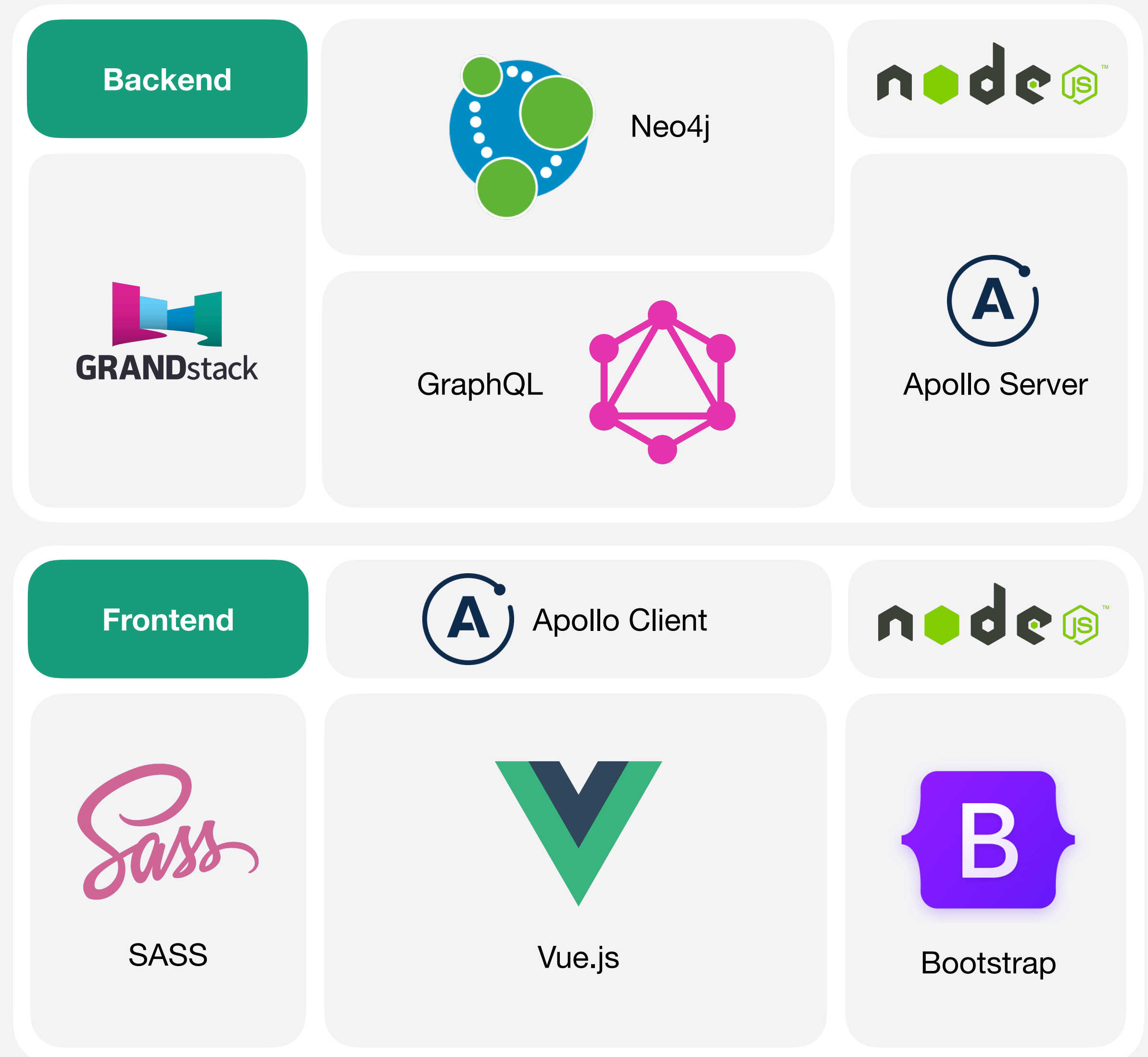


Figure 3: Technologies

Implementation

Backend

- Backend based on Express + Apollo Server
- Graph-database neo4j
- Offers high flexibility
- Automatic generation of the API from the schema + own endpoints
- Provision of the API using GraphQL

