

1809802

by Mason Morgan

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1. Executive Summary

This report has been written to cover the following topics. The structure as such will follow the same pattern as described below. *You should be summarising the project not the report*

An introduction into the report explaining the issue at hand will firstly be explained. The introduction *The project proposal is not an introduction.* will be titled the Project Proposal. The Project Proposal will firstly cover the project title, a submission date & an estimated budget. A paragraph will then be written into the project description, followed by the deliverables of the project and lastly deadline / plan & approach to the project. The project proposal must then be signed off by the lecturer the person overseeing the project and the person overseeing the person completing the project.

Next, all Project Background & Problem Definitions & Constraints will be covered. This section will include the following titles.

- The project backgrounds
- The problem definition
- Any constraints

To understand what needs to be involved in the project, a Functional Design Specification along with a Test Plan will be constructed.

The Literature Review and Choice of Final Solution will then be covered. 3 separate ideas to complete the same problem will be thought of. To pick 1 solution comparisons will be made between each of the 3 options along with a cost spreadsheet for each option.

The project Planning, Work breakdown and Management Techniques paragraph will then be constructed. This paragraph involves the following topics.

- Management techniques
- Applying knowledge of engineering management principles
- Commercial context
- Project & change management
- Relevant legal matters

Clearly there to explain what guidelines need to be followed & covering the wider context of the project.

All images need a reference and any information gathered from external sources must be cited using Harvard reference method.

A Conclusion summarising of all the data captured will then be written.

The appendix is also a crucial part to conclude the report. This is where the following is kept.

- Written project proposal with signatures
- Risk assessment
- Radial chart
- Gantt chart
- WBS chart
- Costing spreadsheet
- All logbooks

This is not an introduction. The proposal is in the appendix.

2. Introduction

STUDENT NAME: MASON MORGAN
PROJECT TITLE: GLASS BOTTLE LINE AUTONOMOUS PRODUCTION
DATE: 07/10/2022
BUDGET: £2000

Project Description

The project is based in a local company that produces mineral water. Currently, the glass production line is the most underperforming line and needs drastic improvements. Due to the Line being so inefficient, order deadline dates are slipping, the quality of product is slipping, the shift targets are becoming harder and harder to meet and the amount of line downtime is increasing.

The Health & Safety of the production line is very poor. The glass line is the oldest line and needs improvements to avoid future injury and / or damage.

The objectives of the project are therefore, to improve the efficiency of the line production. The shift targets must be exceeded more consistently. Monthly reviews will be used to access data & monitor line improvements to develop the line thus continuously. It is important to be able to monitor the status of all 7 machines to reduce downtime and help the operators manage the entire production line more efficiently.

The Deliverables of the project

- To create a new control panel which monitors the status of each machine
- Monitoring the downtime of the machines through counters on a HMI screen

Deadlines / Plan / Approach

The project will be broken down into a timeline to better manage the progress of the project over a 6-month period. The completion date will be end of March of 2023.

The following personnel will also be involved with the project. Rhiannon Gallacher who will be overseeing the project and giving myself advice into project management. If necessary, I will source external help from our regular contractor if help is needed.

Agreement for project proposal

Student Signature: _____

Industrial Supervisor Signature: _____

Academic Tutor Signature: _____

3. Project Background Definition & Constraints

3.1. Project Background

The project is based in a company that produces mineral water and distributes it across the United Kingdom and the water is sourced from a near spring.

The oldest line on site is the glass bottling line also known as Line 2 which was once used as a milk bottle line.

Since 2018, a larger company has purchased a majority stake in the company which now allows to have the funding, needed to keep up with demands. However, now under the new jurisdiction, there are much higher standards that need to be met meaning changes will be needed to the glass bottling line in the coming months.

The glass bottle line aims to produce 11 pallets in a 12-hour shift whilst working in conjunction with our plastic bottle line.

Over the years new machinery has been added to Line 2 like the EBI system. EBI stands for Electronic Bottle Inspection system. The system will check the bottle for a discrepancy like

The plastic bottles are produced on site but, the glass bottles are bought in from a manufacturer, placed on the line in which they are further filled, capped, and wrapped.

The glass bottle line is the most extensive product that the company produces. However, the turnover is rather poor in comparison to the other lines.

3.2. Problem Definition

The Line is far too inefficient due to the lack of maintenance of machines. The first protocol for the line is to install a monitoring system to really understand where most of the downtime is based. From here management can make the decision on what improvements on what machines need to be.

Currently, there is only 1 operator who runs the line which comprises of looking after 7 separate machines whilst filling up the line with raw materials. The whole idea of the implementation of the monitoring system is to improve efficiency.

3.3. Constraints

Ethical Engineering

This section reads like part problem definition and part FDS

- There are only 12 hours in a shift to hit or go past the pallet target which rely heavily on the efficiency of the line.
- There's a limited number of technical experienced operators on Line 2
- Pallet of glass is put on at one time but once it runs out the depalletiser must stop production to reload it.
- Labeller machine must be started independently once the rincer infeed runs empty.
- The guides are in poor condition and can't be set for each product because of this causing higher amounts of inefficiency.
- Filler heads often suffer with low fill levels due to a poor air system behind it.

(Boulay, 2022) *Is this really a source for this information?*

Sustainability

This section reads like an FDS

- To meet the customer standard all glass bottles sent out the door must be checked by the electronic bottle inspection unit.
- To ensure bottle are aesthetically pleasing and attractive all labels must not be creased on the bottles.
- All bottles must be filled to a specific height and must be checked by the heuft system which rejects bottles with no caps and underfills.
- The consideration of a power saving mode must be considered throughout the project to be more efficient.
- To investigate where bottles are being damaged. By reducing the number of bottles being damaged means reducing the amount of money spent buying the bottles and recycling the damaged glass.

(Heywood, 2013) *Is this really a source for this information?*

Legal / Commercial

- Health and safety regulations are not all up to date with current standards
- Filler carousel cannot be run whilst the vertical lift motor cable is connected.
- Machine must be cleaned once every week or if the line is down for more than 2 hours it must be flushed out to prevent bacteria from growing and contaminating the water

(Tony Dugdale, 1996)

This can't be a source for this information. You should have researched legal or commercial standards relevant to your project.

4. Functional Design Specification & Test Plan

4.1. FDS

Use the third Person

In this section a Function Design Specification has been created to explain the criteria that my project must meet. This allows the reader to quickly establish a list of tasks that I must carry out to be successful and can be noted as Table 1 below (4.1). *You don't need to give a running commentary on why you are writing this section. Do not write in the first person as it is unprofessional.*

Additionally, a test plan has been attached below providing a more in-depth description of the individual tests and what the expected outcome must be. This has been noted as Table 2 below (4.2).

ITEM NO.	DESCRIPTION
4.1	To be able to isolate the panel & any connected circuitry from an isolator switch that is easily accessible. (Rowlinson, 2005)
4.2	To visually monitor the statuses of all machines through interactive technology. The screen will display a sketch of the entire line from an above view with LED indicators on each machine which allows the operator to establish which machine is in fault & which machine is running. Additionally, a second screen will be constructed to visually monitor the amount of downtime on each machine for each 24hrs through counters. A reference can be seen later in this report denoted by section (9.8)
4.3	To determine the amount of downtime produced by the depalletiser machine. To start a counter when the machine goes into fault which will accumulate a total amount of downtime after 24hrs and to sound a buzzer to alert a member of staff.
4.4	To determine the amount of downtime produced by the Labeller. To start a counter when the machine goes into fault which will accumulate a total amount of downtime after 24hrs and to sound a buzzer to alert a member of staff.
4.5	To determine the amount of downtime produced by the filler. To start a counter when the machine goes into fault which will accumulate a total amount of downtime after 24hrs and to sound a buzzer to alert a member of staff.
4.6	To determine the amount of downtime on the line by gathering data into the SMI (pack packing system). To start a counter when the machine goes into fault which will accumulate a total amount of downtime after 24hrs and to sound a buzzer to alert a member of staff.

