

# Project Proposal

## Digital Door Sign

Project Name	Template
Project Leader	G.S. Panturu
Document state	In process
Version	0.5

# Contents

1	Introduction	3
2	Initial Situation	4
3	General Conditions and Constraints	6
4	Project Objectives and System Concepts	7
5	Opportunities and Risks	9
6	Planning	11

# 1 Introduction

The technical college in Leonding (Upper Austria) is a high school with four departments:

- Informatics
- Media technology
- Medicine technology
- Electronics

Our school has over 1000 students and over 100 teachers.

For a technical college is very important to have a modern design. In the last few years our school has been renovated outside and some rooms on the inside.

It is also very important to be up to date with new technologies that can be used in buildings, that can let our school look more modern and can let people find rooms easier, especially during open-door days for new pupils and people interested in our school.

That's why we want to start using a digital signage system which lets people see which rooms are being used and which not, when and where events like tests or seminars are taking place.

This project is based on two preliminary projects, one using tablets as digital door signs and one using E-Papers.

## 2 Initial Situation

There are different types of rooms in our school. Each room is tagged by a sheet of paper telling different information, depending on the room type.

The most common room types are: departments:

- Classrooms

These rooms' signage contains the room number, the main class that is usually in there and the form teacher.

- Computer rooms

The computer rooms' signage currently contains only the room number, the computer room's name and the room's department (e.g. informatics). The schedule is pinned on the door.

- Teachers' rooms

These rooms have multiple teachers with their name and picture.

- Special purpose rooms

The physics and chemistry rooms are used for lessons in these subjects. Furthermore, they are sometimes used as special rooms for holding tests.

- Assembly hall

This room is used for the final exams and special events.

- Workshops

These rooms have a different signage compared to the classrooms. They only contain the room number and the room name. Some of them have symbols for the rules that have to be followed (e.g. wearing work clothing or safety glasses). Other rooms have a special schedule that is divided in morning and afternoon lessons.

- Meeting room (E26, ILB, ...)

Rooms with no regular schedule, booked for single events.

Currently all our rooms and events do not have a concrete signage showing which events are currently taking place. Even worse, one may not rely on the regular schedule shown at the doors.

Figure 1: Classroom



Figure 2: Computer room



Figure 3: Workshop rooms



Moreover, it happens that teachers spontaneously need a computer room, a special purpose room, a workshop, etc. for their lessons. Searching for one in WebUntis is time-consuming and knocking at all the room door to see if the room is occupied is pretty disturbing during regular lessons, not to mention situations where tests or exams take place.

### 3 General Conditions and Constraints

#### Our know-how:

- Java
- Angular
- mySQL
- C++

There are two different prototypes available from preceding projects:  
one using tablets and another using E-Paper devices.

We can cooperate with two other teams that worked on the previous versions of this project. Both projects aren't finished yet. Furthermore, the final outcome of this project is not defined yet. E-Paper devices and tablets have a different backend, which has to be merged in order to combine both projects.

Furthermore, these services have to be used:

- WebUntis – currently the regular schedule plus some of the extra events are planned/maintained in WebUntis. Unfortunately, the extra events are not completely planned in WebUntis (e.g. the final exams are rarely scheduled since they always take place in the same rooms). First investigations have shown that the clumsy user interface for entering events is the reason why teachers hardly ever schedule their extra events, nevertheless this tool plays a central role in scheduling of courses and events at the HTL and has to be part of a future solution for a digital signage.
- WebUntis API: WebUntis offers a sort of user interface to the internal data model. In order to integrate WebUntis into our new system this API has to be used.

## 4 Project Objectives and System Concepts

The content of the door signs depends on the situation whether the room is part of a special event or not. Most of the rooms have a regular schedule and serve the lectures and courses. In case of special events (FIT, Open Doors Day, ...) the purpose may change and, therefore, the content of the digital door signs also has to change.

### Computer rooms

The door sign at the IT-Rooms will display in addition to the room number and the weekly schedule events currently happening.

The physics/chemistry rooms can also be considered as an IT room since we want to display the weekly schedule.

### Teacher rooms

The teacher's sign will display every teacher located in the room, their name, their current location (or if they're not having any lessons at the time) and the consultation hours of each teacher.

### Classrooms

The classroom signs will display

- the room number,
- the main class and its form teacher,
- the current location of the main class (if anywhere else),
- the current class in that room,
- the current subject,
- the current teacher,
- special sign during an exam and
- when the class is split it shows the room where the rest of the class currently is.



