



University of Wales Trinity Saint David
Wales Institute of Science and Art

Engineering Management
ACHA 5012

Jake Davies
2205290
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Introduction

The aim of this project is to fully plan the group project to give us structure for executing the tasks that we have been assigned, this will include a self-assessment referencing to Belbin's model. Overall group tasks with much more focus on personal tasks and roles within the project, further including gateway objectives and milestones to help us track progress. There will also be a risk assessment to show what possibilities there are of not being able to complete my role in the project and a structured plan of how to prevent these risks from happening.

The aim of this group project is to choose a part of the NSF250 Honda that we find particularly interesting and produce a new design for the part of your choice, then we will make the part using a 3D printer to check if the part will fit onto the bike and if this is successful we will then run some tests such as CFD modelling to evaluate the item, we will then make further adjustments where necessary to achieve the biggest improvement. This will then lead to producing a final product made from the desired material such as carbon fibre and have the new parts tested on the bike when we take to the track. This project also entails working together as a team and communicating well to achieve common goals. This project will also teach about fulfilling our own individual goals for the whole team to progress further with developments.

Team Members Roles

Name	Task	Start Date	End Date	Duation
Olly	Install and Test ECU	30/09/2024	31/10/2024	31
Olly	Optimise Fueling maps and strategies	31/10/2024	30/11/2024	30
Olly	Bellmouth/Secondary Injectors	30/09/2024	31/01/2025	123
Olly	Design and Prototypes	15/10/2024	15/01/2024	92
Olly	CFD Bellmouth Designs	15/01/2024	14/02/2025	30
Olly	Production	14/02/2024	14/03/2025	28
Olly	Dyno Runs	01/01/2024	28/02/2025	58
Oska	Initial Measurements	30/09/2024	15/10/2024	15
Oska	First Design and Prototype	15/10/2024	15/11/2024	31
Oska	Desgin Refinement	15/10/2024	15/01/2025	92
Oska	Final Testing	15/01/2024	14/02/2025	30
Oska	Production	14/02/2024	14/03/2025	28
Harry	Initial Measurements	30/09/2024	15/10/2024	15
Harry	First Design and Prototype	15/10/2024	15/11/2024	31
Harry	Design Refinement	15/10/2024	15/01/2025	92
Harry	Final Testing	15/01/2025	14/02/2025	30
Harry	Production	14/02/2025	14/03/2025	28
Jake	Initial Measurements	30/09/2024	15/10/2024	15
Jake	First Design and Prototype	15/10/2024	15/11/2024	31
Jake	Design Refinement	15/10/2024	15/01/2025	92
Jake	Final Testing	15/01/2025	14/02/2025	30
Jake	Production	14/02/2025	14/03/2025	28
Harvey	Initial Measurements	30/09/2024	15/10/2024	15
Harvey	3D Scans	30/09/2024	31/12/2024	92
Harvey	First Design and Prototype	15/10/2024	15/11/2024	31
Harvey	Design Refinement	15/10/2024	15/01/2025	92
Harvey	Final Testing	15/01/2025	14/02/2025	30
Harvey	Production	14/02/2025	14/03/2025	28
Megan	Research Alternative Fuels	30/09/2024	31/01/2025	123
Megan	Research Secondary Injector	30/09/2024	31/01/2025	123
Megan	Check Championship Regulations	30/09/2024	15/10/2024	15
Megan	Dyno Runs	01/01/2025	28/02/2025	58
Ed	Retrieve CAD Drawings	30/09/2024	15/10/2024	15
Ed	Update Designs	15/10/2024	15/11/2024	31
Ed	Prototyping	15/10/2024	15/01/2025	92
Ed	Design Refinement	15/10/2024	15/01/2025	92
Ed	Final Testing	15/01/2025	14/02/2025	30
Ed	Production	14/02/2025	14/03/2025	28
Aaron	Initial Measurements	30/09/2024	15/10/2024	15
Aaron	First Design and Prototype	15/10/2024	15/11/2024	31
Aaron	Design Refinement	15/10/2024	15/01/2025	92
Aaron	Final Testing	15/01/2025	14/02/2025	30
Aaron	Production	14/02/2025	14/03/2025	28

Identify Skills and Personality traits

Belbin's Category's	Implementer	Shaper	Completer/ Finisher	Plant	Monitor/ Evaluator	Coordinator	Team Worker	Resource/ Investigator
Your Score	9	9	5	10	8	4	13	12
Best Fit for role								
Variation								

