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Assignment 1 Presentation

by Sean Parry

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TIME SUBMITTED	07-JAN-2021 08:49PM (UTC+0000)	WORD COUNT	689
SUBMISSION ID	141170651	CHARACTER COUNT	3303



Project Presentation

By Sean Parry

Sean Parry

Company Background

Tata Steel Europe – Port Talbot

- Worlds leaders in sustainable steel
- Most geographically diversified steel producers
- Operations in 26 countries and commercial offices in more than 35 countries



Project Objective

Objective – Motion control of the conveyor system

Why?

- In order to provide precision and accuracy of the driven conveyor belts, depending on production's requests.
- More efficient and as a result cost effective.
- Less wear and tear on the motor's as they will only operate upon request and for the requested time.

Benefits

- Efficiently run motors
- More control
- Reduce running times
- Fewer faults
- Increase motor life
- Cost effective

Solution 1

Siemens V90 and VFD

Advantages:

- Optimized performance
- Easy to use
- Reliable operation

Disadvantages:

- Expensive
-



Solution 2

Stepper Motor and Driver

Advantages:

- Optimized performance
- Easy to use and easy set up
- Advanced Stepper Control Technology
- Reduced cost

Disadvantages:

- Basic
-



Chosen Option



Option 2

- Stepper Motor and Drive



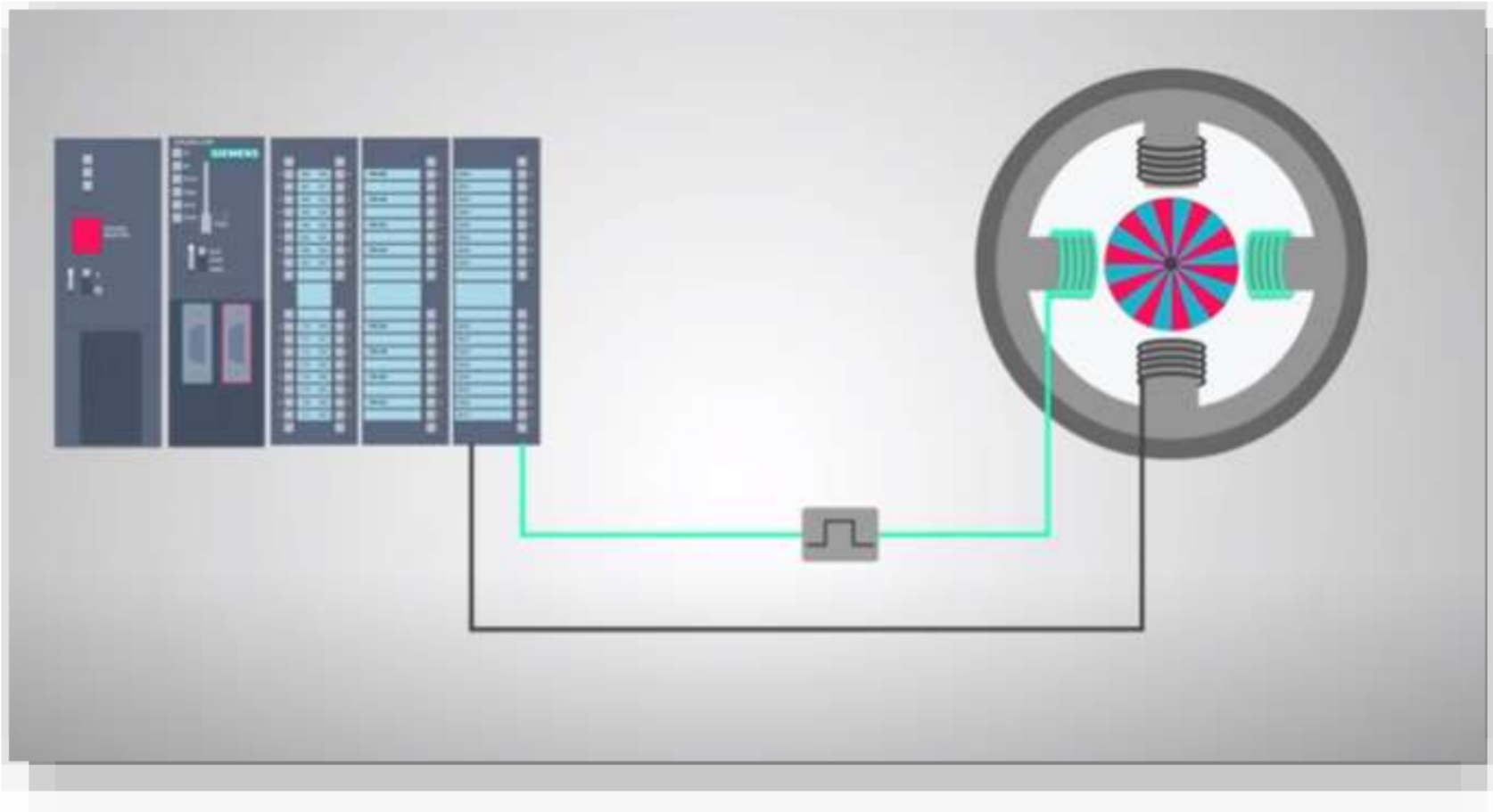
Why?

