VentuSolaris

Proces Report

Introduction

This report gives a closer look on the process that we went through while building the SSV. The problems we encountered and the things we had to change during the weeks we worked on this project. It also compares the plans we made at the beginning of the project and how we changed these. The cooperation of the team will also be discussed in this report, as well as the skills each team member had at the beginning of this project. We will proceed to the skills we acquired and the skills we missed and which got us into trouble. At the end we will draw our conclusion about the final outcome of this project.

Planning

In comparison with the Gantt chart we turned in at the beginning of the project we changed a lot. Other people became responsible for parts of the project and other people worked on parts of the project than they were signed up for. But is definitely not a bad thing because during the project people discovered skills and worked on those skills by working on a specific part of the SSV with someone else, while they were not responsible for this task or signed up for this task. In the end everyone worked on every task instead of on only a few tasks. In this way everyone knew everything about the SSV and the people responsible for a task had very few things to explain to the other members of the team. The duration of the tasks was quite accurate with the duration on the Gantt chart. We often forgot to update the Gantt chart but in the end all the tasks got finished in time and our SSV drives smoothly.

The major problem we had was nobody keeping an eye on the schedule for the project. Resulting in the team having to work very hard to reach the deadlines because we simply didn't know the deadline was already there. But this resulted in a good cooperation between the team members to get the job done in time. We planned emergency meetings to work hard on the reports and the cases to get them finished in time.

Cooperation

All team members really worked together on this project. There was no one doing nothing at any moment. Everyone had his task at any given moment. Some people have spent more time on drawing than other or on building but this was planned this way at the start of the project. Every team member also had his part in the reports.

There weren't any real problems concerning the cooperation between the team members. No tasks were done twice and everyone had an equal share in bringing the project to a successful end. The only problem in our team was no one being a genius in the simulations. So this required a fair share of cooperation to bring everyone's knowledge together and bring that part to a good end. Because we had only one member being able to weld steel, he was the one working the hardest on the physical aspect of the SSV. Because of him the frame of the SSV was solid and strong enough to take the collisions with the ball. He spend a great deal of his time on building the SSV so there was no real

cooperation there but the other team members helped with this in every possible way. For example drawing the pieces to connect the motor, the gears and the part with our logo. We helped as much as was possible for non-welders.

Skills

The skills that were present at the beginning of the project were the following: Every team member had a good knowledge of the course material we needed for this project, like for example materials, differentials, dynamics and so on. We were lucky to have a team member with the skill to weld steal and a team member being able to make really good and accurate drawings in solid works. The skill to cooperate with other engineers and to accept remarks on their work was also present. And of course we had the skill to work hard.

The team missed the skill to keep an eye on the deadlines resulting in having to works really hard to get the work finished in time. And of course we lacked the skill of simulating calculations in the completely unknown programs Matlab and Simulink. But this is to be expected since we had no courses on this subject. These programs were completely new to all team members.

Also the movies on Simulink that were available on Toledo were a little bit confusing. At first we just did the same as was told on the movies and we thought that was it. But it turned out that was an example from last year. The result is that we completely underestimated the Simulink part. This and the fact that we didn't know Simulink also had to be finished in week 6 made that we were late for the deadline.

We learned to work with these programs and because of this we were able to simulate the required things and make some important decisions on what to use as gear ratio and mass. Towards the end of the project we started to master the skill of finishing assignments in time without having to call in emergency meetings and work hard.

Individual experience

Nick:

During this project I learned how to handle big problems by making assumptions. I quickly noticed how important it is to make good assumptions. In our project we sometimes made some wrong assumptions what resulted in a wrong report. What I liked about the project is that the things we have learned last semester or last year finally came to use. Like for instance the strength calculations on the SSV.

Frederik:

At the start of the SSV project we had to think about skills we hadn't developed or practiced yet. For me, those skills were mostly related to planning and a helicopter view over the progress and the deadlines that were due. At the start of the project I really tried working on that by keeping up with the schedule and regularly checking Toledo and the manual. This faded during the weeks though. When I started working on individual tasks, I forgot the whole and wasn't checking the deadlines and tasks anymore. I was covered, though, by Steven, who did the further coordination of the project. I

learned a lot about mechanics and, although the Matlab and Simulink parts weren't a succes for me, I still want to study mechanics further and I am happy with the result.

What I disliked about this project was the time and effort you put in a certain problem because you don't know really how to handle that problem. And then you get the feedback from the coach and it turns out that you have to start over. So the last 2, 3 weeks were actually a waste of time. And then the coach starts explaining you how to handle the problem. I don't really know why the coach doesn't explain this at the start of that problem. But I guess that's part of learning.

Jeroen

At the start of the project my main focus was to improve my skills with computer programs like matlab but also maple or even the editing of a wiki page. As I look back on the project I am confident that I succeeded in this goal, I learned how to work with matlab and simulink as well as the wiki page editing. I was also able to improve some skills I already had, like drawing in solid works (I am pretty sure I am a pro at it by now) or planning of certain tasks.