For my role in the group project, I need to be able to think of new ideas for improvements for the bike this will also lead into communicating well with fellow members of the project as we will need to work together to make sure all our upgrades work in unison with each other. This is good as in the brainstorming phase we can speak together to find common solutions with the same motives to achieve our end goal. Using Belbin's model, we can see I excel much better in these areas as I scored higher in plant, team worker, resource. This entails good communication skills with team members and critical thinking skills for new development. From using this model, I can also see the areas in which I am weakest which is the coordinator role, this shows that I struggle to take lead within the team and take a more directed role so this is something I could improve on so I have more attributes to assist the team with progressing further with the project.

Overall Group Tasks

NSF250 GROUP PROJECT 24/25

TODAY'S DATE 17/11/2024

PROJECT NAME	NS F250 Group Project
PROJECT LEAD	Oilly Gillson
PROJECT START	30/09/2024
PROJECT END	02/04/2025

22%

13%

0%

136

Important Dates

Pembrey Test Day: 01/01/2024
Interim Viva: 10/12/2024 or 11/12/2024
Final Viva: 01/04/2025 or 02/04/2025

[illegible]

My Tasks

Personal Tasks	Brief Description	Task Duration	Start Date	End Date
Initial Measurements/ Beginning of structure for the role in the project	This task is about making rough measurements and creating a guided image of what the product will look like.	2 Hour	30/09/24	15/10/24
Design ideas and pictures for inspiration	Research various intake manifolds and create an image of the final product, provide the group with reference photos so we all understand what I'm going to be doing.	4 Hours	30/09/24	15/10/24
First Design	Make a CAD design of the intake manifold fitting to the rough measurements that have been made.	20 Hours	15/10/24	15/11/24
First Prototype	3D print the first design so we have a physical reference of the vision for the product	3 Hours	15/10/24	15/11/24
Design refinement	Making corrections to the design based of information gathered from having the prototype	25 Hours	15/10/24	15/01/25
Final Testing	Producing another prototype to make sure the corrections worked and that everything works correctly, if they don't redo the previous task and make further adjustments	15 Hours	15/10/24	14/02/25
Production	Produce the final product out of carbon	24 Hours	14/02/25	14/03/25

Preliminary bill of materials

3D printing plastics such as PLA, ABS or SLA resin, the price of this material will vary depending on the amount used which is subject to change due to making corrections and modifications. 3kg of PLA resin is an estimate and the average cost of this specific type of resin is £30 per kilo. This will bring the total cost of this part of the project to £90.

Carbon fibre is the desired material for the final product and the estimated amount of this material is 1kg with an average cost of £75 per kilo. This further estimates about 3 meters of carbon fibre weave will be used to complete the finished product.

This shows that the total estimated cost of my role within the group project will be £165.

I will also need to use SolidWorks; this is a 3D CAD software to create the prototypes. This has no lead time as I can access this via the university.

List of specialist equipment

3D printer, this is a very important piece of equipment for the completion of my tasks as I will need to make various prototypes based of information gathered after producing the first one.

Compression moulding machine, this machine is used to apply the carbon fibre weave too the mould securely, this will make the quality much better than if we were to apply the carbon via hand.

Oxygen pressure sensors, these will help me complete my gateway objective to create the statistical data of improvements to the cold air intake.

Significant Milestones

First Prototypes produced of all parts	This is a good target as it gives us all a realistic aim and is the first piece of physical evidence of our work and allows me to move onto the next tasks with much more fluidity as I will have my vision set on how I want and need it to finish.
Final product	This target will be useful to us as once we have achieved this, we have nearly completed the project so the motivation to finish will increase. Allows the team to work together and finish off the bike ahead of the pre-season test.
Pre-season testing	Complete the first on track testing to fully evaluate the improvements made to the bike. This also gives us confidence going into the first race of the season showing that what we made as a team is working correctly inside a real-world scenario.
First Race of the season	Completing the first race of the season will be an achievement to show the success of the project and show the new capabilities of the bike.

