Pre-project report

Development of Makerspace Management System
Group BO17-G14

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The group

Thomas Magelssen Bergby

A student who has been interested in everything regarding IT and technology since he was a kid. Thomas has been a leader for "Lær Kidsa Koding" (A group of students who teach coding for kids) and a leader for student assistants in web-development and JavaScript courses.

Thomas studies Informatics, and has gained skills within JavaScript, Java, PHP, CSS, Linux and Python. During his studies, he has taken courses like

- Algorithms and data-structures
- Software Engineering
- Object Oriented Programming
- Android Programming

He also enjoys traveling, and hopes to eventually get a job in the United Kingdom or USA.

Nicolai Naglestad

Studied International Baccalaureate at Skagerak International School in Sandefjord. Nicolai has an above average interest in technology and is always looking for something new to learn. Beside his studies he works as a student assistant in the subjects introduction to programming, web development, object-oriented programming and lastly he works at the schools MakerSpace where the latter is a position where he helps students get started on projects and with the use of the 3D printers. Nicolai has great interest with most aspects the are to be found inside the MakerSpace and you will find him there mosty of the time.

Nicolai studies digital media production at Østfold University College, but has taken subjects such as OOP, Software Engineering and .NET. He also enjoys learning new systems and languages.

Espen Ottar Skjeggestad

He has a broad field of interest, but the main one is IT and Biology. He is an active person that likes jogging, training, diving and trips. He is also politically active in the student politics and has roles as elected representative for the class, member of the student counsel and member of the executive committee for the student-democracy. He is currently a student vara-member of the University College Board. In work roles he was a student assistant for GRIT and is now working at the school library.

Espen studies information-systems with focus on IT and code, but also includes business leadership and classes about economy.

Employer

The employer for this project is MakerSpace (MS) which is a room located in Østfold University College (HiØ). The MakerSpace is a playroom for creating all types of technology, everything from electronics and robotics, to programming and 3D-printing. The room is currently funded and managed by the IT department.

Here, students and lecturers can use the rooms equipment to experiment with technology to further educate themselves within topics that they find interesting, and that are not necessarily related to any ongoing subject at the university college. The space is open for all students and staff of the university college, but is mainly used by the IT department.

The employers for this project are Staff Engineer Espen Teigen and University College Teacher Michael Andersen Lundsveen.

The Task

The task of this project is to develop an inventory- and loan-system for Østold University College's MakerSpace. The purpose of this is to make it easier for employees at MakerSpace to keep track of inventory at all times. A full inventory-system will help both students and staff to find equipment when a student assistant or department Engineer is not available. The system should preferably be able to know where equipment is in MakerSpace at any time. Simultaneously the employers of this project want to have a system for users of the MakerSpace to be able to loan out the equipment in the MakerSpace.

Purpose

The purpose of this system we are creating is to make maintaining the MakerSpace easier for all parties, but mainly for the University College employees of the MakerSpace. This means that less time is used for maintaining inventory, and helping to find different equipment. It also benefits the school in saving money, as the student assistants don't need to be used as often. They currently help with mundane tasks like finding equipment and counting inventory, and decide what needs to be ordered to fill up stocks.

Project delivery / Prototype

This group aims to supply the employer a website (front-end) and server (back-end) that is both user tested, and to the employers and users specification.

The website will support the following features:

- View all items (Name, Location, Description, Amount in stock)
- Create/Update/Delete items (CRUD)
- Register/Modify/Delete/View users
- User registration either via custom system or via OAuth 2.0
- The ability to loan set items defined by admins (list editable)
- See currently loaned items (all items or based on user)

Additionally to this there will be a REST API based on Node.js and MongoDB to provide a system for storing the information for the website and possible future apps or other systems.

Documentation

Each separate prototype/system will also include full documentation on how the system is to be used and in the case of the REST API, how it can be used in other systems. This documentation will be hosted on the same location as where the code is stored (GitHub). As with our main project page the document will be a web page generated by Jekyll hosted by GitHub Pages.

Method

We will be using the incremental method for development of the system. This method focuses on development piece by piece and works really well for modular systems. It also works for quantitative and qualitative testing of the parts that are done. These parts can also be used, and delivered to the employer.

The method is that you work on one piece of the system at a time. E.g you make the database-system first, and finish it. You can then move on to the next part.

This method has a lower risk of total failure and no delivery, because of the fact that is made up by working pieces.

Project Plan and Milestones

Activity: 1. Pre-project
- End: 18/01
- The responsible: Espen, Nicolai, Thomas
- Delivery: Deliver to tutor.
- Description: Write a pre-report.

Activity: 2. Main report, version 1
- Begin: 18/01
- End: 09/03
- The responsible: Espen, Nicolai, Thomas
- Delivery: Deliver to teacher, tutor and our website as pdf.
- Description: The first version of the final paper.

Activity: 3. Main report, version 2
- Begin: 09/03
- End: 20/04
- The responsible: Espen, Nicolai, Thomas
- Delivery: Deliver to teacher, tutor and our website as pdf.
- Description: The second version of the final paper.

Activity: 4. Main report, final version
- Begin: 20/04
- End: 16/05 12:00
- The responsible: Espen, Nicolai, Thomas
- Delivery: Deliver to the examination office.
  - Printed final version
  - Printed pre-report, reflections
  - DVD or flashdrive with source code etc.
- Description: The final version and our full project.

Activity: 5. Presentation
- Begin: 16/05
- End: 31/05, 01/06, 02/06
- The responsible: Espen, Nicolai, Thomas
- Delivery: Presentation.
- Description: A presentation about our project. 20 + 5 min

Implementation

Roles

There are no specific roles in our project. The group members have different specialties, and will work within these.

Version Control

The group has decided to use GitHub for version control. This will be used for our code, and our reports. Since GitHub is widely used and well supported, we are confident that it is the best fit for us.

We will use different repositories for our project, of which most will be public. Since this is a Makerspace project, we want to make everything open-source and public.

Risk Management

Nr	Risk/Event	Probability (1 high - 5 low)	Serverity (1 high - 5 low)	Consequence	Action
1	GitHub is down and we can't work with our repository	4	3	The group will not be able to use GitHub to do collaborative work on the project. This might severely hurt the speed on the development of the system.	Go over to the backup on OneDrive. Communication must be used to make sure no one is working on the same code at the same time for version conflics
2	Member or members become sick and can't work on the project for a extended time	2	2	The rest of the group get more work that needs to be done. Might also cause heavy strain on the group.	The group has to find an effective way to share the tasks the sick group member would do. In the case of a long absence of a group member, the group should talk with the employer about changing the requirements for the project
3	The project change course and the project has to be totally reworked.	4	1	All the work up to the point has to be scraped.	Make sure that the new course is possible to do with the aloted time left.
4	Members of group die	5	1	Loss of work and information on the code that member produced, and was not documented might get lost.	Arrange a meeting with the employer to discuss how the project needs to change to be able to deliver it with a smaller group.

Table 1: Risk management table