

University of Wales Trinity Saint David

Wales Institute of Science and Art



Engineering Technical Report

Workshop and Practice (ACHA4011)

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1 Introduction

This report covers various topics from Health and Safety and Risk Assessments to personal development. There are five topics to cover, plus a conclusion, and then the page of references.

2 Chapter 1 – Health and Safety with Risk Assessment

Within a few weeks of starting at UWTSD, you will be in a workshop using a lathe which is an extremely dangerous tool to use, and the consequences of improper use are potentially life changing. Because of this, you must wear an overcoat so no loose objects hang over the lathe to potentially drag you in. steel -toe-capped shoes/boots are a must too, just in case any heavy objects fall and land on your feet. Safety goggles must be worn to protect your eyes from the swarth coming from the lathe. On the lathe, there is a cover that goes over the chuck so you can't put your hands down onto it. The lathe also will not rotate if the cover is not down correctly. Within your first lesson in the workshop, you will be told about all the emergency stop buttons around the workshop and on the machines. Regarding the lathe, they are bright red buttons on an otherwise white panel so you can easily spot the button. The lathe also comes with a bar brake that you use your foot to use. This stops the lath from spinning to a stand still in a very short amount of time depending on the speed of the lathe. It is important not to obstruct this bar with your foot underneath it too.

Below is a picture of the chuck guard cover that must be down to carry out tasks



using the lath. In the photo you can see that the chuck is holding a cylindrical piece of steel and that is spinning at 770 rpm which supports the need for the overcoat and goggles that must be worn at all times in the workshops as well as the chuck guard being pulled down properly. If there are any forms of injury or near misses, these must be noted and sent to the HSE who will then carry out a full risk assessment to find the best way to prevent that accident or near miss from happening again. This is a legal requirement in United Kingdom of Great Britain and Northern Ireland. Providing you

follow all instructions given by a lecture and wear your PPE, there should be no chance of an accident or near miss occurring in the workshop. When in the workshop, you should always report any hazards you see such as spillages or malfunctions with any machinery. With the lath being a machine to cut metal, the cutting edge is a very sharp piece of material, so it is crucial to ensure you keep any part of your body well clear from the cutting edge too.

3 Chapter 2 – Engineers Role in Society

There are 2 organisations that publish an engineer's code of conduct. These are 'The Engineering Council' and the 'Royal Academy of Engineering'. The Engineering Council is a British organisation based in London, UK and is the regulatory body for engineers across the British Isles (Council, n.d.). The Royal Academy of Engineering is a national charity, academy and fellowship (Engineering, n.d.). The Engineering Council do not claim responsibility directly to the sustainability and environmental issues in motorsport however they do have a webpage about sustainability and going above and beyond in terms of 6 categories:

Contribution: recognising that their impact may have potential global and impacts despite only being smaller activities, understanding the full range of implications across product life cycles, processes and systems that comes with sustainability complications.

Professional and responsible judgment: Considering broad context for work, awareness that they are conflicting and un-measurable aspects of sustainability, adopt a system thinking approach wherever appropriate, ensure sustainable development knowledge is up to date.

Anticipating future legislation changes: Want to go above and beyond where possible with an anticipation for future legislation changes.

Efficient use of resources: Minimise adverse sustainability impacts during the design process.

Find more than one view to solve the sustainability challenges: Proactively engage with everyone who may be impacted by proposed solutions.