Figure 4: Classroom view - example



Figure 5: Workshop view - example

## Workshop rooms

These rooms have different names like “Hochfrequenz- und Nachrichtentechnik”. These names must be displayed along with the room number. Furthermore, symbols for the rules that have to be followed (e.g. wearing work clothing or safety glasses) also must be showed. Some rooms have a schedule with the lessons in the morning and in the afternoon. The class and the teachers also have to be showed in this schedule.

## Special rooms and events

Depending on the room, there will be information displayed about the current lesson/event/test taking place, accompanied by the room’s name (e.g. “Physiksaal”).

There are currently 2 types of special rooms:

- The multipurpose hall (room number E26)
- Rooms used for events like open-doors days

There are mostly events like presentations, project awards or even the oral final exam taking place. All these events can have the same interface.

There is a variety of other events that are yearly taking place in our school. The most important events that need a special interface are:

- Open doors’ day
- FIT (Firmeninformationstag)
- Parent conference day: every year the students’ parents are invited to conferences with the teachers in order to talk about their children. Every teacher is in a room and has a schedule with all the parents that want to talk to him/her. This schedule can be digitalized and be put on the tablets.

Other events like Girls’ Day, IoT (lessons taking place on Saturdays) or the so-called “Schnupperprogrammieren” can also have the same interface as FIT.

## Digital Doorsigns Admin Page

ID	Name	Mac Address	Room	Type		
7	Not initialized	C0-84-D2-BB-45-F3	?	Unknown	<button>Edit</button>	<button>Delete</button>
8	Not initialized	A4-4A-A2-A4-FC-70	?	Unknown	<button>Edit</button>	<button>Delete</button>
1	Samsung p-100	6C-06-60-CE-BC-EC	E74	Lehrerraum	<button>Edit</button>	<button>Delete</button>
2	Huawei 1003-c4	FF-21-BE-BF-12-34	206	Lehrerraum	<button>Edit</button>	<button>Delete</button>
3	Samsung p-100	C0-88-D2-BB-45-F3	154	Klasse	<button>Edit</button>	<button>Delete</button>
4	Samsung p-100	A4-4A-A9-A4-FC-70	120	Klasse	<button>Edit</button>	<button>Delete</button>
5	Samsung p-100	E0-55-A8-71-F9-3C	119	Klasse	<button>Edit</button>	<button>Delete</button>
6	Samsung p-100	F1-F2-5B-03-AA-69	123	EDV	<button>Edit</button>	<button>Delete</button>

Figure 6: Admin Page view

### Admin Page

There already exists an admin interface made by a preliminary project. This admin interface is used to log in the tablets for the first time and to choose which room type has to be shown on each table.

If there is an event taking place in the school (e.g. Open Doors Day), a so-called “Event Mode” should be able to be started. Then the admin should be able to choose the tablets he needs for the events and choose between a variety of events. For each tablet, he will be able to insert the title of the event that is taking place in each room and, depending on the event, there will also be the possibility to add a description of the event.

### Central view

By the entrance of our school we want a bigger display that will show

- current events (e.g. workshops) in our school and the rooms where they take place.

## 5 Opportunities and Risks

The project has the following **opportunities**:

- Teachers save time when searching for free rooms
- Classrooms that are taking tests are not disturbed during them
- Students searching for teachers know immediately where the teachers are by looking at their current location on the tablet
- When wanting to use a computer room, the weekly schedule will show on the table in order to see at which time the room is free

- People that are not familiar with our rooms can easily find what they search for. Furthermore our solution offers flexibility regarding the events that take place in our schools since we design multiple designs which can be chosen depending on the event.
- More modern look of our school

The following **risks** are:

- Vandalism – students can damage the tablets/E-Paper devices
- Hacking
- Power supply (Tablets consume a lot of energy. Also, in the case of power failure, the tablets/E-Paper won't work)
- WebUntis has a clumsy user interface. This is the main reason why most teacher don't like scheduling their events into WebUntis. Our solution will currently just supports him/her in finding available rooms faster.
- Since we have over 100 rooms in our school, providing every classroom with a tablet can become pretty expensive

Potential **customers**:

Our school and other schools that like our solution and also use WebUntis.

## 6 Planning

### Milestones:

Project Proposal	25.10.2019
Views examples for all rooms/events	3.11.2019
Poster (draft) with views for presentation scopes	4.11.2019
Ready poster for presentation scopes	11.11.2019

### Needed resources:

- A WebUntis account
- Tablets
- E-Paper devices
- ESP32 Micro Controllers

### Team structure:

Developer/ team leader	Gloria Sara Panturu
Developer	Felix Bogengruber
Developer	Belmin Coralic
Developer	Janine Höllhuber

### What needs to be done:

- Create an admin page for the E-Paper devices
- Update the current admin page in order to add support for the special events
- Create views for all the special events
- Create views for the workshop rooms