4.7	To determine the amount of downtime on the line by gathering data into the Palletiser. To start a counter when the machine goes into fault which will accumulate a total amount of downtime after 24hrs and to sound a buzzer to alert a member of staff.
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Table 1: Functional design specification table

4.2. Test Plan

ITEM NO.	DESCRIPTION OF TEST	EXPECTED OUTCOME
4.1	Testing the system for dead.	- When the isolator is operated, the panel will be dead.
4.2	To view the statuses of all machines through interactive technology	- Being able to monitor the statuses of all machines. - To be able to monitor the amount of downtime for all machines at once.
4.3	To break the interlock of the depalletiser machine to recreate a breakdown signal scenario.	- The interlock has been broken and the machine determines a fault. - A signal is sent to the monitoring machine. - The PLC input on the device switches & indicates this by illuminating green. (Panel must be open to visualise this) - The user watches the home screen to see that a red LED start flashing on the animation of the line to indicate that the machines are now in fault.
4.3.1	To break the interlock of the depalletiser machine to recreate a breakdown scenario	- A signal will be sent to the PLC input which will indicate by flashing green. - Activity will be active on the second screen of the monitoring system.

		- The counter for the faulty machine will start counting in conjunction to when the machine goes into fault. - The test carried out will be expecting the system to show a count for 6 hours.
4.4	To break the interlock of the Labeller machine to recreate a breakdown signal scenario.	- The interlock has been broken and the EBI and determines a fault. - A signal is sent to the monitoring machine. - The PLC input on the device switches & indicates this by illuminating green. (Panel must be open to visualise this) - The user watches the home screen to see that a red LED start flashing on the animation of the line to indicate that the machines are now in fault.
4.4.1	To break the interlock of the Labeller machine to recreate a breakdown scenario	- A signal will be sent to the PLC input which will indicate by flashing green. - Activity will be active on the second screen of the monitoring system. - The counter for the faulty machine will start counting in conjunction to when the machine goes into fault. - The test carried out will be expecting the system to show a count for 40 minutes.
4.5	To break the interlock of the Filler machine to recreate a breakdown signal scenario.	- The interlock has been broken and the EBI and determines a fault. - A signal is sent to the monitoring machine. - The PLC input on the device switches & indicates this by illuminating green. (Panel must be open to visualise this)

		- The user watches the home screen to see that a red LED start flashing on the animation of the line to indicate that the machines are now in fault.
4.5.1	To break the interlock of the Filler machine to recreate a breakdown scenario	- A signal will be sent to the PLC input which will indicate by flashing green. - Activity will be active on the second screen of the monitoring system. - The counter for the faulty machine will start counting in conjunction to when the machine goes into fault. - The test carried out will be expecting the system to show a count for 30 minutes
4.6	To break the interlock of the SMI machine to recreate a breakdown signal scenario.	- To be able to monitor the status of the machine through an LED on the HMI screen. - Visually the operator should be able to determine the machine status through a flashing LED. - The operator can determine that if the LED is red the machine is in fault. - If the LED is in green the machine is in a running state.
4.6.1	To break the interlock of the SMI machine to recreate a breakdown scenario	- A signal will be sent to the PLC input which will indicate by flashing green. - Activity will be active on the second screen of the monitoring system. - The counter for the faulty machine will start counting in conjunction to when the machine goes into fault. - The test carried out will be expecting the system to show a count for 7 minutes

4.7	To break the interlock of the Palletiser machine to recreate a breakdown scenario	- To be able to monitor the status of the machine through an LED on the HMI screen. - Visually the operator should be able to determine the machine status through a flashing LED. - The operator can determine that if the LED is red the machine is in fault. - If the LED is in green the machine is in a running state.
4.7.1	To break the interlock of the Palletiser machine to recreate a breakdown scenario	- A signal will be sent to the PLC input which will indicate by flashing green. - Activity will be active on the second screen of the monitoring system. - The counter for the faulty machine will start counting in conjunction to when the machine goes into fault. - The test carried out will be expecting the system to show a count for 18 minutes

Table 2: Test plan descriptions

5. Literature Review

For the literature review, 3 options have been considered. The 3 options consist of different ways to solve the same problem. Option 1 can be found in 5.1, Option 2 in 5.2 and Option 3 in 5.3 *unnecessary words*

5.1. Option 1

Using a Siemens Logo to monitor machines and derive total downtime

Use the third Person

My chosen option will consist of an HMI & PLC which displays 7 different machine states in the form of an interactive screen display. The screen will also be designed in such a way to help analyse breakdown durations for each machine

(ATO, 2022)

Counters will be displayed on the PLC to help track the amount of downtime that the machines accumulate daily and as shown below from the block diagram an above view will show each machine with a Red LED displaying the machine has gone into fault.

(CISCO, 2022)

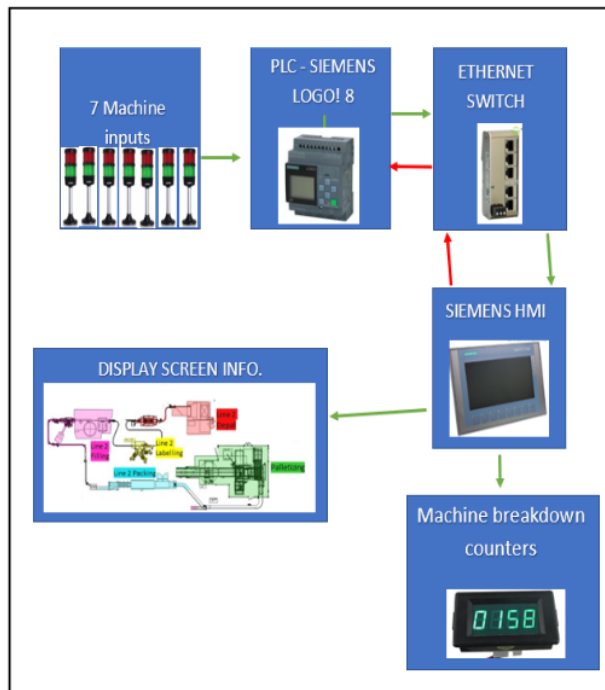


Figure 1: Problem solution no.1

Use the third Person

Use the third Person

The reason for the selection of this option is because it offers myself all the capabilities that I need to both display faults and track breakdown data.

(Bolton, 2015)*How can this source be the basis of the above sentence?*

The reason why the Siemens Logo was selected instead of another brand or model was firstly, Siemens Controllers are only used on site, and ~~mine~~ are the most researched controllers which also offer help & support online.

Use the third Person

(GEORGE BROWN , 2021)*What did George Brown say about it?*

Write in the third person

I've only ever used Siemens; therefore, it is the correct choice to go for to achieve successful results.

Punctuation Error

The Logo is the cheaper option out of all the controllers & yet it is more suited to smaller applications like mine. The Logo offers a direct plugin of 230VAC supply with 8 DC inputs and 4 DC relay outputs.

this could allow me to introduce a buzzer to signal when a machine is in fault if I wanted.

Write in the third person

(Automation24, 2022)

The siemens 7" display offers me to have multiple different screens to program & customise. I want to have the option to setup up the following screens...

Write in the third person

Write in the third person

Screen 1: Monitoring screen. To monitor the statuses of all machines at once

Screen 2: To view & analyse live data of each machine

(Kamel, 2014)

5.2. Option 2

Option 2 again, uses a Siemens Logo but the version without the display. This option does not offer the HMI screen option. The PLC has a programmable display that allows the user to navigate through settings.

The LOGO's digital display will be used to alert the operator that a fault has occurred on one of the machines by sounding a buzzer. The display will also read the machine that has gone into fault.

(SIEMENS , 2022)

The whole idea of this option is to integrate the software into an engineering computer via the internet & the cloud. If an engineer is stationed at a computer, they will get a notification that one of the machines are in fault and they can address this issue almost instantly, cutting down on the downtime massively.