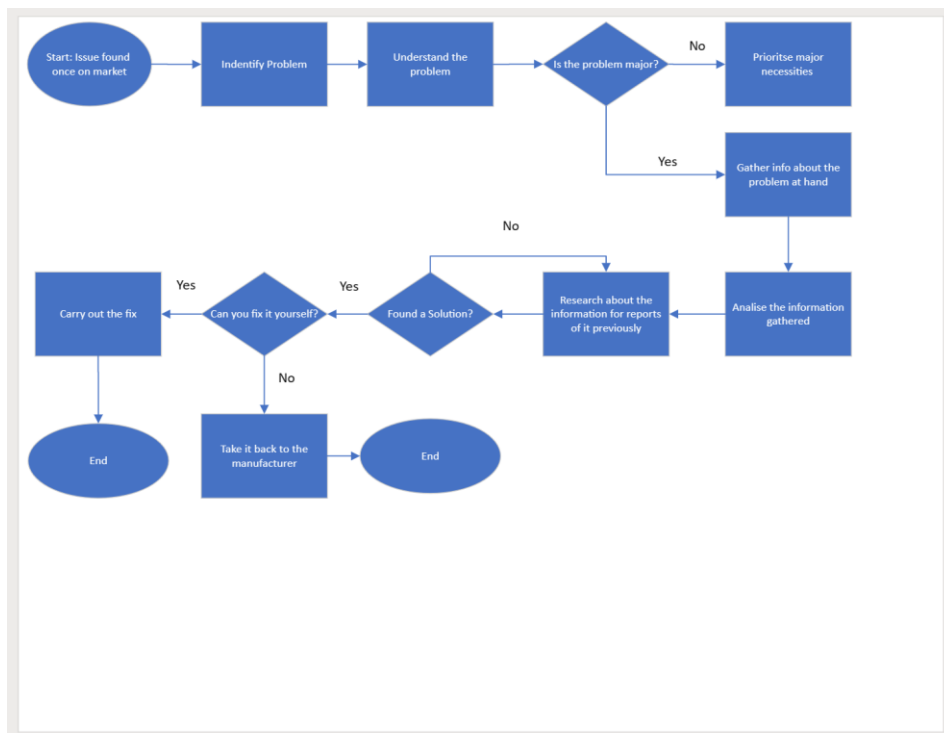
Managing risk to minimise impact and maximise benefit to both people and the environment: Undertake comprehensive risk and benefit assessment before and after a project begins and ends.

(Council, 2021).

The Royal Academy of Engineering's website on sustainability is very bland with a handful of examples the academy has worked on; Research grants, enterprise elements, net zero, reports and publications and building sustainable engineering skills for the workforce. (Engineering, n.d.)

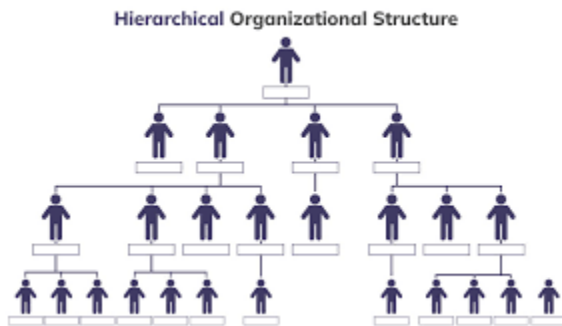
4 Chapter 3 – Problem Solving

Below is a simple flow diagram showing the fundamental steps to solving a fault in a purchased item using Microsoft Visio. Engineers are tasked with solving faults, issues and problems every day, and it is down to them to find a way to effectively fix said problems. Some engineers may even be tasked with carrying out the maintenance and repairs needed to ensure the problem will not arise again in the future for all parts of the same design whether it is a legal obligation, ethical obligation or moral obligation. If the issues remain, much larger problems can arise later when the faulty part is in use and result in major damage either physically to people or assets, such as buildings or vehicles, or financially which would never be good to any company. You must be able to understand the problem in order to fix it, and for that you will need to identify the problem. From the understanding of the problem, you can then gather information and analyse the issue. Using the internet to research the problem can be extremely useful as other people may have had similar or the exact same issue and may have published a step-by-step guide on how to solve it. Some problems may be outside of your skill level so it would be best to get in contact with the manufacturer and request repairs, replacements or refunds as compensation for the trouble you were tasked with fixing. If you can fix it yourself, then it could probably be cheaper to do it yourself however you would risk a warranty that may come with the part.



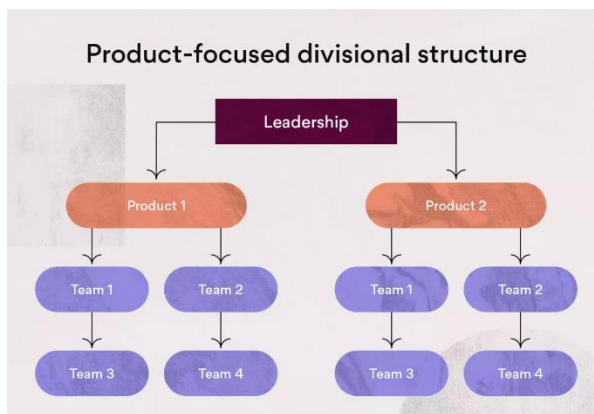
5 Chapter 4 – Team Structure

One team structure I have been a part of is a hierarchical structure.



