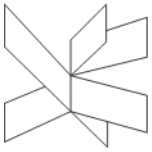

PROJECT DESCRIPTION

Students

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2. Andrei Cioanca (266105)

3. Claudiu Rediu (266129)

4. Dominika Kubicz (266148)

5. Flemming Vindelev (251398)

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7. Mihail Kanchev (266106)

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Supervisors

Erland Ketil Larsen

Kasper Knop Rasmussen

Knud Erik Rasmussen

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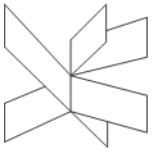

Contents

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1. Background Description

A library is a collection of information and resources that are made accessible to a community for reference and borrowing. Libraries provide either physical or digital access to various materials. As a place where people can spend their time, regardless if it is in a room or the library building itself, it is important to maintain comfort. (Merriam-Webster, 2019; Lawrence, 1997) As mentioned in (educationcorner, 2019), is it counterproductive to study for extended hours at a time in an uncomfortable environment. The library fulfils the needs of most people in creating a proper environment for learning because they offer individual cubicles, group study rooms, tables, couches and other resources. These studying areas should be kept under close watch as to maintain the best conditions for the people inside it.

There are two sides to libraries, the books and the people inside the library. Both are affected by the humidity, however the people inside are also susceptible to variations in temperature and CO2 levels. For humans, high humidity together with high temperature can lead to a rise in the core temperature, which makes the body work harder to cool itself down. On the other hand, low humidity increases water loss through skin and respiration leading to dry eyes, sore throat, dry skin and many other symptoms (Allergy, 2019). Several studies conducted indicate that CO2 commonly present indoors can impair cognitive function. It is relevant for the efficiency of the people inside the library to keep the CO2 levels below 1000 ppm (parts per million). Reducing high levels of CO2, reduced the instances of headaches and tiredness while improving the satisfaction (ecoadmin, 2016).

In the case of books, controlling the temperature and relative humidity is important to preserve the state of the library. Heat accelerates deterioration, and every increase in temperature of 10° C doubles the rate of deterioration. High relative humidity in the air contains moisture that can cause damaging chemical reactions. Extremely low relative humidity can lead to drying and cracks in the book's material. Temperature and relative humidity should be measured and recorded to support the documentation of current environmental conditions (Ogden, 2019).

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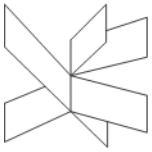

Libraries are lacking a way to monitor information related to temperature, humidity and CO2 levels to create a better environment for books and people.

2. Definition of purpose

The purpose of the project is to monitor the environment of the library and provide information in a coherent manner to the users.

3. Problem Statement

Below, there are questions that encompass the final goal of the project.

Overall Question: How would technology aid in monitoring the climate of libraries?

Specific Question: How do we present the necessary information to the users?

Specific Question: What are the relevant climate properties to monitor?

Specific Question: Which technology would be appropriate for the project?

4. Delimitation

- The interior climate conditions will not be affected

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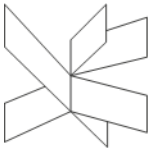

5. Choice of models and methods

What?	Why?	Which?
What should be used to present the necessary information to the users?	To display relevant information in a user-friendly manner	An application on a mobile operating system
What should be used to monitor relevant climate properties?	To gather and interpret data about relevant climate properties	A document-oriented database program, a relational database management system, open-source hardware and software
What technology would be appropriate for gathering the data?	To better understand the role of each technological component	Various sensors coupled with microcontroller platform

6. Time Schedule

5 ECTS = 137.5 Hours per Student

1237.5 hours in total (9 students)

Start of the sprints: 25th of February 2019

Each sprint will be composed of 5 days, 3 hours per person

135 hours per week for all the team

Week 8: Inception starts (2 sprints)

Week 10: Elaboration starts (4 sprints)

Week 14: Construction starts (4 sprints)

Week 18: Transition starts (2 sprints)