(SIEMENS , 2022)

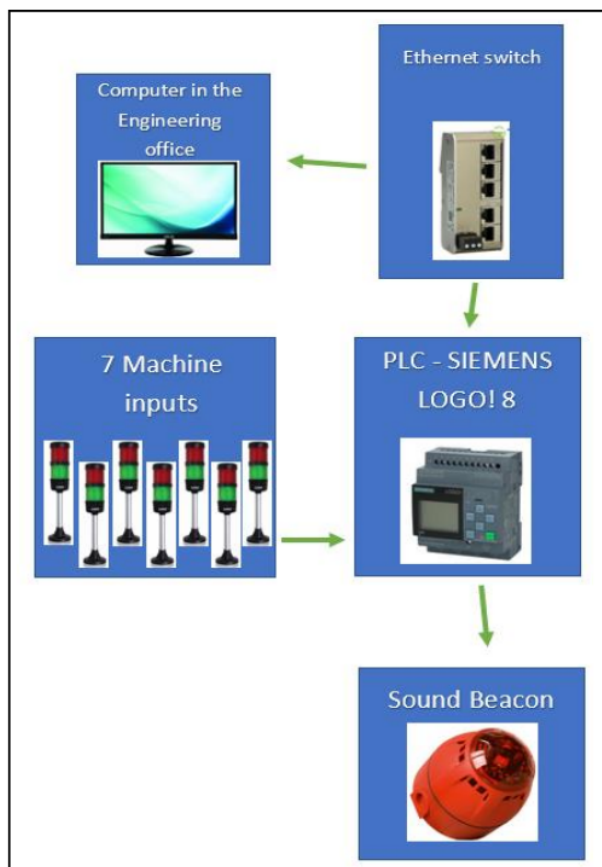


Figure 2: Problem solution no. 2

5.3. Option 3

Option 3 provides another solution but in the form of different manufacturers. This time a Mitsubishi based PLC will be used which is a fraction of the price in comparison to the LOGO seen above.

The controller consists of 5 inputs and 4 outputs but offers very similar results to the siemens LOGO at a fraction of the cost. (ebay, 2022)[Not a credible source](#)

The PLC is not capable of creating counters to display on the HMI so instead uses external counters. The external counters will conduct the same process in counting in seconds for when it receives an input.

The Mitsubishi PLC is compatible with the HMI branded DELTA. The delta screen will be used for the same purposes as the Siemens and will be used to display live data of the machines in fault.

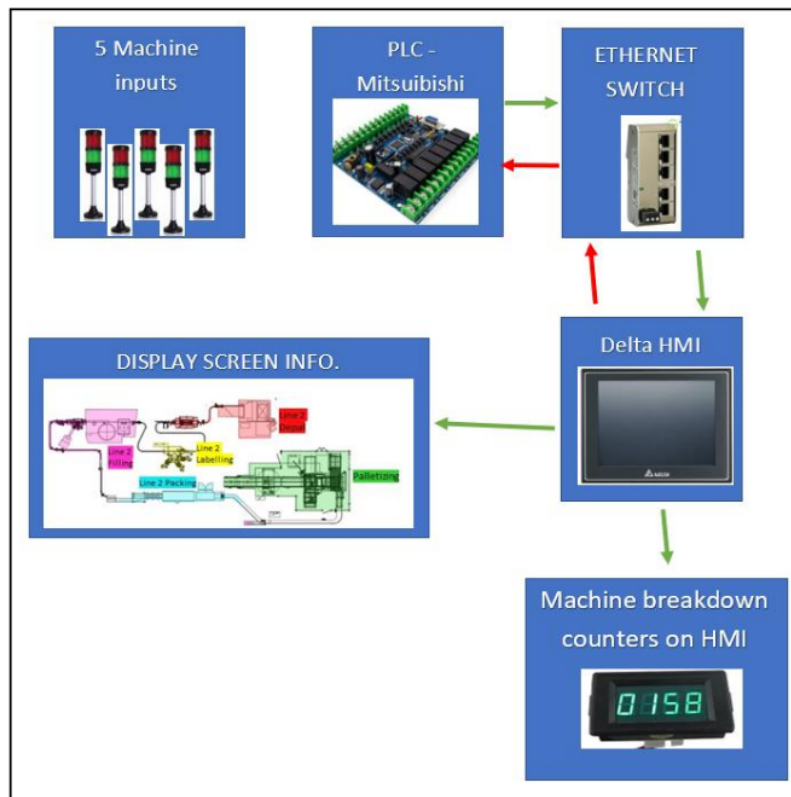


Figure 3: Problem solution no. 3

5.4. What do these options have in common?

DESCRIPTION	OPTION 1	OPTION 2	OPTION 3
PLC	SIEMENS LOGO W/ DIGITAL DISPLAY	SIEMENS LOGO W/ DIGITAL DISPLAY	Mitsubishi
Display	7" DISPLAY HMI	24" Monitor	12" DISPLAY HMI
PLC input supply	230VAC	230VAC	24VDC
Counters	Internal counters	Internal counters	External counters
Cost of project	Between £1200 < > £1500	Between £600 < > £800	Between £400 < > £700
Integration of sensors	NO	YES	YES
Sensor supply (V)	24VDC	24VDC	24VDC
PLC Inputs	Allows for 8 DC inputs	Allows for 8 DC inputs	Allows for 5 DC inputs
PLC outputs	Allows for 4 NO relay contacts	Allows for 4 NO relay contacts	Allows for 4 NO relay contacts
Integrates other systems	NO	NO	YES
PLC manufacturers	SIEMENS	SIEMENS	MITSIUBISHI

Table 3: Comparison table for 3 solutions

How do you justify your choice of solution from this table?

What is your scoring system?

6. Project Planning, Work breakdown & Management Techniques

6.1. Management techniques to be implemented

To prove that this project has been a success throughout the construction & after the project has been completed the relationship between Engineers, Management and Operators must be a crucial part to this project being as efficient as possible.

(Business Development: A Market-Oriented Perspective , 201)

Write in the third person

Write in the third person

Furthermore, I'm also looking to achieve the business objectives. It is a priority of mine to always obtain a healthy & constructive team atmosphere. To do this, regular meetings will be conducted which will involve a member of the management team.

(Harvard Business Review , 2016)

The useful factor of these meetings means that progress can be reviewed more consistently. In this meeting the following can be discussed,

- Stock monitoring
- Machinery downtime
- Health & Safety issues
- Quality issues
- Any issues that need to be raised
- General happiness of staff
- Improvements to the line

To monitor continuous improvements for this complex problem of downtime a lot of focus will be projected into the machine monitoring system. The objective is gauge how much downtime we're accumulating over the weeks & to close on what areas are affecting the company the most.

By putting more focus on the monitoring system, it will give us much needed data to understand where the improvements can be made.

(Havard Business Review, 2016)

Understanding what the system is capable of is very important also. Knowing the capabilities of the system means endless improvements on the company.

(Hague, 1999)

6.2. The Engineering Management principles

The Engineering Management Principles can be broken down into 5 points, these are.

Principles govern process. Systems engineering and its management is facilitated through the development of processes. It is important to note that individuals need to be both accountable for their actions and given a level of discretion in the application of high-level processes. (Medium , 2023)

The Second being, Seek alternative systems perspectives. This involves exploring a range of systems perspectives, viewpoints, or abstractions, including the additional capability and uncertainty that is uncovered by incorporating humans in systems.

(Bridging the evidence Gap, 2010)

Thirdly, Understand the enterprise context. It is essential to understand the organisations objectives and constraints when determining the optimal solution.

(Hinrichs, 2015)

Fourthly, integrating systems engineering and project management. This can be summarised as, the breakdown of the required activities and the creation and delivery of a casual network of such activities against defined timescales.

Lastly, Invest in the early stages of projects. For any activity in a project there will be a correct time to undertake it. Too early wastes resources while too late can lead to downstream adverse impacts.

(ARDEN University , 2023)

You should have made references to your Work Breakdown Structure and Project plan in the appendix

7. Conclusion & Recommendations

To conclude, it can be said that a lot has been identified from this report. At the introduction stage important information was gathered to set the project up for success, this included undying exactly what the project was going involve, how it would benefit the company & how it was to be carried out. This introduction was written in the form of a project proposal *You should have introduced the report at that point.*

Moving onto the project background definitions & constraints, this gave the opportunity to really gather detail into the root cause of the problem and why this issue was effecting the workplace. It also allowed other considerations to be made into ethical engineering, sustainability & legal / commercial matters.

Now that an understanding of the project problem was understood, a functional design specification was created which created a list of points that the project had to meet to be successful. This was then followed up by a Project plan which went into further detail on the points explored in the FDS, this meant that a description of each test was written with the expected outcome. These documents are clinical & need to be as accurate as possible as reference to these will be made towards the end of the construction of the project.

which solution was chosen?

