

Process report



Introduction

This report gives a brief overview of how we were able to realize our solar car project. The report contains description of the various processes that led to the realization of our final goal, how we have worked together as a team and the problems we encountered during the course of this project.

Jet solar team is made up of eight students from different parts of the globe. The nationalities represented in the group are Belgium, Cambodia, Nigeria and Thailand. Each of these countries has different culture and norms which are incorporated in the group.

There is a good understanding among the team members everyone in the team is given the opportunity to make contributions or suggestion. Everyone's idea is welcome, although we have a leader but no one is superior more than other team members.

The team has a unique way of approaching problem which is as a result of difference in ethnicity and culture. This cultural diversity gave the group a sense of completeness and more comparative advantage over other team.

Cultural difference in the team has positive impact on the team's discussion making process when we are confronted with problems that needs urgent solution.

Planning

Generally, we were able to finish our solar car according to plan. Some of the tasks were more time demanding than what we wrote in our Gantt chart initially. There are some smaller tasks which were not included in the Gantt chart because we did not plan for them for example the drilling of holes through the car frames to reduce the total weight of the car and the continuous update of our process report.

We had some problems when testing the car we discovered that it cannot start except it is given an initial push and it could not run pass the ramp. When we thought about the problem, we discovered that due to there was no bearing connected to the wheels, the frictional force between the wheels and the ground prevented the car from moving. We bought some bearings and fixed it on the wheels, that was the solution of the problem.

One of our biggest problems was simulation. What we simulated was different from what happened in reality. The car functioned better than we expected.

We are open to criticism and correction from other teams thus our final result becomes much better.

Organisation

The group is organized in such a way that everybody is useful and busy with some tasks. We have a leader whose responsibility is to assign tasks to each member of the team he also ensures that each team member is working hard enough in order to meet deadlines.

We have a good and transparent leadership; the leader takes everyone along and listens to the team. We have a secretary whose responsibility is to take note of all ideas and point during meetings. The secretary prepares the meeting report of the previous meeting and comes with it to the next meeting.

At the beginning of the project, one of the most difficult problems in team work was communication because we have eight members coming from four different countries in total. Fortunately we made a great agreement on this problem and solved it quickly by clear plans and regular meetings. As a result, everyone knew what he or she was expected and tried his/her best to make contribution to the group. We managed to another manner of working to improve work efficiency. It means dividing the team into 3 to 4 small groups, instead of working individually or in a big eight-person team. Besides, we use Dropbox to exchange files online which is really convenient.

As for the contact with the coach, we meet with Mr. Tan Ye almost every week and get advices from him. When facing problems we will first try to find the solution by ourselves and if we are stuck with something we will turn to our coach. He guides us which part we should focus at and reminded us all the deadlines. Of course he gave us advice about our working, such as the calculations we finished.

Skills & Problems

This project was successful because of the skills and contribution of each team member of our team. Throughout this project one skill has been present in the team, which is the ability to work together in one spirit. This has helped us tremendously in this project because we never had any misunderstanding among our self.

EE4 project have helped us develop our individual skills like ability to be a leader, ability to organize project, how to understanding and have patients with people from different cultural background as you. It also expanded our knowledge about the applications of knowledge we acquire from divers disciplines such as mechanics, electricity, material technology, technical drawing and some software. At first we really did not know what we should do and how to start. A lot of formulas about mechanical calculation and a complex software Mat-lab made us confused. We assumed some parameters only by guessing, such as the mass of the vehicle, the diameter of wheels and the gear ratio.

There were no skills that caused problems for the team we only encounter challenges in some of our calculations which we rectified with our coach Tan Ye, these mistakes actually improved our knowledge at the end. There are some skills which were also lacking in the team, we had no one who knows how to use simulink that was one of our biggest challenge.

Cooperation

Every member of the team has been allocated several tasks to do with a given deadline. The tasks are distributed as we progress in the project.

Tasks are done using the principle of division of labor, the entire team is divided into groups of two or three students each with a specific task and a deadline. Each group can also split into subgroups where individuals are given their personal task and also with deadlines. The task done by an individual and the amount of time spent on that task is recorded in our work breakdown structure (WBS). Each individual has a log book where he or she writes down the amount of time he spends working on a particular task. This enables us to know how much time is used to complete a task and how much work is done by each team member, we can also avoid the situation in which some one or two people in the team are working more than the others.

