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Design a SSV

SMALL SOLAR VEHICLE

Process report

- Individual experiences

Stijn Van Damme

During this project cooperation was an important factor. It was necessary that everyone knew what was already done and what still needed to be done. Only with this strategy it was possible to ensure that no business would be done twice. Sadly the communication between the team members was very low. We came together in meetings and nothing was arranged clearly. Because of the lack of communication not all team members were present at all the meetings. There were some meetings with only two persons and meetings that were arranged two hours before they took place.

At one moment there was not really a team. There were some groups formed inside the team that communicated with their group but not with the rest of the team. Because of that all the team members never had a good view about what was already done and what would still needed to be done. Due to these lacks it was a very difficult project to work on as a team.

Despite these problems the deadlines and the solar car were always reached in time. Furthermore I want to thank our team leader because he really put a lot of effort in this project. I blame myself that we didn't help him with finding a solution to the communication problem. In that way he wouldn't need to have worked so many times alone on the project.

Communication between a team makes a project work but could also let it fail completely. That is the most important thing everybody of the team should have learned from this project. Secondly, a good atmosphere in a team makes working on a project a lot easier. I think we can't blame one person for this communication problem because we were a team and we should have checked and evaluated that better so that an alternative could be found.

Good:

A thing I really liked about our team was the teamspirit. Despite the communication problem there were no quarrels and there was a positive atmosphere. When we started the project we agreed that the communication should go via Facebook. The problem was that not all our team members had Facebook. So an alternative was found to send that person a mail so he was also updated with the progress. Because every member of our group has a different set of skills, it was great to develop our solar vehicle.

During the project I first met with fablab. A good presentation was given to inform us about what should be expected and what you could do in fablab. When we finally arrived there I knew directly what the function of the machines was.

Downsides:

Although most of the explanation for this project was sufficient. For some calculations the explanation was insufficient. Furthermore the difficulty of the first test was quite high and it was not very clear what could be asked on the test. For next year I would communicate more about the test and what could be asked etc.

Thomas Dewit

During previous projects all team members proved to be capable to adapt to new groups to work in. This is already an important social skill. In these previous projects a lot of new software-programs were used which needed to be mastered to accomplish decent results for the projects. All our team members are capable of processing the new theory to work with these programs. The theory treated in the lectures is also used in the projects. Most team members were up to date with the theory and were able to use this knowledge in their advantage for calculations and reports.

A skill that has improved in this project was the ability to estimate the time needed to finish certain aspects of the project. The ability to split the needed work in equal parts between members also improved. These two abilities combined resulted in the quickly finishing of reports, building the vehicle, calculating, ...

A skill that was most definitely missed was the communication between team members. Despite the countless means of communication, the organisers in the group failed to notify the others of meetings and of work meetings. On the other hand, the persons in the group that were not up to date with the meetings and other stuff failed to communicate with the organisers to try to inform about the meetings. Eventually this lack of skill hasn't prevented the building of the vehicle or the finishing of reports, but it has influenced the quality in which this has happened. The vehicle could've been better as a consequence of better working together. Also, some team members have spent more time trying to build a good vehicle than others.

Another skill some team members had problems with was the skill to estimate if other team members needed help or not. Since everyone kinda had their own part of the reports and the calculations, some team members had more difficulty completing these parts than others. This is natural but some members put more time in it. The help of others could have influenced this needed time.

Sarah van der Want

From the beginning everyone was very enthusiastic about this project. Building your own solar vehicle sounds pretty excited. But the reality was different. At first it all wasn't quite clear what had to be done so it took a few weeks until we started to achieve something. Also the lack of communication caused a slow start. When the first deadline approached, communication got a little bit better because of the pressure. Because of this pressure we did work well together and managed to deliver a good report. After this, everything got silent again. We decided to work separately on the design of our SSV but this didn't got us very far. When eastern holiday was over, the test day approached quickly and we didn't even had a car. This gave us the stress and urge do build a car as fast as possible. Because of our lack of communication and working together, I think we didn't build a car that was the best we could do.

When this project is over, I think we can all acknowledge that a team assignment lies in communication. Although we did manage to achieve all our deadlines, we could have done it way better. I think it is also important to know what everyone's strengths and abilities are. This last thing is what I missed the most. Nobody really took the initiative when needed. We didn't have that one person who dragged some of the team members into making all the calculations or into building our SSV.

Another downside was the little information we got to develop our car and finish some of the reports. A lot of formulas, values, test results, calculations weren't that clear or explained as they should have been. It is hard to rely on other students and Google with an assignment rather than receiving information with a seminar.