A literature review was later created which explored 3 possible solutions to solve the 1 problem. Through research of these 3 separate solutions details was gathered. A block diagram was firstly created for each which gives the reader a clear indication of each solutions breakdown. A brief description followed on each summering how each solution solved the 1 problem.

Poor justification of final choice

A comparison list was later created to understand where each solution was similar.

No references to WBS or Gantt chart in main report although they are in the appendix

It is important to understand the planning, breakdown & management techniques for such a task, hence, the management techniques to be implemented were explored in further detail with data backing the engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.

The appendix included a lot of data for the report. A risk assessment needed to be created ensuring that degree of safety was carried out, this involved working with unsafe voltages around a hazardous environment which was heavily water based.

A radial chart was constructed to pick which of the 3 options was the most suitable to tackle the solution. This was followed by a Gantt chart that allowed the project to be planned for the next 3 months. A WBS chart was also created to breakdown each stage of the project.

A costing spreadsheet could then be seen which broke down each singular item

This section contains a summary of report content and is not a conclusion. What are your recommendations?

8. Citation List

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9. Appendix

9.1. Project Proposal

STUDENT NAME: MASON MORGAN
PROJECT TITLE: GLASS BOTTLE LINE AUTONOMOUS PRODUCTION
DATE: 07/10/2022
BUDGET: £2000

Project Description

The project is based in a local company that produces mineral water. Currently, the glass production line is the most underperforming line and needs drastic improvements. Due to the Line being so inefficient, order deadline dates are slipping, the quality of product is slipping, the shift targets are becoming harder and harder to meet and the amount of line downtime is increasing.

The Health & Safety of the production line is very poor. The glass line is the oldest line and needs improvements to avoid future injury and / or damage.

The objectives of the project are therefore, to improve the efficiency of the line production. The shift targets must be exceeded more consistently. Monthly reviews will be used to access data & monitor line improvements to develop the line thus continuously. It is important to be able to monitor the status of all 7 machines to reduce downtime and help the operators manage the entire production line more efficiently.

The Deliverables of the project

- To create a new control panel which monitors the status of each machine
- Monitoring the downtime of the machines through counters on a HMI screen

Deadlines / Plan / Approach

The project will be broken down into a timeline to better manage the progress of the project over a 6-month period. The completion date will be end of March of 2023.

The following personnel will also be involved with the project. Rhiannon Gallacher who will be overseeing the project and giving myself advice into project management. If necessary, I will source external help from our regular contractor if help is needed.

Agreement for project proposal

Student Signature: _____
Industrial Supervisor Signature: _____
Academic Tutor Signature: _____

Figure 4: Project Proposal

9.2.

Name of assessor	MASON MORGAN	Date	22 nd DECEMBER 2022											
Time	13:53	Work area	Princes Gate (Shop Floor / Line 2) – Filler area											
Task Being Assessed	The enclosure which houses the electrical equipment is being questioned as adequate and safe to be in that area													
What is the hazard?	Who might be harmed?	How might people be harmed?	Existing risk control measures	Risk rating		Additional controls	New risk rating (Residual)		Action/ monitored by whom?	Action/ monitored by when?				
Installation of equipment and devices powered by 230VAC in a hazardous area which is subject to a lot of water splashes and spillages	Any persons in the area who are working on or near the filler or labeler stations	When working near the area, if there are a lot of water spills and splashes this could meet the devices which could cause device failure and potentially electric shock, if the person comes in contact with electrical current and water.	Staff are provided with PPE and instructed to keep the area free from water	L	4	5	20	To install a waterproof enclosure to house all the equipment and to install all cable glands underneath the enclosure to avoid water ingress.	L	1	1	2	The plant manager will ensure all training is completed and the HR manager will make sure that health surveillance is completed.	MARCH 2023 (3 MONTHS)
				C		R								
Review date	22 nd DECEMBER 2021			Signature		MASON MORGAN								
Training Provider name				TSW Training										

Figure 5: Risk assessment

9.3. Scoring matrix for solutions

Where is the scoring table from which this diagram was produced?

