

# 1503517

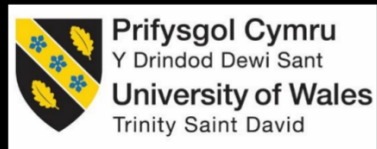
*by* Kristian Payne

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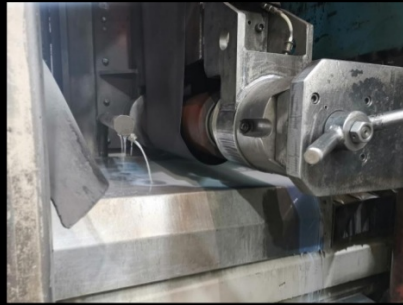
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| TIME SUBMITTED | 19-DEC-2019 09:51PM (UTC+0000)                            | WORD COUNT      | 194  |
| SUBMISSION ID  | 116895672                                                 | CHARACTER COUNT | 1268 |

# SGE 6003- Presentation 1 : Project Definition, Research and Quality Planning

Kristian Payne



# Project Background



## Problem Definition & Constraints

- Outdated unsuitable parts
- Potential for Undetected loss of vacuum
- Difference in Vacuum pressure between chuck and switch
- Potential for dangerous occurrence

# Functional Design Specification

- Vacuum interlock sensor relocation
- Vacuum alarm
- Operator visual feedback
- Manual test functionality
- Reduced maintenance costs
- Increased safety
- Budget of £3000

## Project Risks

- Resistance to change
- Project planning
- Budget overrun
- Design failure

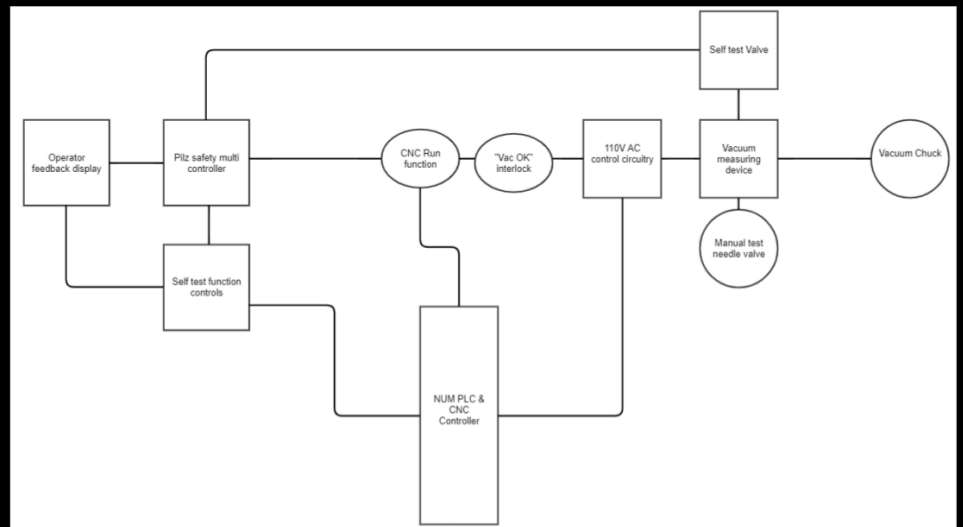
# Test planning

1. Machine power up
2. Switches, sensors and indicators
3. Machine status
4. External connections
5. Operator controls
6. Interlocks
7. Vacuum supply and measurement
8. Vacuum pump
9. Maintenance inspection
10. System feedback
11. Functional program test