What I also found very useful during the project were the skills we acquired by writing the report and getting feedback. Mainly the iterative method of calculating a value or working back from a certain value seem very usable in future projects. Learning to work with simulation programs like matlab and Simulink will also come in useful in the future.

There were a few things which could be improved about the project in my opinion. The most important thing being how to work in Matlab, it was very frustrating to start with absolutely no knowledge about how to work with Matlab and it would have been helpful if we had a seminar about Matlab or even a small introduction to it. It's also a bit frustrating to have to rewrite or recalculate certain parts of your report because you didn't do them the right way. It would be helpful if we got some explanation beforehand about certain parts like working back from a certain value.

Steven

I was the team leader during this project. It wasn't as easy as during EE3, where I also was the team leader. The was amazing though. Everybody worked hard and I never had to ask people to work harder. The only problem of the team in my view was keeping an eye on the deadlines. For some reason we only were able to remember one deadline when there were two deadlines.

The thing that frustrated me the most was the fact that the Matlab code and Simulink models never started working until the end. I think it was very hard for us to start working with these programs without any introduction or seminar on this topic. But eventually we learned to work with these programs.

Another frustrating part is the fact that we don't get any guidelines or help from the coaches. Resulting in having to rewrite an entire report after turning it in because we used the wrong assumption or the wrong way of thinking. I understand they aren't there to make the project for us. But maybe they could help us when we are making the mistake and not when we already have made the mistake and then have to explain every step we should follow.

I learned a lot of new skills during this project, like for example iterating when doing analytic calculations. I had never done that before. Also being team leader for this kind of project where you

have to calculate and simulate a lot resulting in major setbacks wasn't easy and I had to adapt. And I learned to use many things we learned this year or last year.

Simon

During this project for EE4 I learned a lot of new things. First of all iteration, it's a new way of calculating which I had never used before, but while I started getting a hang of it I actually enjoyed this technique. It's pretty straight forward and you get the wanted result pretty easy and fast! Second thing I learned was that we don't always need all the correct info when we are thinking and making calculations. For some parts it's not necessary to have all the variables because by thoroughly thinking trough the problem we can make pretty good assumptions for the parts that are unknown to us. This learned me think completely different about some questions or tasks we had to do and calculate.

Some stuff I didn't like about the project was the lack of help we got. We only saw the coach once a week (not every week) and those sessions were very brief. This resulted in a lot of wasted time in my opinion because we had to start over and over and over again quite often. Just because we made a mistake in our way of thinking or calculations but because we only saw the coach so briefly those were the only moments he gave feedback and told us what was wrong. Sometimes when they even explained it to us how we were supposed to do it they told it in a very vague manner which didn't actually help at all. What also would have helped was if there were seminars about certain parts of the course, such as matlab and Simulink.

But still I really liked this course, it was fun and I had a great time working on it with my teammates. My welding skills also came in handy and they only improved drastically over the time working on our SSV.

Martijn

At the start of this project, I wrote down the skills I lacked. These skills were sticking to the planning and working in a structured way. I still noticed during the project that I need to improve these skills and I think I did. I had a lot of motivation in the beginning of the project, but there were some moments when we felt like we were stuck. There were some weeks were we did very little work because everybody's motivation was low. But when things fell together, there was a lot of relief and excitement. Then we would be ready to move on to the next task.

During this project we had to make a lot of assumptions. I learned that you sometimes have to make assumptions to be able to solve a specific problem. It's very important that these assumptions are reasonable. We made some bad assumptions and as a result we had to redo some tasks. It wasn't fun at that time, but looking back at it, we had a great learning curve. The coach made us understand what we did wrong and gave us new insight on how to solve it the right way.

It was not an easy project, but it was a useful project. Especially because we could finally use the theory for a practical application. Our team functioned well and I'm happy with the things we have achieved together.

Conclusion

We think we did well on this project. Our SSV works fine and all the required cases are almost finished. The process we went through to get to this point wasn't easy. We had some difficult moments where the motivation was low. Mainly because of the simulation and Matlab errors. But once we started building and the SSV was doing well our motivation went up and we all started to look more positively towards the project and we wanted to bring it to a good end.

Our goal was never to get the most beautiful SSV and it most certainly isn't. But we were going for the most innovative SSV and we want to win the race. Our SSV is definitely innovative in the way it is build. We haven't seen other SSV's yet with the same triangle shape and being constructed out of steel. But we don't think it will win the price of the most innovative SSV. We were planning on using a steering mechanism and maybe using 4-wheel drive but we came to the conclusion and we got the advice from our coach this wouldn't be the best idea. We ended up using wheels on the side to keep the SSV straight on the track which never was our intention at the beginning. We are still hoping to win the race but we will have to wait on that result.

Next time we should definitely try to keep an eye on the schedule so there won't be as many unwanted surprises as we had during this project. Maybe we should put more effort in the making and following of our Gantt chart but in the end everyone did as much as any other team member. And we should definitely work on our report from the start, so we would have to do less in the end.