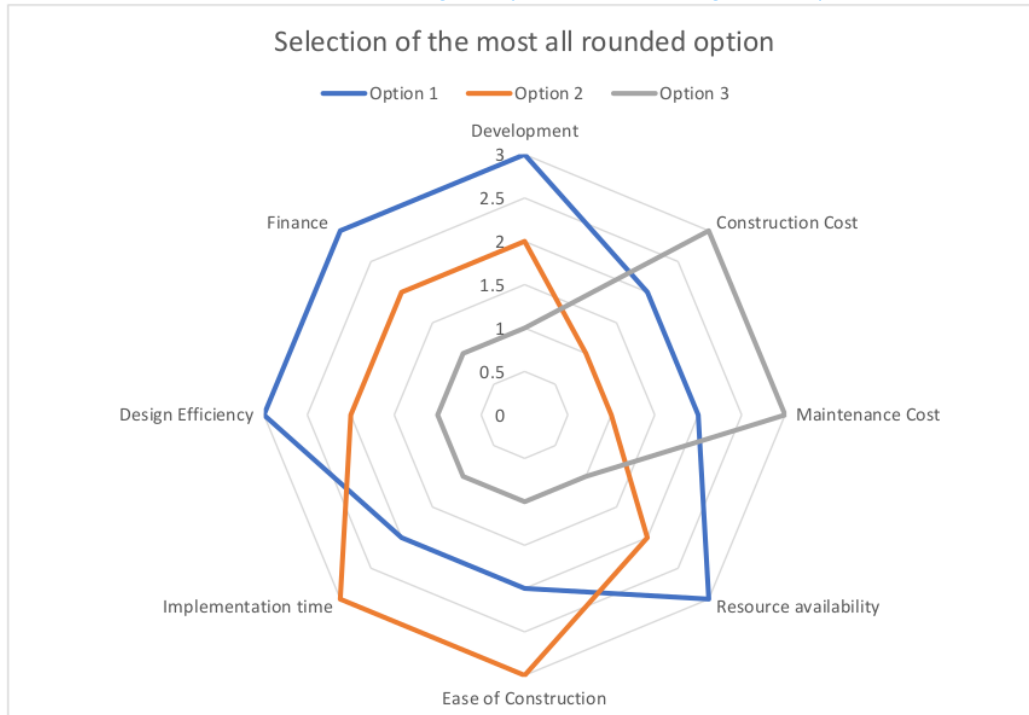


Figure 6: Scoring matrix comparing all 3 options

9.4. WBS chart

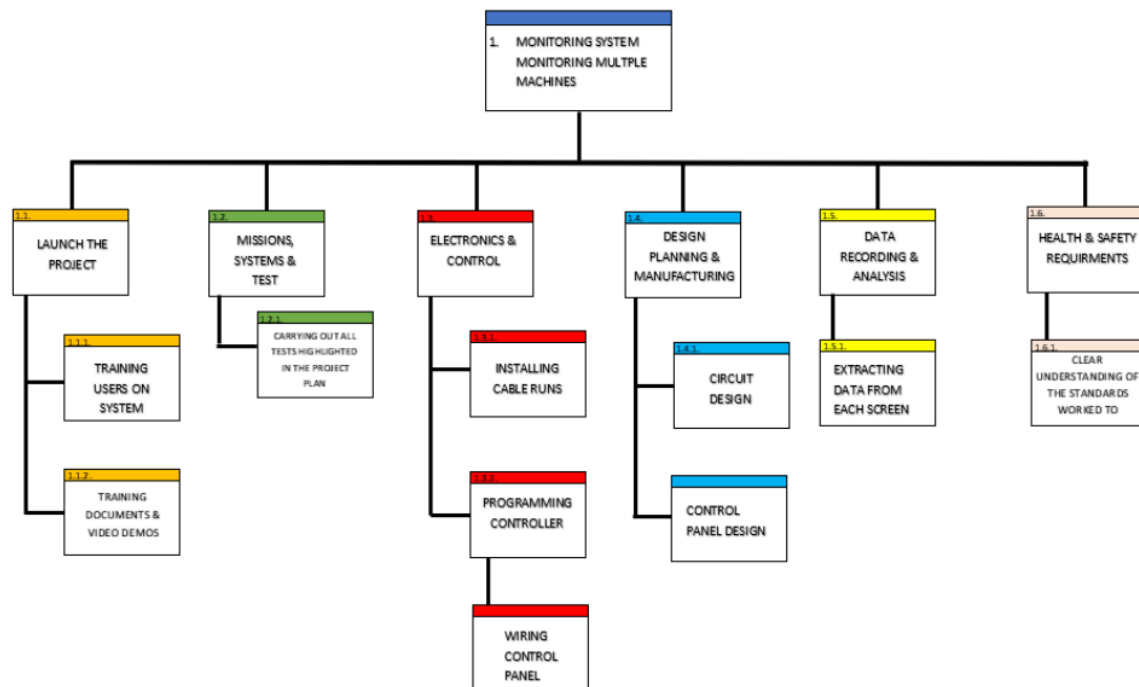


Figure 7: WBS chart

9.5. Gantt Chart

	06/01/2023 wk 1	13/01/2023 wk 2	20/01/2023 wk 3	27/01/2023 wk 4	03/02/2023 wk 5	10/02/2023 wk 6
1. MONITORING SYSTEM MONITORING MULTIPLE MACHINES	1	1	1	1	1	1
1.1. LAUNCH THE PROJECT						
1.1.1. TRAINING USERS ON SYSTEM						
1.1.2. TRAINING DOCUMENTS & VIDEO DEMO'S						
1.2. MISSIONS, SYSTEMS & TEST						
1.2.1. CARRYING OUT ALL TESTS HIGHLIGHTED IN THE PROJECT PLAN						
1.3. ELECTRONICS & CONTROL				1.3.	1.3.	1.3.
1.3.1. INSTALLING CABLE RUNS				1.3.1.	1.3.1.	1.3.1.
1.3.2. PROGRAMMING CONTROLLER						
1.3.3. WIRING CONTROL PANEL						
1.4. DESIGN PLANNING & MANUFACTURING	1.4.	1.4.	1.4.	1.4.	1.4.	1.4.
1.4.1. CIRCUIT DESIGN	1.4.1.	1.4.1.	1.4.1.			
1.4.2. RESEARCHING SIEMENS LOGO DATA	1.4.2.	1.4.2.	1.4.2.	1.4.2.	1.4.2.	1.4.2.
1.4.3. CONTROL PANEL DESIGN			1.4.3.	1.4.3.	1.4.3.	
1.5. DATA RECORDING & ANALYSIS						
1.5.1. EXTRACTING DATA FROM THE HMI COUNTERS						
1.6. HEALTH & SAFETY REQUIREMENTS	1.6.	1.6.	extra week			
1.6.1. CLEAR UNDERSTANDING OF STANDARDS WOKRED TO	1.6.1.	1.6.1.				

17/02/2023 wk 7	24/02/2023 wk 8	03/03/2023 wk 9	10/03/2023 wk 10	17/03/2023 wk 11	24/03/2023 wk 12	31/03/2023 wk 13	07/04/2023 wk 14	14/04/2023 wk 15	21/04/2023 wk 16	28/04/2023 wk 17
1	1	1	1	1	1	1	1	1	1	1
							1.1	1.1	1.1	extra week
							1.1.1.			
								1.1.2.	1.1.2.	
					1.2	1.2	extra week			
					1.2.1.	1.2.1.				
1.3	1.3	1.3	1.3	1.3						
1.3.2.	1.3.2.									
		1.3.3.	1.3.3.	1.3.3.						
1.4	1.4	1.4	1.4	1.4						
1.4.2.	1.4.2.	1.4.2.	1.4.2.	1.4.2.						
							extra week	1.5.	1.5.	
								1.5.1.	1.5.1.	

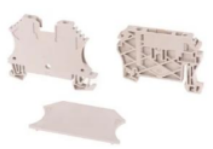
Figure 8: Gantt chart for the following 3 months

Presenting pictures of each item is unnecessary here but could have been placed in the log-book

9.6. Costing Spreadsheet *A spreadsheet should contain numbers and totals only*

Description	Option 1	Description	Option 2	Description	Option 3
Siemens LOGO! 230 RCE 	£114.75	Siemens LOGO! 230 RCE 	£114.75	Mitsubishi PLC 	£33.20
SIMATIC Basic Panel Siemens KTP700 Basic 	£572.67	Dell SE2422H Full HD Monitor, 24" 	£120	DELTA - DOP-103WQ 	£156
Unmanaged Ethernet Switch TERZ NITE-RF5-1100 	£57.60	Unmanaged Ethernet Switch TERZ NITE-RF5-1100 	£57.60	Unmanaged Ethernet Switch TERZ NITE-RF5-1100 	£57.60
Siemens SIMATIC NET 6XV1850-2GE5 	£10.80	Siemens SIMATIC NET 6XV1850-2GE5 	£10.80	Siemens SIMATIC NET 6XV1850-2GE5 	£10.80

Siemens LOGO! Soft Comfort V8 	£43.38	Siemens LOGO! Soft Comfort V8 	£43.38	GX Developer software 	£31.20
Siemens SIMATIC WinCC Basic V17 	£96.39	Klaxon Sonos Series Red Sounder Beacon 	£69.17		£14.49
Single core & Multicore sy cable 	£200	Single core & Multicore sy cable 	£200	Single core & Multicore sy cable 	£200
RS PRO ABS Wall Box, IP65, 400 mm x 300 mm x 165mm 	£74.68	RS PRO Steel Wall Box, IP66, 300 mm x 300 mm x 210mm 	£58.86	RS PRO Steel Wall Box, IP66, 300 mm x 300 mm x 210mm 	£58.86
RS PRO Steel Slotted DIN Rail, Top Hat		RS PRO Steel Slotted DIN Rail, Top Hat		RS PRO Steel Slotted DIN Rail, Top Hat	

Compatible, 2m x 35mm x 7.5mm 	£7.97	Compatible, 2m x 35mm x 7.5mm 	£7.97	Compatible, 2m x 35mm x 7.5mm 	£7.97
Weidmuller WDU DIN Rail Terminal Block, 2.5mm ² , 800 V 	£12.78	Weidmuller WDU DIN Rail Terminal Block, 2.5mm ² , 800 V 	£12.78	Weidmuller WDU DIN Rail Terminal Block, 2.5mm ² , 800 V 	£12.78
RS PRO Green, Yellow Earth Terminal Block, Single level 	£3.03	RS PRO Green, Yellow Earth Terminal Block, Single level 	£3.03	RS PRO Green, Yellow Earth Terminal Block, Single level 	£3.03
Eaton, 2P Rotary Switch, 25A 	£10.42	Eaton, 2P Rotary Switch, 25A 	£10.42	Eaton, 2P Rotary Switch, 25A 	£10.42
Stainless Steel Cable Gland Kit, M25 Thread, 13.5mm Min, £94.56	£94.56	Stainless Steel Cable Gland Kit, M25 Thread, 13.5mm Min, £94.56	£94.56	Stainless Steel Cable Gland Kit, M25 Thread, 13.5mm Min, £94.56	£94.56

20mm Max, IP66, IP68 		20mm Max, IP66, IP68 		20mm Max, IP66, IP68 	
ABB Metallic Nickel-Plated Brass Cable Gland, M25 Thread, 17mm Min, 20mm Max, IP68  £7.31		ABB Metallic Nickel-Plated Brass Cable Gland, M25 Thread, 17mm Min, 20mm Max, IP68  £7.31		ABB Metallic Nickel-Plated Brass Cable Gland, M25 Thread, 17mm Min, 20mm Max, IP68  £7.31	
Total cost Option 1	£1306.34	Total cost Option 2	£810.63	Total cost Option 3	£698.22

Table 4: Cost sheet for all 3 options with grand totals

9.7. Log entries up the present time

Log Number	1
Date	30/09/22
Duration (hrs)	7
Accumulated time (hrs)	7

Record of activities and achievements

22nd SEPTEMBER 2022

- After a discussion with my shift manager, we concluded that improving the efficiency of the line was the more important option and I would get much more backing with this idea. Although after a recent incident with the safety of the machine, concerns have been raised to improve the safety also, so some simple small ideas have been brought up for this.

Time spent on 22/09/2022: 1 hour

23rd SEPTEMBER 2022

- I attended college with a couple of ideas which I wanted to use for my project. I would either go down the safety route which involved making safety modifications to our glass bottle line filling system or improve the efficiency of the production line overall.