- The cost – Solution 2 is £65 and Solution 1 is £650
- The assembly process is easier
- More likely to complete by the given time scale

How a Stepper Motor Works

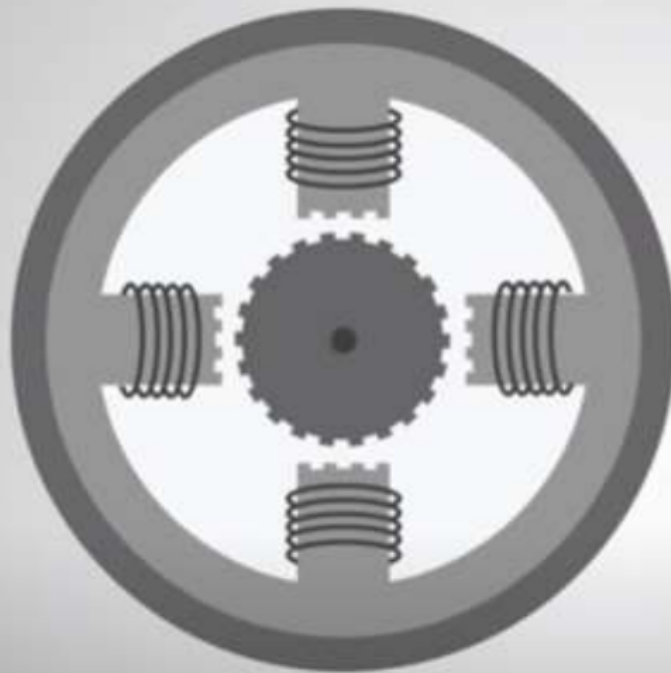
Sean Parry

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Stepper Motors – Open Loop / Servo Motors – Closed Loop
The greater number of poles the greater the accuracy and precision

How a Stepper Motor Works



$$\frac{360 \text{ (Degrees)}}{200 \text{ (Steps)}} = 1.8 \text{ (degrees)}$$

200 teeth on the rotor shaft or 200 full steps per resolution of the motor shaft.
To determine the resolution of rotation the above equation is used.
The result 1.8 degrees of a full step angle rotation.

Stepper Motor and Drive Specifications



Digital Stepper Driver DM556T

- Input Voltage: DC24-50V
- Output Current: 1.8-5.6A
- Micro step (Steps/rev): 400-25600
- Pulse Input Frequency: 0-200 kHz
- Pulse Width(μ s): 2.5



Nema 23 CNC Stepper Motor

- Motor Type: Bipolar Stepper
- Number of phases: 4
- Step Angle: 1.8 degrees
- Holding Torque: 3.0Nm
- Rated Current/Phase: 4.2A
- Phase Resistance: 0.9 Ω
- Inductance: 3.8mH +/-20%(1KHz)