Personal Gateway Objective

Prototype fabrication of the cold air intake, this is an achievable gateway objective. This means that I must have a 3D CAD design model of the intake that fits to the dimensions that were calculated earlier in the project and have this fabricated from the 3D modelling machine. The purpose of this being a gateway objective is to allow for testing of the designs real world functionality, this will make the direction of improvements for the next stage much clearer further leading to a much better final product. This is also a realistic target which will help me maintain vision of the project and not lose motivation due to feeling overwhelmed also allowing for feeling of success when this is completed further increasing aspirations to excel in the work for the project. Having this type of gateway objective is useful for me as I struggle to get the ball rolling so giving my self a realistic target will help me stay on track throughout the entirety of the project.

Increase the overall oxygen pressures in the airbox by 10%, this gateway objective will allow me to aim for a statistical improvement to the bike which will lead me in a direction for success. To complete this I must research the pressure readings from the old intake and when I have made my first prototype I will need to test this and check the data to see the improvement, if there is no improvement then this is also where the design refinement task I have been assigned becomes useful as I will know what I need to do to gain a higher oxygen pressure. This will also help prove that my role in the group project has helped to increase the performance of the bike as I will have evidence of the improvements that were made.

Personal Milestones

3D CAD model	Once the model is made, I will have a clearer understanding of the target to achieve as the visual representation is there
Final Production	This is when my part will be completed, and we can focus on the objective of the bikes performance on track
Pre-Season Testing	This will be the first time my part will be used in the real-world situation so ensuring that it functions correctly will be important
First Race of the Season	After the completion of the first race, we will have the most understanding of the improvements that have been made, also proving the bikes readiness and new capabilities.

Risk management

Not being familiar with the 3D design software could cause major issues for my role in the project as if I am not able to produce an accurate prototype the evaluation and further modifications will also not be accurate. A solution to this problem is for me to complete the basic tutorials for the software and communicate with my peers to see if they will be able to help me out with understanding how to use the 3D model software.

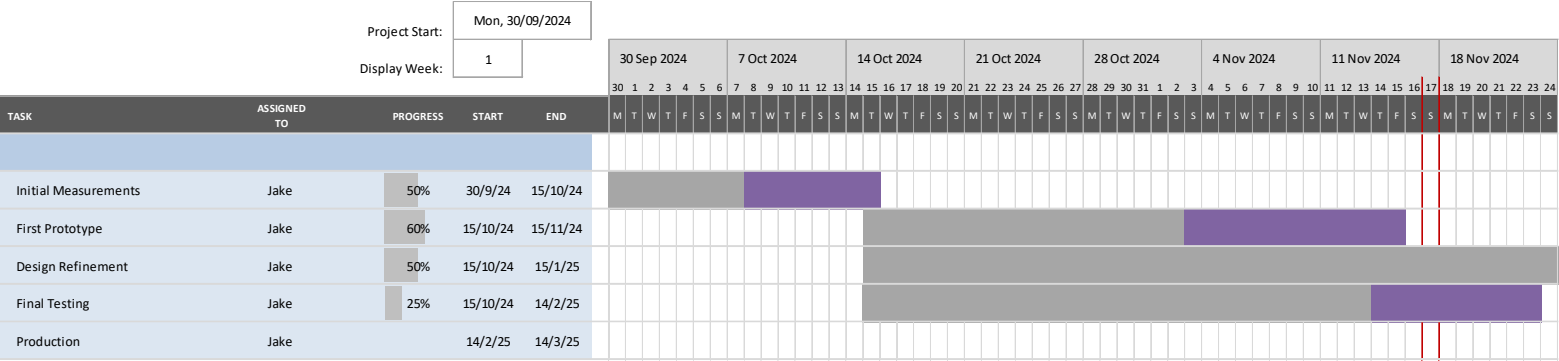
Having no experience with 3D model production will be a major problem for my role as I will not be able to produce the prototypes needed for the evaluation processes. A solution to this is research about the functionality of using a 3D model machine and look for other resources to aid me in the production phase of this project. A strategy for this risk is to acquaint myself with the tools I will be using for my role before the deadlines so that when it comes to me having to do it myself, I am much more experienced and confident in my ability to fulfil my tasks.

Another risk of my role is having limited testing time to have time to make modifications to my production if necessary. A strategy I will be trying to follow throughout the project is getting my tasks done as early as possible to give myself the maximum amount of opportunity to test and evaluate so that I can produce the best results which will be shown in my final production.

Personal Gant Chart

Cold Air Intake

Jake Davies



This Gant chart shows the personal tasks for my role, the start and end dates with progression shown. It also shows duration of each task length. Using a Gant chart is good as it is an easy way to track progress and not lose sight of the goals that you or the whole team have.