Time spent on 23/09/2022: 1 hour

25th SEPTEMBER 2022

- I took photos of each machine ready to place inside a document to create a floor plan of where I will be placing my modifications.
- I started to create more solid ideas as to what I wanted to improve the efficiency of the line and the safety of the filler station.

Time spent on 25/09/2022: 2 hours

29th SEPTEMBER 2022

- I created a project proposal to present my conclusion of what I wanted to achieve for my project. I haven't yet had this signed off by my shift manager which includes a summary of what I must achieve and the budget of the project.

Time spent on 25/09/2022: 2 hours

30th SEPTEMBER 2022

- I created an excel document which will track each week what task I will be carrying out. This has been put in place to help me stay on track with tasks and to avoid later complications.

Time spent on 25/09/2022: 1 hour

Plans for next week

I will concentrate on continuing my research into the design of my circuits for my system and how I can integrate into other machines. I'll also make sure I understand what I want, and I can start ordering materials ready so that I can avoid any long lead times. I will create another logbook on my weekly progress from the 30th to the 7th.

Signed _____

Signed _____

Figure 9: Logbook entry no.1

Log Number	2
Date	07/10/22
Duration (hrs)	7
Accumulated time (hrs)	14

Record of activities and achievements

30th SEPTEMBER 2022

- Spent my time in college assessing what information I needed to gather next
- Started to build more detailed Gantt charts for me to follow and time manage better. Found it useful to take advantage of the documents which were located on google classroom.

Time spent on 30/09/2022: 4 hours

02nd OCTOBER 2022

- Spent time throughout the day asking the line 2 lead about data kept for Line 2 performance over the last couple of months.
- Tasked myself to gather all this information first to give me the best idea as to where the majority of the time was lost on the line and the best way to improve it.

Time spent on 02/10/2022: 3 hours

03rd OCTOBER 2022

- Reviewed my latest logbook "plan for next week" comments. Now being at this stage I've realised that I'm not yet ready to carry out any drawings yet and instead feel that I need to focus on gathering as much data as possible at these earlier stages.

Plans for next week

I will look to compile all my data together and mould it into different data charts which I will then present to my manager.

Signed _____

Signed _____

Figure 10: Logbook entry no.2

Log Number	3
Date	14/10/22
Duration (hrs)	9
Accumulated time (hrs)	23

Record of activities and achievements

07th OCTOBER 2022

- Continued to put more detail into my gantt chart whilst trying to adapt to the challenges I've experienced every day.

Time spent on 07/10/2022: 2 hours

10th – 14th OCTOBER 2022

- Spent the majority of my time learning and understanding the line.
- Studied the line and logged downtime on each day. This gave me a gauge as to how much down time I was looking at.

Time spent on 10/10/2022 – 14/10/2022: 7 hours

Plans for next week

To prepare a series of documents together like my project gantt chart and development ideas ready to present to a team of nestle visitors attending site next week. I will continue to record daily data on the line which involves stock produced / downtime and problems occurred on the line.

Signed _____

Signed _____

Figure 11: Logbook entry no. 3

Log Number	4
Date	22/10/22
Duration (hrs)	15
Accumulated time (hrs)	38

Record of activities and achievements

15th OCTOBER 2022

- This was my college day in which I focussed on putting together a first draft version for task 4 in the report, Project Background & Problem Definition & Constraints. By the end of the college day, I had a first draft ready. I was then waiting for feedback on this.

Time spent on 07/10/2022: 4 hours

17th – 19th OCTOBER 2022

- Due to only having one operator available to run line 2 I stepped in to help assist with any running issues on the line. This gave me a broad perspective of how many problems we're really faced with. I found this useful as it gave me ideas to implement into my project.

Time spent on 17/10/2022: 8 hours

20th OCTOBER 2022

- Today I spent my time looking at the long lead items that I had to purchase. I didn't predict doing this this early, however, due to very long lead times now I become worried that I wouldn't get the parts I needed in time.

I was right to look like the parts I was looking for on some websites had massive lead times which wouldn't suit my timeline at all.

I eventually came to RS components after looking for some time and found the same parts but on back order for dispatch on the 27th of October. The items on this site were about £100 more expensive but I bit the bullet and continued.

The parts I wanted consisted of a PLC starter kit. Inside were a PLC 1200 Siemens with a 6" HMI and the software to program.

Automation & Control Gear > PLCs, HMI & Industrial Computing > PLCs - Programmable Logic Controllers

Siemens, S7-1200, PLC CPU Starter Kit - 10 Inputs, 6 Outputs, For Use With CPU, Profinet Networking, Ethernet Interface

RS Stock No.: 201-1769 | Mfr. Part No.: 6AV6651-7HA02-0AA0 | Brand: Siemens



Available to back order for despatch 26/10/2022

inc 1 + Units [Back order](#)

Price Each	
£547.00	£656.40
(inc. VAT)	(inc. VAT)

Units	Per unit
1 +	£547.00

[View this content](#)

Time spent on 20/10/2022 3 hours

Plans for next week

To further purchase any long lead parts and start refreshing my memory on learning how to program the PLC. To back this I'll finalise what ideas I have for line 2 in a word document.

Signed _____

Signed _____

Figure 12: Logbook entry no. 4

Log Number	5
Date	23/10/22 - 28/10/22
Duration (hrs)	9
Accumulated time (hrs)	47

Record of activities and achievements
<u>23rd OCTOBER 2022</u> - I have since been working on my second draft for task 4. Time spent on 23/10/2022: 4 hours <u>27th OCTOBER 2022</u> - I started working on Task 5, the first draft ready for marking. - I found out that my PLC kit will be delayed. It was due to be dispatched today however it has been extended till the 5th of November. Time spent on 20/10/2022 5 hours

Plans for next week
To further purchase any long lead parts and start refreshing my memory on learning how to program the PLC. To back this, I'll finalise what ideas I have for line 2 in a word document. I will have hopefully had feedback on my task 4 ready to sign off and if not then I'll work on a third draft. I'm also hoping to be working on my task 5 second draft.

Signed _____

Signed _____

Figure 13: Logbook entry no. 5

Log Number	6
Date	29/10/22 - 04/11/22
Duration (hrs)	20
Accumulated time (hrs)	67

Record of activities and achievements
<u>31st OCTOBER 2022</u> - I booked overtime hoping to achieve more work on my project but soon discovered that the entirety of line 2 was down due to a capping station issue. - 1 out of the 4 capping heads had snapped and was beyond repair so I spent the day dismantling the head and also removing a good head due to a lack of drawings. Time spent on 31/10/2022: 10 hours <u>1st OCTOBER 2022</u> - Spent the day cleaning the 2 heads that I took off and requesting for a company to come and collect the damaged heads ready to reproduce the parts. - The company who made the machine is based in Italy and their lead times are extremely long. - I also cleaned the entire machine ready for re-greasing. Time spent on 01/11/2022 10 hours
Plans for next week To further purchase any long lead parts and start refreshing my memory on learning how to program the PLC, I set this target for last week but didn't complete it so I will continue this through the week. To back this, I'll finalise what ideas I have for line 2 in a word document. I have since completed rework on task 4 and have completed a first draft on task 5 but I am currently working on the second draft.

Signed _____

Signed _____

Figure 14: Logbook entry no. 6

Log Number	7
Date	05/11/22 - 11/11/22
Duration (hrs)	6
Accumulated time (hrs)	73

Record of activities and achievements
<u>6th OCTOBER 2022</u> - Spent time on shift creating a plan of jobs that I want to undertake for the line ready to present to Niall Bridges (operations manager) & Rhiannon Gallacher (Engineering manager). Time spent on 31/10/2022: 2 hours <u>08th OCTOBER 2022</u> - Finished tasks 4 and 5. Finalised my plan and awaiting feedback from my managers. Starting on task 7. Time spent on 31/10/2022: 4 hours
Plans for next week To further purchase any long lead parts and start refreshing my memory on learning how to program the PLC, I set this target for last week but didn't complete it so I will continue this through the week. To back this, I'll finalise what ideas I have for line 2 in a word document. Want to have a completed first draft of task 7 and a solid plan in place ready to explore more specific details like how I'm going to carry out each job.