# Solution review

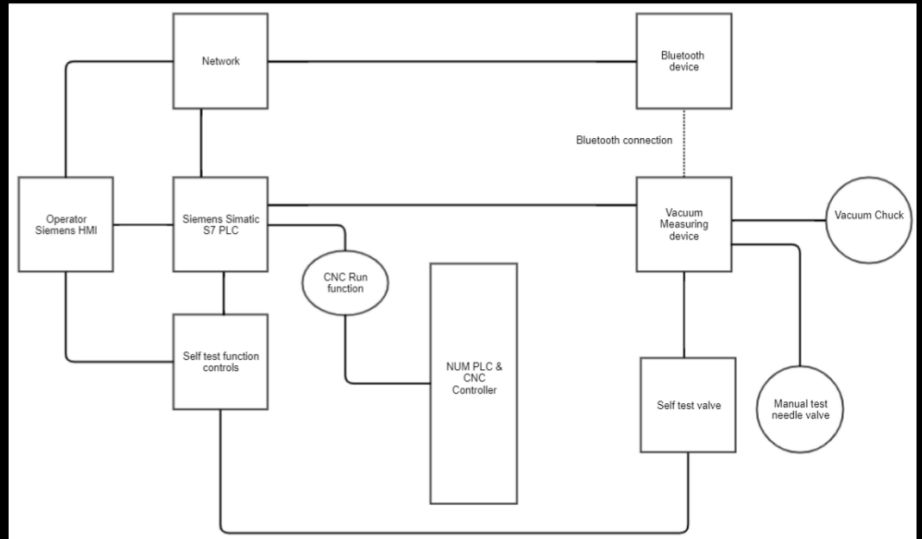
# Solution 1

- Pilz Safety controller
- Improved operator feedback
- Maintain PLC/CNC controller
- Automatic self test function



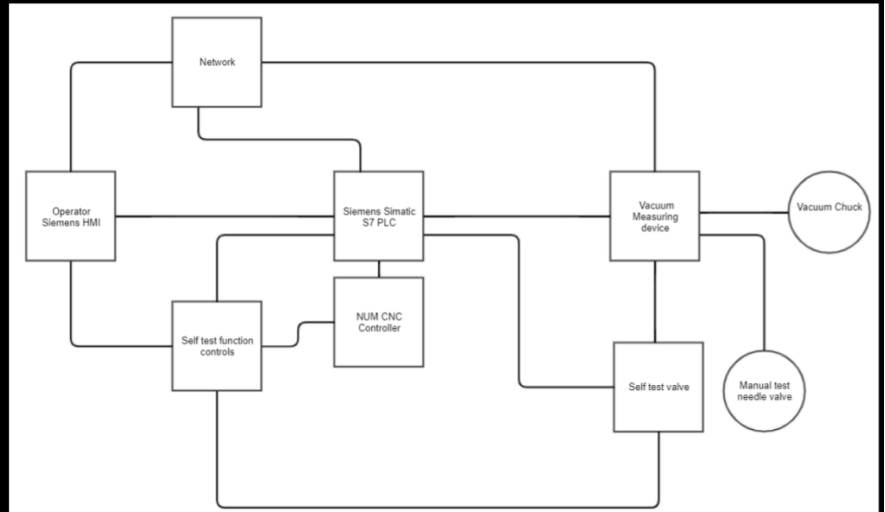
## Solution 2

- Siemens S7 PLC
- Siemens HMI feedback
- Maintain PLC/CNC controller
- Automatic self test function
- Networked
- Bluetooth device integration