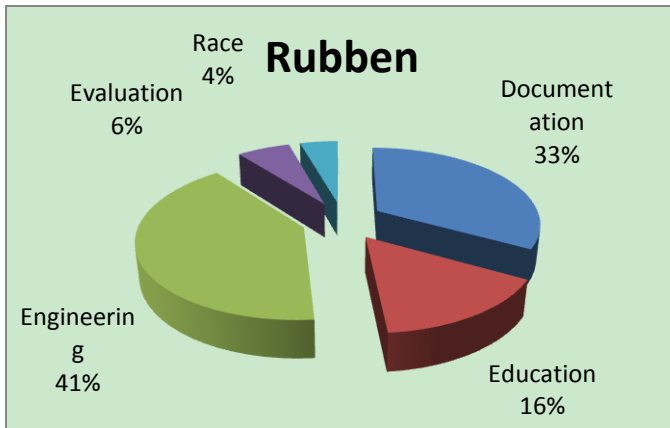
Tasks are distributed equally among all team members, if a group is having some difficulties they can ask for assistance from other groups or can demand for an extra person to join them to make their job much easier.

The tasks were distributed as follows: Ruben and Liu did the draft of Sankey diagram of Umicar, Joe and Jeroen did the marketing part (4P), Qi and Sokna did measuring the car length and Thomas, Hans and Jeroen built our car. We tried hard for each task and we communicated through mail during Easter holiday. , Ruben, Thomas and Qi went to Fablab in order to cut and remove some part of our car to make it lighter because our car was quite heavy.

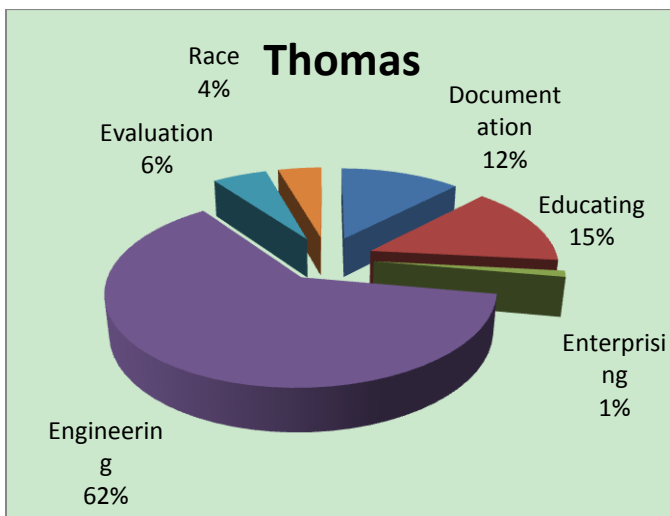
The contribution and task assigned to each member of the team and the number of hours spent on each task is given in the table below. The graph also shows in percentage the aspect of the project that an individual spent more time in during the project.

The tasks are divided into six major groups and each group is subdivided into subgroups as follows

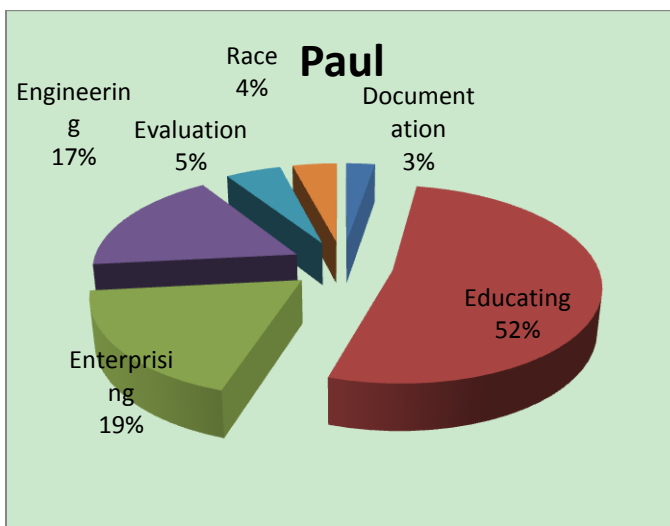
Group	Subgroup
Documentation	POA, Gantt Chart, wiki, WBS, Contract, Administration, meeting
Enterprising	Marketing, Logo & Name, Website, Budget Control
Educating	Research, Seminars, Process report, solution Report
Engineering	Design, Calculation, Sankey diagram, Prediction, building, Transmission ratio
Evaluation	Peer Assessment



