Large Object Detection Next to Waste Containers using IoT

Process report

Eimantas Sipalis 254018

Romans Kotikovs 252550

Supervised by Ib Havn

VIA University College

Software Technology Engineering

7th Semester

February 2020

Introduction

The purpose of this document is to describe a team's internal processes during this project. This document covers the group members and how the project was choses. Project execution describes used methodologies and tools. How kanban was adapted into the team. Personal reflections from each of the members about the process. Quick review of the supervision.

Group initiation

The group consists of two members. Group members know each other well and have previous experience working together within smaller and bigger projects before. Both members specialize in embedded systems. That led to a balanced working environment.

Project initiation

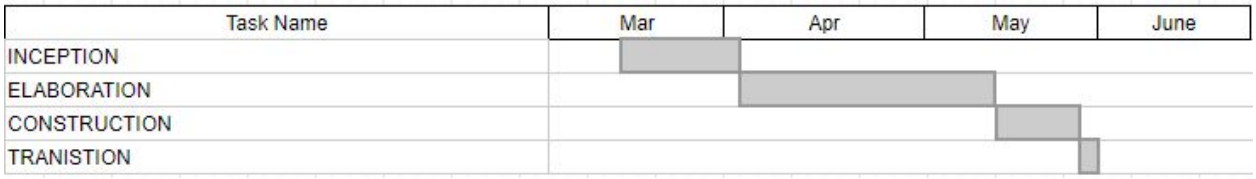
During the 6th-semester bachelor preparation course local communities and businesses presented their problems that required software engineering solutions. One of the presenters was Runik Solutions, a company that helps Horsens kommune with waste management. They clearly stated that their problem required embedded system knowledge and our group was looking for this kind of challenge. Runik Solutions was looking for a possible way of detecting large objects when people place household furniture and kitchen equipment on the platforms of the underground waste bins. For us, as a group, this project seemed interesting. Real-life case, working with the stakeholder and customer and their requirements.

Project execution

Methodologies

The project followed the Unified Process[1] and Kanban agile frameworks. The Unified Process framework was chosen due to clear phase separation that the project underwent. It allowed us to work iteratively and helped to keep track on which phase of project lifetime stands in contrast to the deadline. Following UP guidelines it was clear what should be done now and what should be done next. It assures that nothing is forgotten, e.g. some software artefacts.

Kanban[2] was preferred , because of the team size of 2 people. Scrum wouldn't make much sense in such a small team size. The whole team was responsible for maintaining the product backlog. The team had weekly meetings with the group's supervisor. Since this was a prototype project, the minimum viable product was established in the beginning without "nice to have" features. There was no estimated timeline. The group progressed through backlog one user story at a time.



Tools

Here are described main tools that were used during the work of this project to increase the productivity and transparency inside the team.

Git

Git[3] is a free and open-source version-control system. It let's keep track of changes in the source code during software development to ensure safe parallel workflows.

[1] https://en.wikipedia.org/wiki/Unified_Process
[2] https://www.atlassian.com/agile/kanban
[3] https://git-scm.com/

Trello

Trello[4] is a digital Kanban board for project management. It helped visualize the progress of the project.

Personal reflections

Romans

I enjoyed the kanban framework even though I am a big scrum fan. This project made me realize that scum would be an “overkill” for this team size. I think it made it more agile in the sense that we trimed the unnecessary meetings and found more time for work on the project.

Eimantas

I liked that there was no need for mandatory scrum meetings. We could choose our own framework of choice. It helped to focus more on the ongoing tasks and communicate only when there was a need for it since we are in a small group.

Supervision

The group has previously worked with supervisor Ib Havn but not to such extent. It was a great pleasure to work with him despite the Covid-19 crisis. It was fairly easy to switch to internet based meetings.

Ib’s role as a supervisor was to guide us through project processes. We received great guidance throughout the project especially during inception and elaboration phases[5] which established a solid foundation. We could freely address Ib when we were uncertain, mostly in specifics and technicalities of documentation and UML[6].

[4] https://en.wikipedia.org/wiki/Trello
[5] https://en.wikipedia.org/wiki/Unified_Process
[6] http://uml.org/what-is-uml.htm

During the first meeting it was established that we would hold weekly supervisor meetings on Thursdays unless we have decided differently. Day before the meeting we would send the latest version of our project report and if we have some other inquiries regarding the upcoming meeting. Some weeks we were not able to meet due to the public holiday.

We believe that Ib was well qualified for this project as a supervisor as he brings strong hardware programming and software architecture proficiencies as well as great communication skills. We really enjoyed working with him.

Supervisor meetings

Week number	**Topic**
11	Overview of project idea
12	Review of requirements
13	Review of use stories and use case diagram
14	Review of hardware analysis and LoRa module configuration
16	Review of software analysis
17	Overall system design
18	Detection system node design
22	Hardware drivers and Application server database
23	Testing

Conclusion

In conclusion we believe that project was successful from a project process perspective. The plan that was laid out was clear. We worked on the most meaningful parts

first to ensure customer and supervisor can see the progress and road map of the project. Usage of Kanban was successful. If we estimated items more carefully maybe we would be able to improve delivery times. Supervision and partnership was outstanding. Regular supervisor meetings made the project more streamlined.