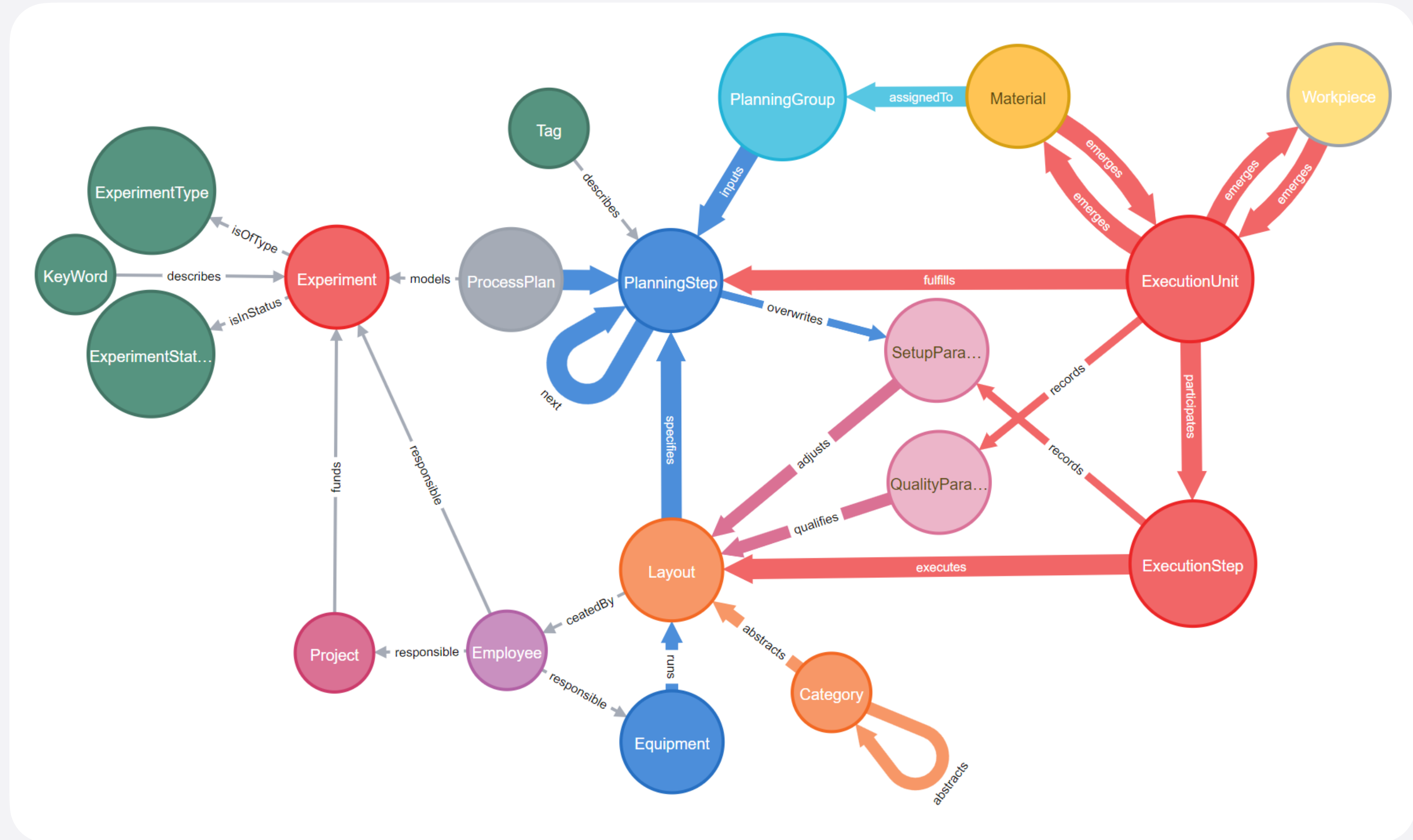
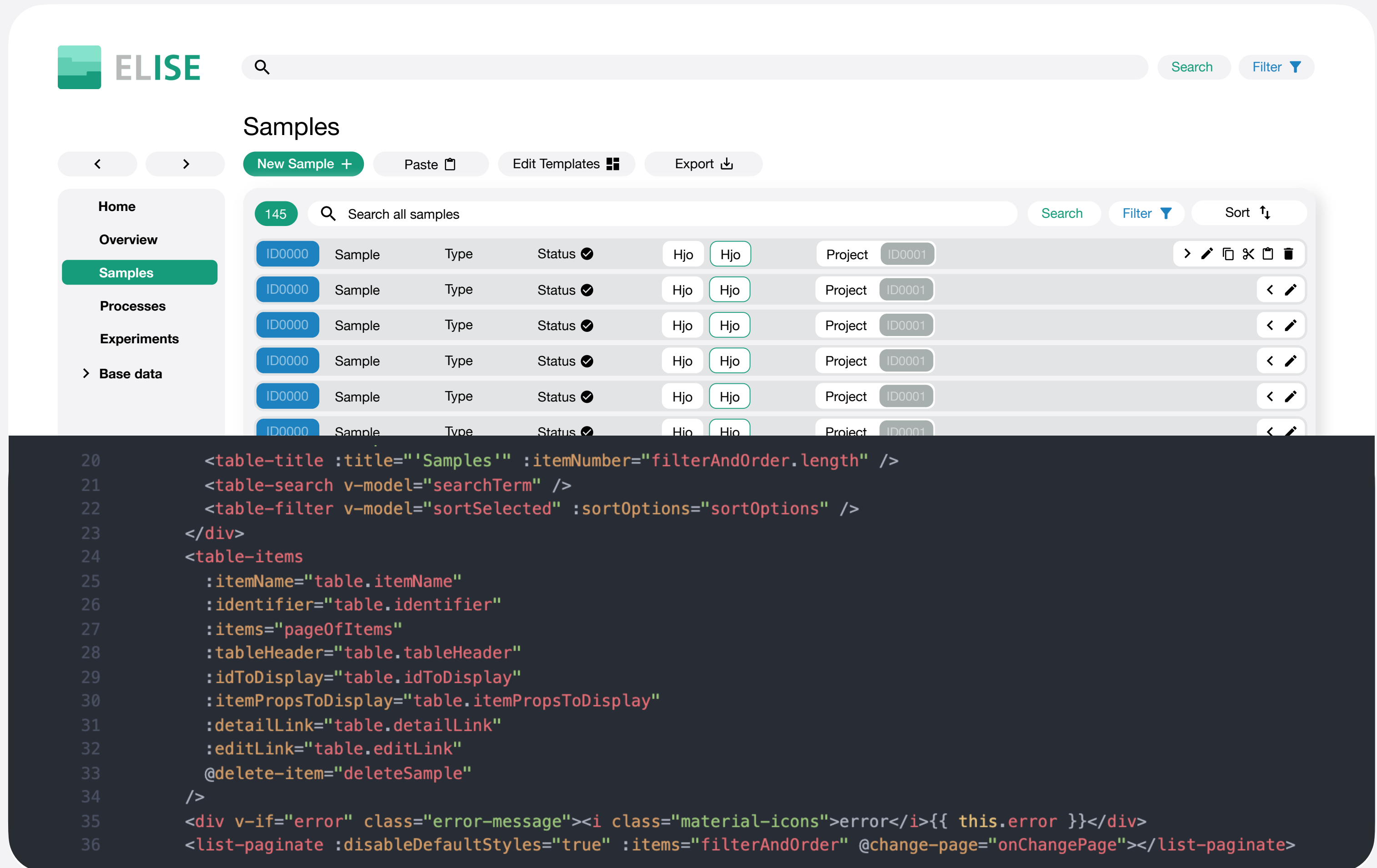


Figure 4: Data Structure as Graph Model

Implementation

Frontend

- Web-App based on Vue.js
- Component-based development for maximum reusability
- Apollo Client for simplified data querying and manipulation as well as smart caching



```
20 <table-title :title="'Samples'" :itemNumber="filterAndOrder.length" />
21 <table-search v-model="searchTerm" />
22 <table-filter v-model="sortSelected" :sortOptions="sortOptions" />
23 </div>
24 <table-items
25   :itemName="table.itemName"
26   :identifier="table.identifier"
27   :items="pageOfItems"
28   :tableHeader="table.tableHeader"
29   :idToDisplay="table.idToDisplay"
30   :itemPropsToDisplay="table.itemPropsToDisplay"
31   :detailLink="table.detailLink"
32   :editLink="table.editLink"
33   @delete-item="deleteSample"
34 />
35 <div v-if="error" class="error-message"><i class="material-icons">error</i>{{ this.error }}</div>
36 <list-paginate :disableDefaultStyles="true" :items="filterAndOrder" @change-page="onChangePage"></list-paginate>
```

Figure 5: Frontend Listview sample

Prospect

Further development of ELISE

- Maintenance of the base data
- Employee training
- Use in the documentation process of the module simulation department
- Continuous development and improvement