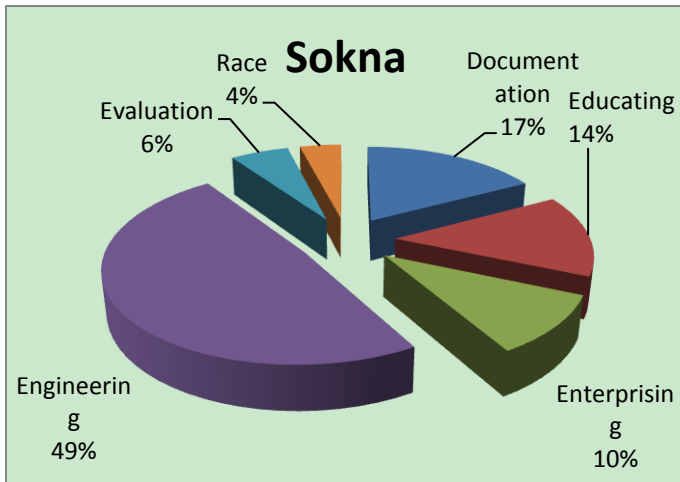
Task	Hours
Documentation	15
Education	7
Engineering	18,5
Evaluation	2,8
Race	2



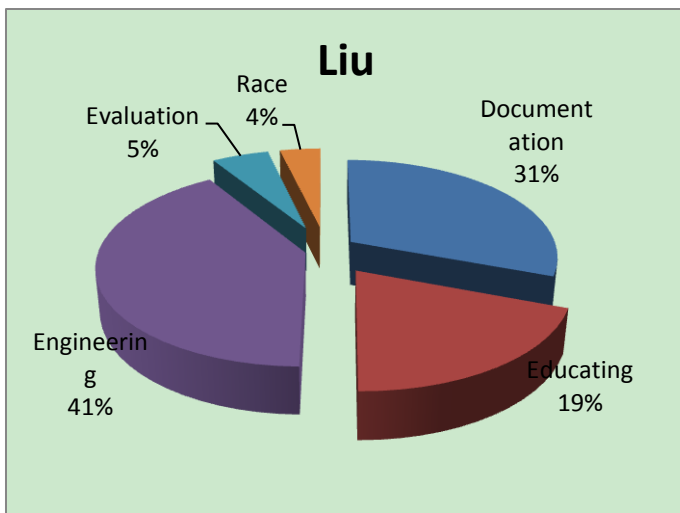
Tasks	Hours
Documentation	5,5
Educating	6,5
Enterprising	0,5
Engineering	28
Evaluation	2,5
Race	2



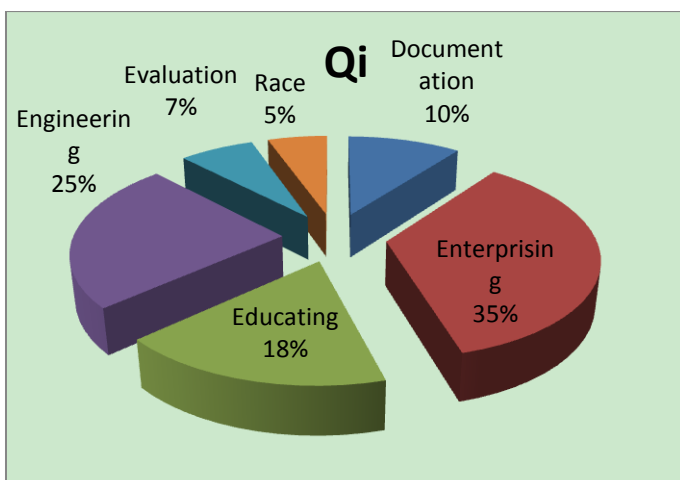
Tasks	Hours
Documentation	1,3
Educating	25,5
Enterprising	9
Engineering	8
Evaluation	2,5
Race	2