Thijs Kestens

Like every team project the level of enthusiasm starts very high, has a downwards curve somewhere in the middle of the project and rises again when the deadline is closing in. I think this curve was also applicable on our team: Esté. We started very good with the case SSV part 1, everybody was motivated and there were a lot of good ideas about our solar vehicle. When it came to building the car and making concrete plans and personal deadlines, I think we failed in working as a team. There was an inequality in motivation and initiative that led to inefficient work hours with rather vague arrangements and communication problems. As the deadline approached and the SSV had actually to be made, I think only a few members of the team were really up to date with the vehicle's progression and were aware of the actual work that needed to be done. So the building process was completed by individuals and not by a team due to a lack of initiative and communication on all the sides. We managed to make a working small solar vehicle though and I think that in the final phase everybody had a good part in finishing Case SSV part 2.

Personally I learned a lot in this project. I am not the strongest intellectual force when it comes to technique but I think I managed to be up to date with all the calculations and was quite eager to be part of the actual building process. During the project I picked up how to work pretty good with Solid Works and Inkscape and I also picked up some new experience with using the machines in Fablab. In terms of working in a team I think I learned that communication is the hardest part and I will work on this problem by trying to make decent arrangements with all the team members when starting new projects.

Tim Theunissen

From the beginning of the project I was very enthusiastic. Building a small solar vehicle was a real challenge for me. When I knew the other team members I was sure that we would create a great working solar vehicle. But as Thijs said the curve of enthusiasm is totally adjustable on our team. The first assignments and arrangements went very quick and efficient. We were on our way to make something great of it. This fact was confirmed when we got a very positive feedback on our cas SSV part 1. But when the moment came to really build the vehicle some things went wrong. The communication between the team members

was insufficient. I don't blame anyone of the team for this because I also made mistakes in this. But it sometimes looked that some team members thought the vehicle would construct itself.

Appointments were not clear enough. When we came together, most of the time we just divided the tasks and that was it, no concrete things. For this reason the reserved time on tuesday wasn't always that sufficient. Things went slowly according the building of the vehicle. For this reason I said to myself that I would finish it. I really wanted to make a working vehicle which could pass the race on a proper way. Otherwise it would embarrass me if we would have a car which doesn't even reaches the finish line. So I spend a lot of time in constructing the solar vehicle. I spend several hours in Fablab to construct the right body for our vehicle. This is where I learned to work with the vector based drawing program Inkscape. Another great problem was the steering mechanism. It was based on the steering servo of my old Nikko Rc car. It took me some time to really make it work in an appropriate way. When this part was finished the electrical wires needed to be connected. On this way I learned to solder. When all parts were adjusted the small solar vehicle could be tested. This was definitely the highest point in my enthusiasm-curve. A working solar vehicle steering with a remote control mechanism!

I haven't done everything on my own, that's impossible. For this reason I'd like to thank my other team members for their work. I'd also have made some mistakes by communicating insufficient to the other team members on the things I was doing. But on one moment I admit that I was frustrated by the fact that there was little initiative from some team members. This was the moment that I decided to take initiative to finish the vehicle. And here I made some mistakes by not communicating to the other team members on the work I had done. Maybe because of the fact that I was stubborn. So I'd like to apologise me for the faults I have made between the project.

On the other hand the project was very learnfull for this reason. Everything went well and the team definitely had enough skills to accomplish the task. But because the lack of decent communication the solar vehicle isn't that good as it could have been. A thing which can be worked on in the future.

In the end i'm still proud on the vehicle we created. It is a very fun project and it gave me a lot of insight in some technical problems conforming engine, gears and electronics which is very helpful for the rest of my studies.

Thomas Craessaerts

When we got the assignment I was quite excited for this project. Building a solar vehicle seemed like an interesting project so the motivation was pretty high. When we were working for the first case everything went well and I looked forward to the realization of our real car. While making our first report we didn't encounter much problems and everything went as expected within the deadlines. We learned how to use matlab, simulink, how to

calculate gear ratios, ... This first case went well and our coach was pleased with our report. At this moment the motivation for our car still went upwards.

During the creation of the ssv I think me and the team lacked some communication skills. For example I didn't inform Thijs about the sketches for fablab, which caused some double work. In future projects this should be avoided. I really need to work on this. We lost a lot of efficiency and time due to things like this, time that could have been spend on other aspects of our project. This will be a point of attention for me in future projects. We need to establish clear tasks and communicate more. Otherwise nobody really knows what's going on and this can create tension in the group.

Eventually we got a working car after some fablab visits. During this project I also learned it's not that easy to express ideas you have to other people. For example everybody had his own idea about our steering system, this caused some discussions. Sometimes it's better to do and try than to keep on discussing. The building part of our project lacked some organizing in my opinion. We beat around the bush too much.

- **Adjusted Gantt-chart**

The new and improved Gantt-chart for our project can be found in the attachments.