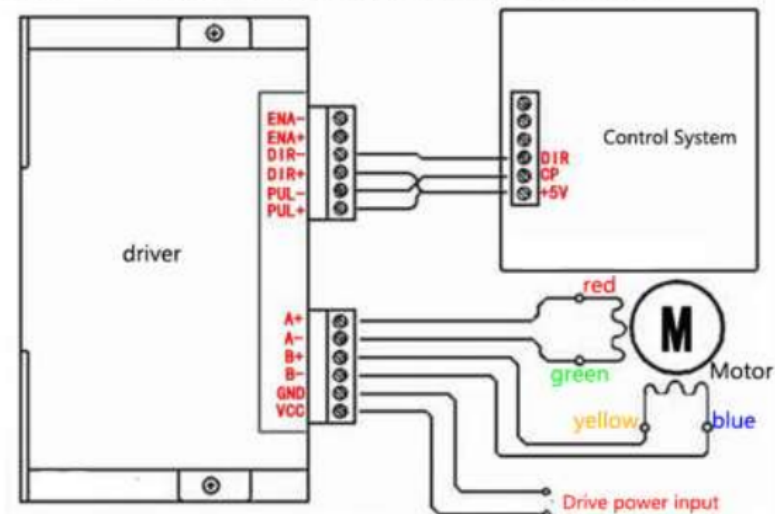
Specifications

The driver and motor can be upgraded to whatever power is needed and easily exchanged for a servo motor.

With use of the PLC, HMI and Driver, create a specialist program in order to drive and control the conveyor.

The HMI screen will provide controls in order to control the speed, direction and positioning.

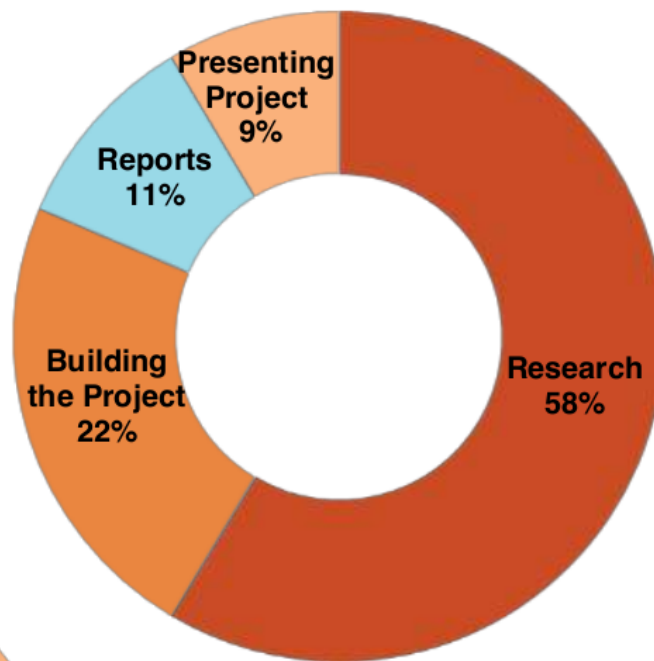
System wiring diagram (with a total anode connection example)



Test and Plan

Test Table					
	Test 1	Test 2	Test 3	Test 4	Test 5
Speed (RPM)					
Direction (C/AC)					
Positionig					
Program working? (Y/N)					
HMI working? (Y/N)					
Expected Outcome					
Actual Outcome					
Health and Safety Requirements met? (Y/N)					
Pass/Fail					
Engineer Signature:					