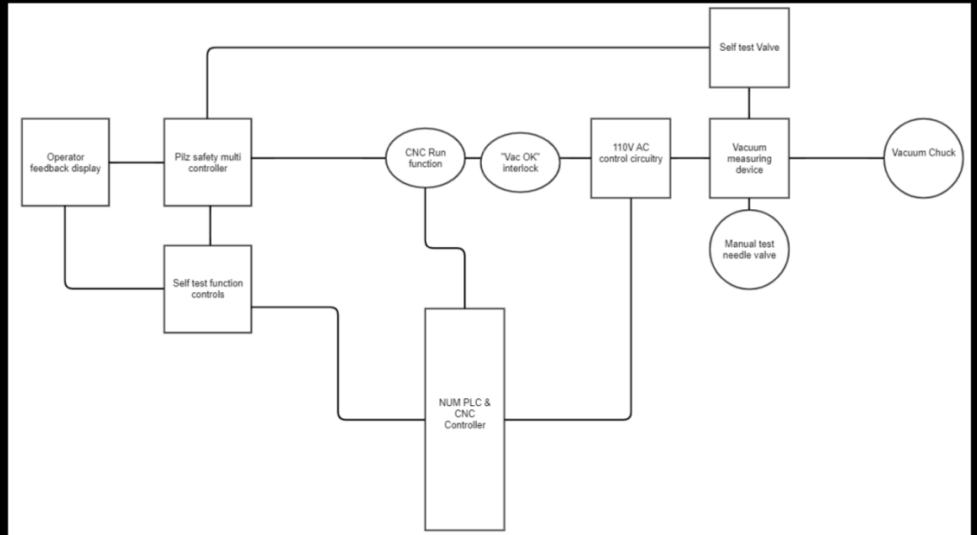
## Solution 3

- Replacement of NUM PLC
- Siemens S7 PLC machine control
- Siemens HMI feedback
- Automatic self test function
- Networked



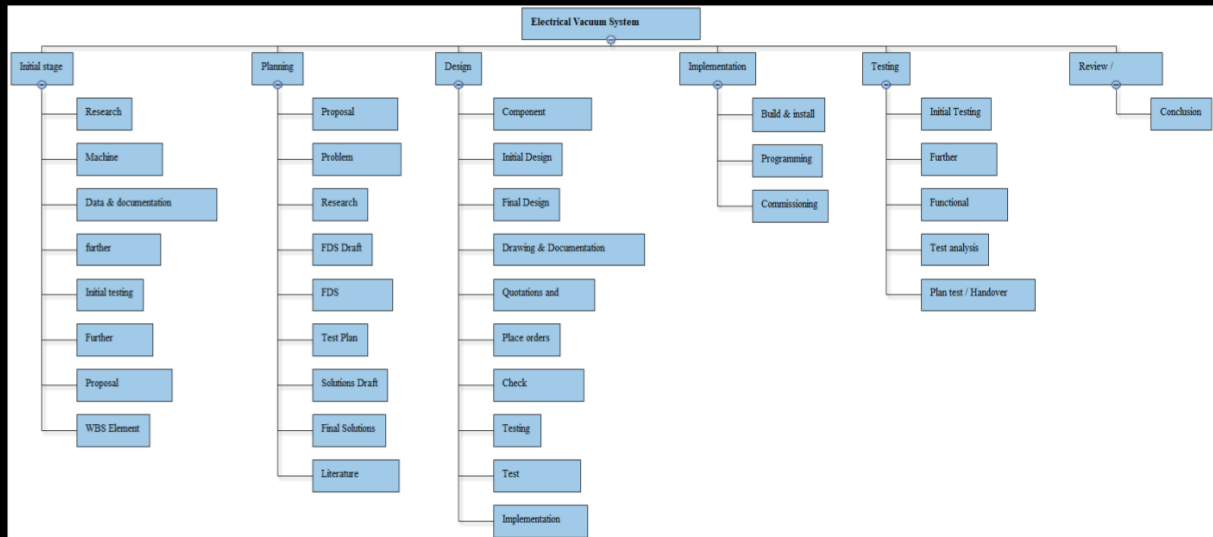
# Selected: Solution one

- Lowest cost
- Lowest installation time
- Enhanced safety functionality
- Ease of integration
- Maintains manual test functionality