Signed _____

Signed _____

Figure 15: Logbook entry no. 7

Log Number	8
Date	12/11/22 - 18/11/22
Duration (hrs)	8
Accumulated time (hrs)	81

Record of activities and achievements

12th OCTOBER 2022

- Came across a problem where my PLC kit that I've ordered was cancelled and discontinued. As these were my main items that I needed to order because of the long lead times I decided to make this my main priority and ordered something new straight away.
- I was out of luck ordering another kit as there is a shortage now with PLC kits due to the shortage of materials.
- One website I came across was called "Automation24" which supplies drives, plc's and all things relevant to automation.
- I came across a different PLC to what I ordered previously but stayed with the manufacturer Siemens as this is all we use in the factory and I'm most familiar with Siemens software with previous college experience.
- I left with a quotation for the following materials.

16th OCTOBER 2022

- I worked on my test plan which consisted of all the finer details that will go into my project. I broke down each task that I wanted to complete with how I would like to go about it.

18th OCTOBER 2022

- I worked on my test plan which consisted of all the finer details that will go into my project. I broke down each task that I wanted to complete with how I would like to go about it.

Plans for next week

I will have a finished task 5 consisting of a detailed table for the FSD & the test plan.

I will have approval for my automation items with payment confirmed.

I will have started task 7 which is my literature review

Signed _____

Signed _____

Figure 16: Logbook entry no. 8

Log Number	9
Date	25/11/22
Duration (hrs)	14
Accumulated time (hrs)	95

Record of activities and achievements

18th NOVEMBER 2022

- The spare parts have been received for the capper heads which I rebuilt and refitted ready to handover to the next shift.

19th NOVEMBER 2022

- I have since been working on my second draft of task 5 & 6, the Functional design Specification & the Testing Plan.
- Both including a breakdown of the tasks that I wanted to complete throughout the duration of my project and both going into different detail.

20th NOVEMBER 2022

- On this day I emailed our store's supplier to order the materials I needed for the automation side of the project. I also copied in my manager Rhiannon Gallacher to help me get this pushed through which she kindly did.

21:24

14 Messages

FW: College project materials

Good morning Steve,
I've requested materials from a company for a project I'm currently undergoing on Line 2.
I've attached a quotation which I need progressed please.
If you can kindly contact "Automation24" on "00600 24 2011 24" and ask for Arthur (He's the gent I organised this with). If for some reason he's out of office then please pass on the quotation details to whoever answers the phone to you, and if you could get this paid for me then I'd appreciate it very much.
I've attached Rhi as I have asked her for approval on this and just wanted to keep her in the loop.

Kind regards,
Mason.



Item	Description	Quantity	Unit Price	Total
1	10000	1	10000	10000
2	10000	1	10000	10000
3	10000	1	10000	10000
4	10000	1	10000	10000
5	10000	1	10000	10000

21:24

14 Messages

Re: College project materials

Ash could you raise a PO for this please?

Steve are you able to place this order or do you need me to do it?

Sent from my iPhone

On 22 Nov 2022, at 04:33, Mason Morgan <mason@princesgate.com> wrote:

Good morning Steve,
Show Quoted Content

Kind regards,
Mas.



Item	Description	Quantity	Unit Price	Total
1	10000	1	10000	10000
2	10000	1	10000	10000
3	10000	1	10000	10000
4	10000	1	10000	10000
5	10000	1	10000	10000

21st NOVEMBER 2022

- I carried out my logbook no. 9 which summarised all the project work I had completed at work and at home.

23rd NOVEMBER 2022

- I have received my SIEMENS LOGO! 8 textbooks which I have been reading to try and soak up as much knowledge as possible.

**Plans for next week**

I will continue focussing on task 7

I will be gathering the H&S points & audit which was built on the line.

I would have gained a lot more knowledge into the SIEMENS LOGO! 8

Signed _____

Signed _____

Figure 17: Logbook entry no. 9

Log Number	11
Date	09/12/22
Duration (hrs)	9
Accumulated time (hrs)	113

Record of activities and achievements

04th DECEMBER 2022

- Received delivery of my Siemens LOGO! Kit. Started by setting on a temporary rig ready for testing and programming

06th DECEMBER 2022

- Continued research into the Siemens LOGO! Programming book

08th DECEMBER 2022

- Started to draw diagrams of what screens I wanted to display on my HMI panel.
- Task 7 has almost been completed this week. I've been focussing my efforts on the 3 considered solutions with a breakdown of costs & utilising a radial graph to present to the reader the reasons why I chose the solution I did.

Plans for next week

I will continue task 7 & send for feedback.

I will be gathering the H&S points & audit which was built on the line.

Continue gaining more knowledge into the SIEMENS LOGO! 8

Signed _____

Signed _____

Figure 19: Logbook entry no. 11

Log Number	12
Date	16/12/2022
Duration (hrs)	10
Accumulated time (hrs)	123

Record of activities and achievements

11th DECEMBER 2022

- Continued to develop the rig that I wanted to set up. This will allow me to test my knowledge of the Siemens LOGO! I'll use it to test the inputs and outputs once I've created a programme. A large portion of my Gantt chart I centred around the programming and development of the PLC, so this is something I'll be developing at home & once it's ready I'll bring in work to install into its enclosure.

12th DECEMBER 2022

- I spent some time researching the Siemens LOGO! Book whilst making notes on the key points.

13th DECEMBER 2022

- I have completed Task 7 & have been spending a lot of time on Task 8. I am slightly behind where I wanted to be as far as progress is concerned for assignment 1, so I have been putting a lot of time into that to get finished.

14th DECEMBER 2022

- More work carried out on Task 8. Today I worked on completing a risk assessment.

Plans for next week

To finish Task 8 & send off for feedback.

I will be gathering the H&S points & audit which was built on the line.

Continue gaining more knowledge into the SIEMENS LOGO! 8

Signed _____

Signed _____

Figure 20: Logbook entry no. 12

LOGBOOK NUMBER: #13
TITLE: CHRISTMAS & NEW YEAR
LOGBOOK START DATE: 17/12/2022
LOGBOOK END DATE: 05/01/2023

Record of activities and achievements

- No work was carried out during this period.

Total amount spent on project development from the 17th of December – 05th December 2022.

0 hours

Plans for next week.

I will be gathering the H&S points & audit which was built on the line.

Continue gaining more knowledge into the SIEMENS LOGO! 8

SIGNED _____

SIGNED _____

Figure 21: Logbook entry no. 13

9.8. HMI display design concepts

Screen F1 – Line 2 Machine running state indication

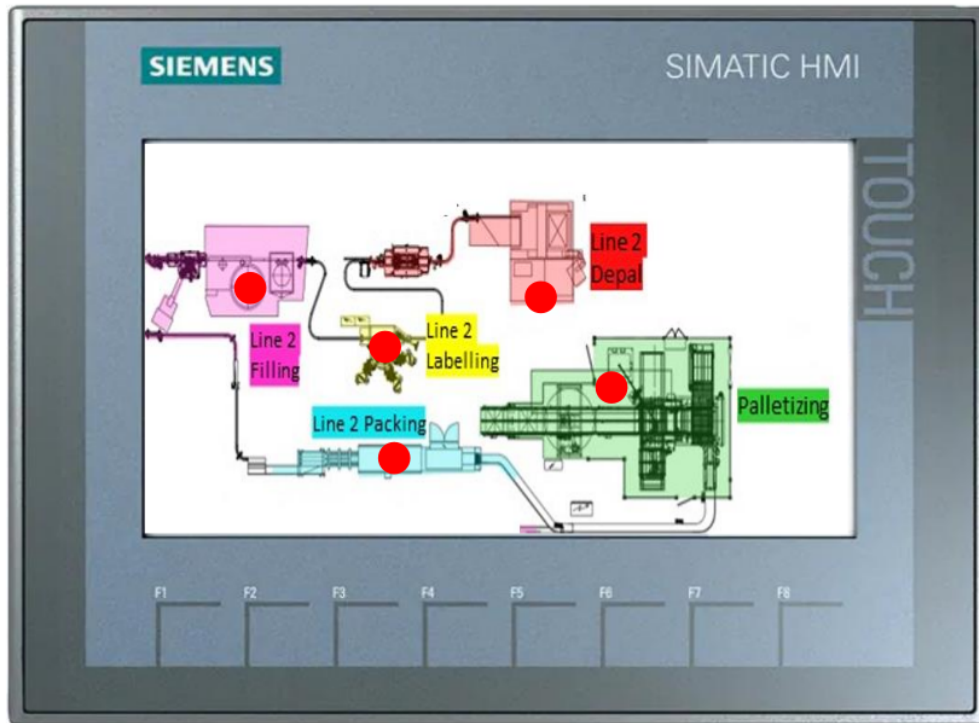


Figure 22: Prototype screen F1 (Machine active breakdown screen page)