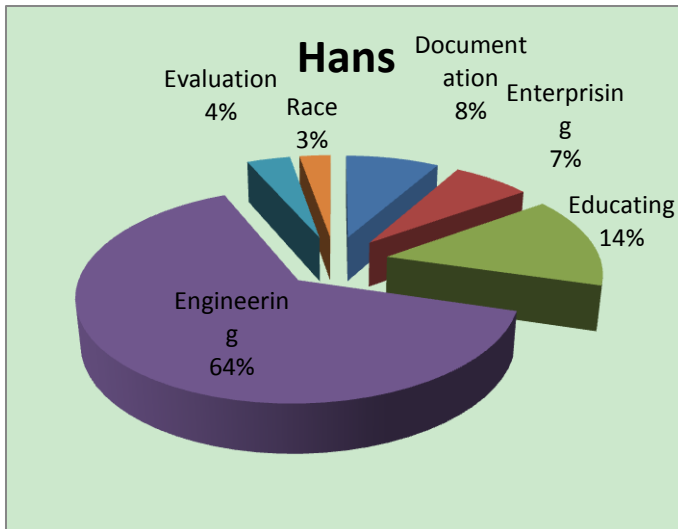
Tasks	Hours
Documentation	8,5
Educating	7
Enterprising	5
Engineering	24
Evaluation	2,8
Race	2



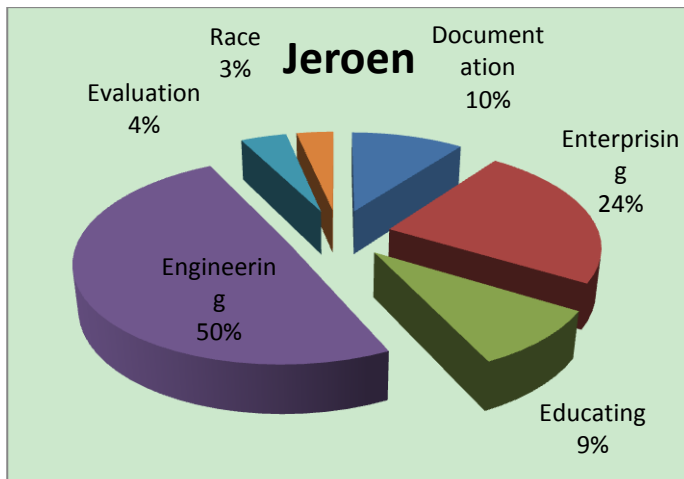
Tasks	Hours
Documentation	16,5
Educating	10,5
Engineering	22
Evaluation	2,8
Race	2



Tasks	Hours
Documentation	3,8
Enterprising	13
Educating	6,5
Engineering	9
Evaluation	2,5
Race	2



Tasks	Hours
Documentation	6
Enterprising	5
Educating	10,5
Engineering	46,5
Evaluation	2,8
Race	2



Tasks	Hours
Documentation	6,1
Enterprising	14
Educating	5,5
Engineering	29,5
Evaluation	2,5
Race	2

Conclusion

At first we thought we will encounter problems building and designing the car but we rather had problems with our simulation with simulink. We found that our car function much well than we simulated.

The most interesting experience for us is to work in a mixed-culture team. We have Nigerian, Belgian, Cambodian and Chinese persons. While working together we sometimes experience some culture gaps, which is not surprising. For example de Belgian persons can speak Dutch to each other while the rest does not understand it and so for the Chinese.

We deal with this problem as we repeat our conclusion, it saves time and at the same time we can make everyone clear. When working as a team, we noticed that it is quite quick to deal with problems together. Since we have different view angles, we can solve the problem eventually even it looks so unachievable at first.

If this team should embark on this kind of project in future, we will improve our organization and assign a lot of people the task that deal with simulation because we believed that the reasons why we had problem with our simulation was because only two people was working on this aspect of the project.

Literature

We got a lot of information from documents posted on Toledo and through researches we made on the internet and the series of seminars which we had also helped us tremendously.