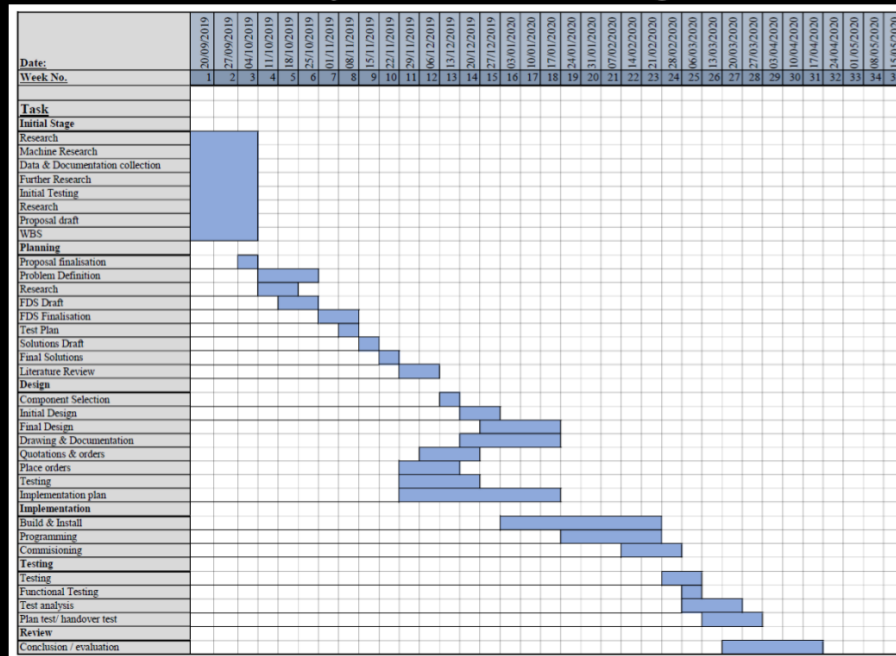


# Work breakdown structure and project planning

# Work breakdown structure



# Project Planning



## Progress made to date.

- Initial tests with vacuum measurement prototype carried out



FINAL GRADE

GENERAL COMMENTS

**57** /100**Instructor**

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GRADING FORM: NEW CSG-RUBRIC

**KRISTIAN  
PAYNE****57****1. ENGAGEMENT WITH LITERATURE**

Engagement in research, for project background (/5) Company document referred to including accident report and supplier information. Very limited reference to research. (3/5) Engagement in research, for review of solutions (/5) Some evidence given. Limited sources used. (2/5) Total = 5/10

**5****2. KNOWLEDGE AND UNDERSTANDING**

Project background (/5) Very good description given. Dangerous occurrence on a CNC grinding machine involving ejection of plate metal due to an undetected loss of vacuum. (4/5) Project risks, health and safety etc (/5) Risk given around making the machine safer but no project risk planning given. Main risks to the project were from company management pulling the project from him. (4/5) Response to questions 1, 4, 7 and 8 (/10) Little understanding of the wider issues. Some good answers, but vague on the

**12**

specifics of several questions. (4/10) Total = 12/20

### 3. COGNITIVE AND INTELLECTUAL

-  Problem Definition and constraints (/10) Some explanation given. Problem solution is to install a vacuum interlock and sensor alarm if vacuum is lost. (6/10) Functional Design Specification (/10) Good but no measurables given. FDS was explained, however this lacked some detail on specifics that would have been expected at this stage. E.g sourcing of some major components. Budget of £3000 was mentioned. (5/10) Test planning (/10) Detailed list with good explanation. 12 stage test plan included, this lacked clarity on some tests, e.g. "operator controls should operate as intended". (6/10) Response to questions 2 and 6 (/5) Little understanding of the wider issues. A little vague on some responses suggests that progress is behind schedule. (3/5) Total = 20/35
- 20**

### 4. PRACTICAL APPLICATION

-  Critical choice and justification of final solution (/10) Good choices presented and justification given. 3 solutions given and comprehensive grading of each was explained, justification for final choice was mentioned. (5/10) Project Planning and working breakdown structure (/10) Good evidence presented. Gantt chart and WBS used as planning tools. (6/10) Response to questions 3 and 5 (/5) Little understanding of the wider issues. Good answers to these questions. (2/5) Total = 13/25
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### 5. TRANSFERABLE SKILLS

-  Quality of the presentation slides – (/5) Very good All slides were clear and readable. (4/5) Quality of the delivery style – (/5) Good style and good time keeping Confident and fluid, presentation was well-timed. (3/5) Total = 7/10
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