Screen F2 – Downtime counter screen

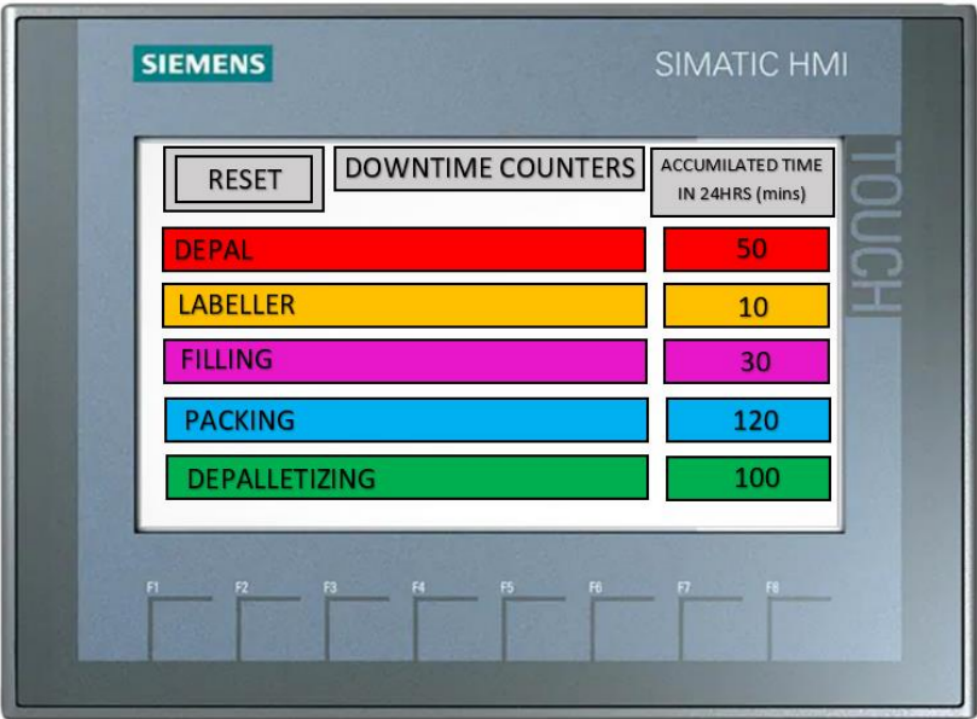


Figure 23: Prototype screen F2 (machine breakdown counter page)

FINAL GRADE

GENERAL COMMENTS

Instructor

45/100

PAGE 1

PAGE 2

PAGE 3

PAGE 4

Text Comment. You should be summarising the project not the report

Text Comment. The project proposal is not an introduction.

PAGE 5

PAGE 6

Text Comment. This is not an introduction. The proposal is in the appendix.

PAGE 7

Text Comment. unfinished sentence

Text Comment. Do you mean profit?

Text Comment. do you mean expensive?

Text Comment. protocol is a way of communicating between people or devices.

PAGE 8

Text Comment. This section reads like part problem definition and part FDS

Text Comment. Is this really a source for this information?

Text Comment. This section reads like an FDS

Text Comment. Is this really a source for this information?

PAGE 9

Text Comment. This can't be a source for this information. You should have researched legal or commercial standards relevant to your project.

PAGE 10

QM

Use the third Person

You are referring to first or second persons (I, we, you, us etc) whereas you should use the third person thus depersonalising it.

Text Comment. You don't need to give a running commentary on why you are writing this section. Do not write in the first person as it is unprofessional.

PAGE 11

PAGE 12

PAGE 13

PAGE 14

PAGE 15

Text Comment. unnecessary words

QM

Use the third Person

You are referring to first or second persons (I, we, you, us etc) whereas you should use the third person thus depersonalising it.

PAGE 16

QM

Use the third Person

You are referring to first or second persons (I, we, you, us etc) whereas you should use the third person thus depersonalising it.

QM

Use the third Person

You are referring to first or second persons (I, we, you, us etc) whereas you should use the third person thus depersonalising it.

Text Comment. How can this source be the basis of the above sentence?

QM

Use the third Person

You are referring to first or second persons (I, we, you, us etc) whereas you should use the third person thus depersonalising it.

Text Comment. What did George Brown say about it?

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

QM

Punctuation Error

Punctuation error

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

PAGE 17

PAGE 18

Text Comment. Not a credible source

PAGE 19

Text Comment. How do you justify your choice of solution from this table?

Text Comment. What is your scoring system?

PAGE 20

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

QM

Write in the third person

Don't refer to your self as I, me, my or others as you etc. Avoid personal references. If absolutely necessary, refer to self as "the author".

PAGE 21

Text Comment. You should have made references to your Work Breakdown Structure and Project plan in the appendix

PAGE 22

Text Comment. You should have introduced the report at that point.

Text Comment. which solution was chosen?

Text Comment. Poor justification of final choice

Text Comment. No references to WBS or Gantt chart in main report although they are in the appendix

Text Comment. This section contains a summary of report content and is not a conclusion. What are your recommendations?

PAGE 23

PAGE 24

PAGE 25

PAGE 26

PAGE 27

Text Comment. Where is the scoring table from which this diagram was produced?

PAGE 28

PAGE 29

PAGE 30

PAGE 31

Text Comment. Presenting pictures of each item is unnecessary here but could have been placed in the log-book

Text Comment. A spreadsheet should contain numbers and totals only

PAGE 32

PAGE 33

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GRADING FORM: NEW CSG-RUBRIC

MASON MORGAN**45****1. ENGAGEMENT WITH LITERATURE**

Sections 3 and 5: Engagement in research, judicial use and critical evaluation sources for project constraints and literature review of solutions The report contains evidence of reading (5/10) Sections 3, 5 and 8: Extent of reading, use of credible sources, use of Harvard method for listing and citing Correct method of citing and listing used but not all sources are relevant to location of citation in the text. (4/10) Total = 9/20

9**2. KNOWLEDGE AND UNDERSTANDING**

Section 3: Project background and problem definition Briefly stated with some explanation (3/5) Section 3: Project constraints: Ethical. This section reads like an FDS. No standards have been cited. (0/5) Section 3: Project constraints: Sustainability This section reads like an FDS. No standards have been cited. (0/5) Section 3: Project constraints: Legal/Commercial This section reads

3

like an FDS. No standards have been cited. (0/5)

Total = 3/20

3. COGNITIVE AND INTELLECTUAL

 Section 4: Functional Design Specification The FDS contain 7 points that will act as measurable outcomes (3/5) Section 4: Test planning Testing table contains ample tests to check for success of the project. (3/5) Section 5: Evaluation of solutions and justification of final solution Some evaluation but poor justification of final solution. Radar diagram in the appendix has no scoring matrix to base it on. (2/5) Section 7: Conclusions and Recommendations This section contains a summary of report content. No recommendations offered? (1/5) Total = 9/20

9

4. PRACTICAL APPLICATION

 Section 6: Project Plan A reasonable plan is contained in the appendix but no references made to it in the main report. (3/6) Section 6: Working breakdown structure, costing exercise and management techniques. A reasonable WBS is contained in the appendix but no references made to it in the main report. Evidence of costing and management techniques included. (3/6) Appendix: Risk assessment for implementation phase Brief risk assessment included (2/6) Appendix: Planning phase log-book entries. Good evidence of working in log entries (4/5) Total = 12/20

12

5. TRANSFERABLE SKILLS



Section 1: Executive summary This describes the contents of the report and is not a summary of the project. (1/5) All Sections: Presentation quality of the report, diagrams, charts, tables, figure numbering, page, and section numbering etc Good presentation etc. (4/5) All Sections: Quality of the writing style, use of punctuation and grammar Mostly good grammar and some punctuation. However, you must learn how to write in the third person. Constant references to "I", "me" and "mine" are inappropriate at this level. (2/5) Word count limit not exceeded Not exceeded (5/5) Total = 12/20