(Miller & CrowJack, 2022)

This structure was used when I was working at a pub. I believe this is a good structure because everyone knows where they stand in comparison to their colleagues and know who to listen to when they need to carry out specific tasks, which is extremely useful when a colleague may be ‘power-hungry’ or very bossy. It also gives people a clear role to play within the team which when there are lots of things to do which can be quite tedious if there isn’t a clear role. The issues I faced when working in this structure is that in the workplace, I would carry out most roles, such sometimes having to do everything except the cooking due to the need for the necessary qualifications. Another appropriate structure in the pub would be product-focused divisional structure. This structure does get used at the pub during the weekends when the kitchen is a lot faster paced; there would be designated kitchen staff to quickly deliver food to tables while the bar staff could stay behind the bar to continue serving drinks instead of constantly running between the two on quiet days. The issue I found with using this only on the weekends is that sometimes, large groups of people would come in every now and then during the week and then the



bar staff would be extremely tired from taking order, serving drinks and delivering food as efficiently as possible. In the photo to the left, the ‘leadership’ block would be filled by the manager and the ‘product’ blocks would be filled with department managers. The ‘team’ blocks

would be filled with standard staff in the pub as it is not large enough to hire enough people to run lots of different teams of people. In a way, the product-focused divisional structure is largely like the hierarchal structure but with product-focused roles embedded into the structure tree in diagrams like the one above. At a small level of staff such as the pub I once worked at, a structure where everyone does everything may also be appropriate providing everyone has received the necessary training. That way someone can take orders whilst someone else is serving drinks and/or delivering food to tables whilst the manager is doing administrative work elsewhere. That way all roles are filled and if one person is ill, the other staff have received the required training to fill the spot if needed.

6 Chapter 5 – Personal Development Plan

Name: Charlie Wint

Degree: BEng Motorsport Engineering

Previous Qualifications:

Subject	Level	Grade
English Literature	GCSE	5
English Language	GCSE	5
Physics	GCSE	5
Chemistry	GCSE	5
Biology	GCSE	5
Spanish	GCSE	5
Italian	GCSE	1
History	GCSE	5
Computer Science	GCSE	6
Business, Market and Enterprise	BTec Level 2	Merit
Advanced Manufacturing & Engineering	BTec Level 3	DDM (Merit)
Duke of Edinburgh	Bronze	Completed

Previous Experience:

Employer	Date (From MM/YYYY To MM/YYYY)	Location
Sainsbury's	12/2021 – 01/2022	Hanley, Stoke-on-Trent ST1 5SA
The Bush Silverdale	11/2022 – 08/2023	199 High St, Silverdale, Newcastle ST5 6JZ

Short Term Goal:

My short-term goal to achieve within the next 5 years is to graduate university with the best grade possible from my BEng Motorsport Engineering course and potentially progress onto a MEng to give me the best chance at getting a job in the motorsport engineering industry.

Long Term Goal:

My long-term goal is to be working in some form of motorsport discipline based around cars and eventually end up in Formula One. I would be more than happy to work within the WEC in any of the classes whether that's the Hypercar class or LMP2. Even the LMGTE class cars interest me as they are racing cars derived from street models for everyday road use from some of the most well-known car manufacturers such as Ferrari. (FIA, 2023).

Goal	Objective	Resources Required	Measurement	Target Date
Graduate university with the best grade possible.	Complete all assessments to the best of my ability.	Maximum focus, minimum distraction.	Less time playing video games, more time researching course content.	August 2026
Get a job again.	Apply to all jobs within my experience for the best chance.	Commitment and dedication.	Spend a handful of time on Indeed and job search sites as well as company websites.	January 2024
Get a car.	Afford a car, insurance and tax with money saved from a job.	A job and financial responsibility.	Don't buy unnecessary things that I don't need.	August 2024
Get a motorcycle license.	Buy all required equipment and complete the CBT before progressing.	Helmet, protective clothing. CBT certificate.	Don't buy unnecessary things that I don't need.	August 2025
Buy a motorcycle.	Afford a motorcycle, insurance and tax with money saved from a job.	A job and financial responsibility.	Don't buy things I don't need.	January 2026

7 Conclusion

This report covered various topics within engineering from health and safety, engineers in society, problem solving, team structures from personal experience and a personal development plan.

8 References

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