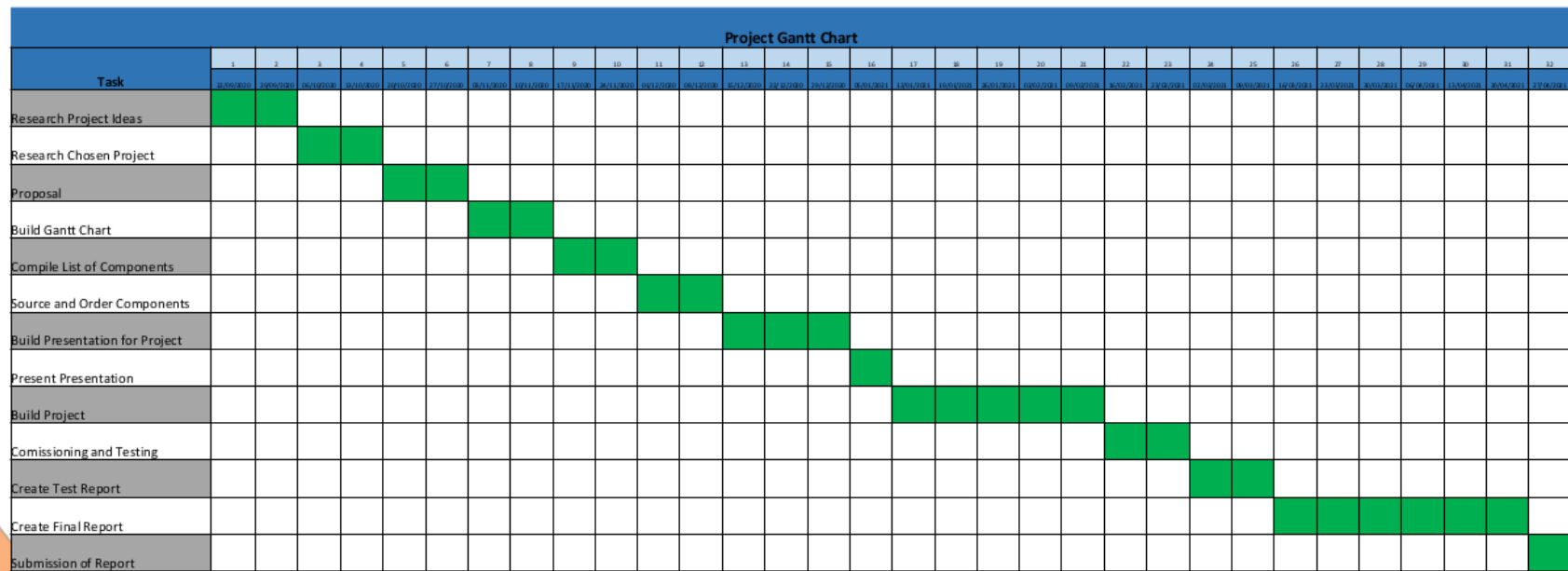
Project Management

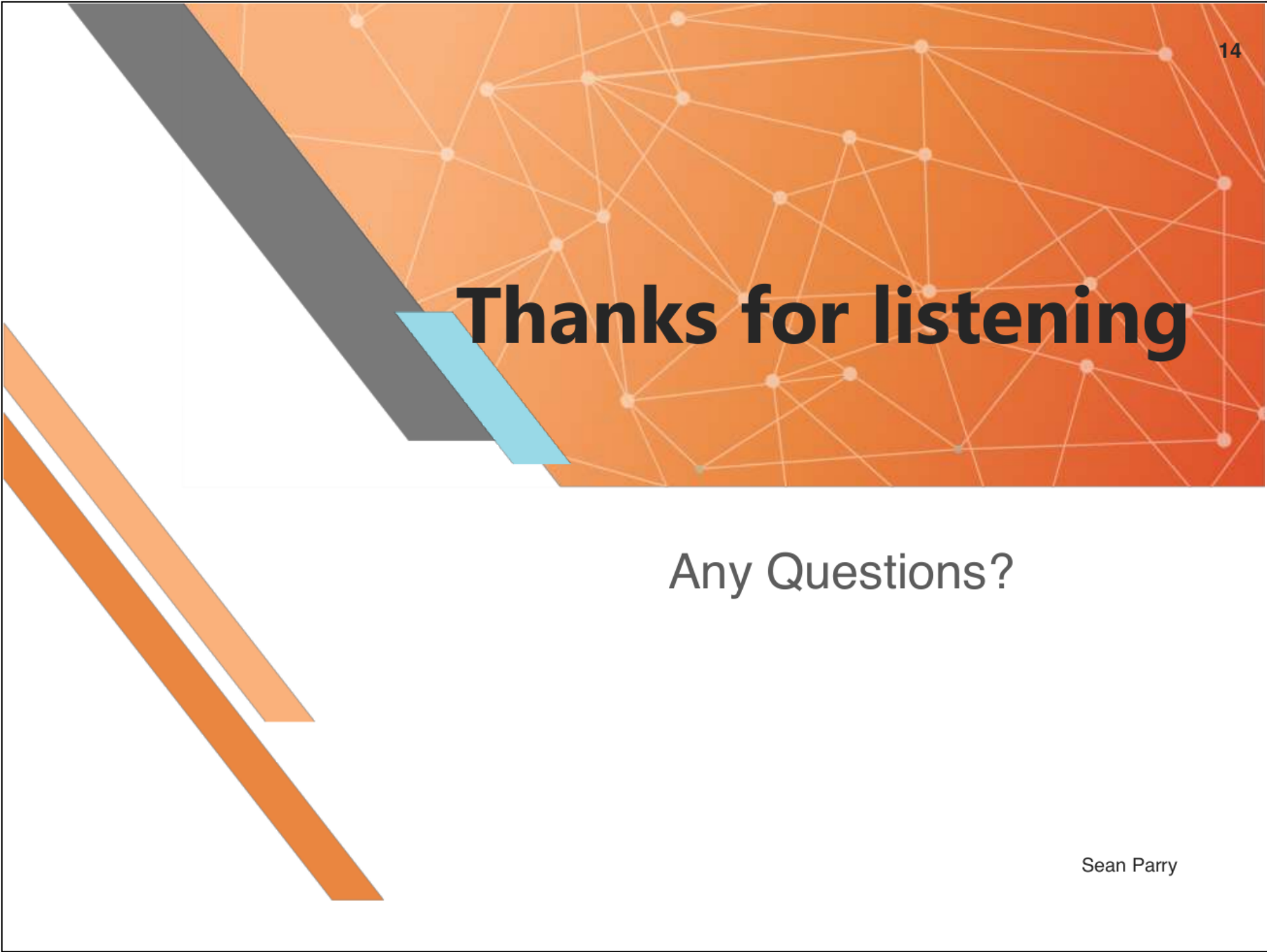


Managing the Project

- Gant charts to manage the time scale and project progression
- Log sheets to record a detailed explanation of what has been achieved each week throughout the project
- Record sheets/receipts of all costs
 - All data/information sheets will be stored and kept throughout the duration of the project

Project Plan





Thanks for listening

Any Questions?

Assignment 1 Presentation

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

Instructor

80/100

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GRADING FORM: CSG-RUBIC

SEAN PARRY

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RESEARCH-INFORMED LITERATURE

-  Good amount of research carried out which is evident in the slides and the explanations. Plenty of relevant details included in the explanations. 9/10
Project background and context was good with relevant examples of industry given in the discussion. 8/10
- 17/20**

KNOWLEDGE AND UNDERSTANDING

-  Project purpose was very clear and a good confident explanation was delivered. 4/5
Project constraints were highlighted and weighed up against the costs. Codes of practice and standards were explained in the questioning section which included the intellectual property law. 3.5/5
Environmental and
- 23/30**

sustainability was explained in the design and purpose of the project and covered in the questioning section. 3.5/5 Functional design was very good and very well explained. 3.5/5 Response to questions was excellent. 8.5/10

ANALYSIS

 Problem was clearly defined and industrial examples were used in the discussion. The level of detail was very good. 4/5 Functional design specification was explained clearly and good attention to detail. 8.5/10 A very good argument was given for the choice of the final solution with a good cost analysis. 3.5/5

16/20

PRACTICAL APPLICATION AND DEP.

 Design specification was good and included plenty of technical detail. The explanations were very good and showed good evidence of research such as matching driver and motor. 4/5 The argument for critical choice of solution was excellent with good relevant detail. 8.5/10 The project test plan and Gantt chart for the timeline plan were good. The Gantt chart included the work breakdown but needs some correction to the timeline. 3.5/5

16/20

SKILLS FOR PROFESSIONAL PRAC.

 Slides were very good and very well set up. Plenty of evidence of research throughout. 4/5 Overall delivery was excellent. 4/5

8/10