Project Deadline: 15th of May 2019

11 Sprints in total

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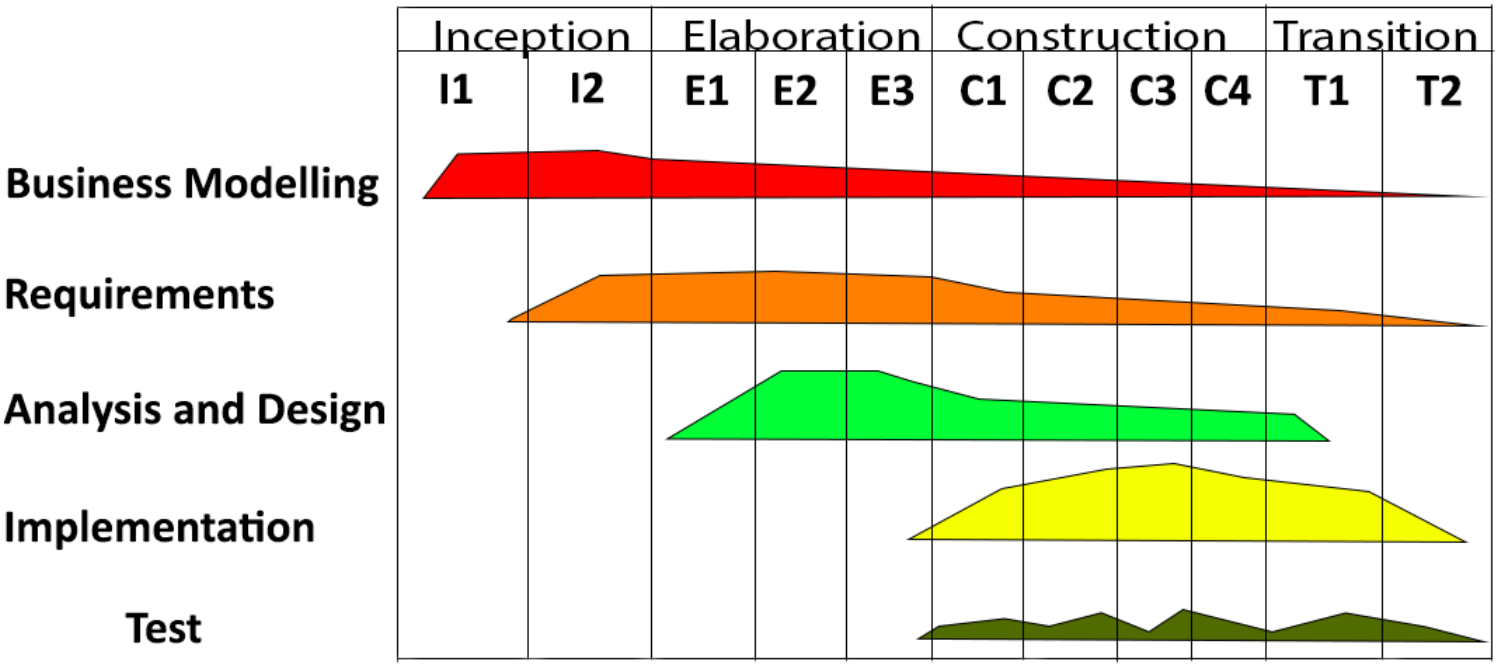

Each iteration approximates what would be done in the sprints.

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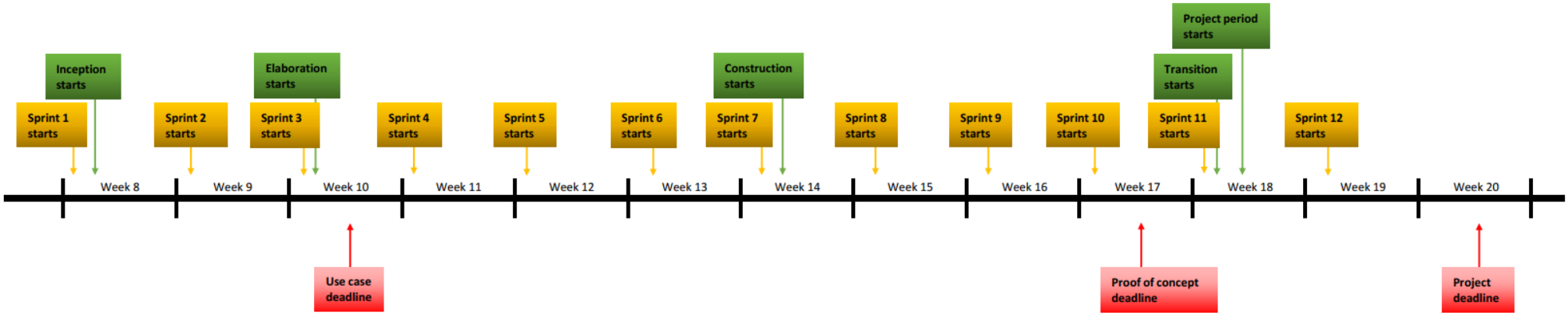

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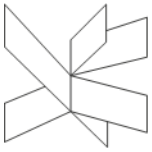

7. Risk Assessment

Risk	**Description**	**Likelihood** Scale **1-5** 5 = high risk	**Severity** Scale **1-5** 5 = high risk	**Risk mitigation** e.g. Preventive & Responsive actions	**Identifiers**	**Responsible**
Risk not to meet the requirements	Lack of time poorly made schedule, insufficient knowledge;	2	5	Preventive: Proper management of the requirements; Respect the schedule; Responsive: Accomplish what was agreed on;	Being behind the schedule;	Andrei
Technical issues	Software crashes, broken computers, unsaved files;	2	5	Preventive: Having everything backed up on GitHub; Responsive: Restore data from GitHub;	Corrupt data;	Claudiu
Injuries or illness	Seasonal viruses, bicycle accidents;	3	2	Responsive: Work from home;		Dominika
Insufficient knowledge in software development	Lack of knowledge in networking and web services;	2	4	Preventive: Read additional materials and keep up with class exercises;		Stefan
Group conflicts	Fights and disagreements between members;	1	4	Preventive: Follow Group Contract; Responsive: Try to compromise;		Nikita

8. Sources of Information

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