

Final Presentation

by Emyr Dyer

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Automation Browser Application - Project Presentation 2

Emyr Wyn Dyer

Content

- The FDS and what changed
- The Design implemented
- The Construction
- Testing of the Solution
- Evaluation of the Solution
- Review of project Management
- Overall Conclusions

Aims and Objectives

- To produce a means of observing and controlling a system remotely
- Using the underutilised Webserver feature
- Utilise a Memory Card to avoid performance issues

The FDS for the ABA

Original FDS

- Hosted on the S7 PLC controlling CIM System
- Support Google Chrome
- Response, No Flicker
- Similar controllability to HMI
- Standalone LAN
- Password Protection

Changes made

- Developed and operated on separate system.
- No implementation of Password Protection (Existing Feature)

Design

Elements

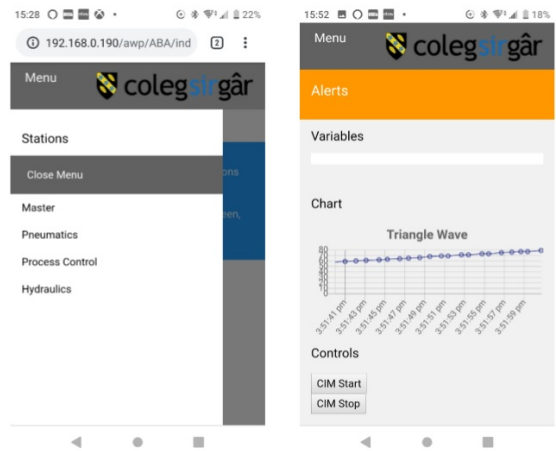
- Webpages as Control Screens
- HTML, CSS, JavaScript (jQuery), AJAX, and JSON

Resources

- Siemens S7 User Manual
- Web-Design literature by O'Reilly Media
- W3Schools
- Chart.js Online Documentation

Construction

```
1 <!-- AwP_In_Variable Name="PLC_102 PUT counter".CV' -->
2 <!-- AwP_In_Variable Name="HMI CIM Start" -->
3 <!-- AwP_In_Variable Name="CIM Run" -->
4
5 <!DOCTYPE html>
6
7 <html lang="en">
8   <head>
9
10      <!-- System Information -->
11      <div class="w3-container">
12        <h5>Variables</h5>
13        <table class="w3-table w3-striped w3-white">
14          <tr>
15            <td>HMI CIM Start</td>
16          </tr>
17          <tr>
18            <td id="cim_start">2</td>
19          </tr>
20        </table>
21      </div>
22
23      <script>
24        { "start_state" : "HMI CIM Start": "" }
25      </script>
26    </head>
27  </html>
```



Testing

Criteria

- Operation
- Response Time
- CIM element representation
- Accuracy of Values
- Security Strength
- Operating Failures

Results

- All pages loaded
- Delay between on-page variables and watchtable minimal and accurate
- Vague facimily of CIM Stations
- LAN isolated
- No Failures, but no test on CIM

Testing Analysis

- Representing PLC variables as values and graphics was successful
- Transitioning between 'CIM System' elements viable
- Network Secure through use of LAN and Password Protected WiFi
- Reliable on Google Chrome
- CIM System controllability untested.

Evaluation

Successes

- Produced Webpages that represented PLC variables
- Consistent Operation in a Web Browser (Desktop, Mobile)

Shortcomings

- No testing on the CIM System itself
- No application of User Profiles

Management Review

[illegible]

Conclusions and Recommendations

Conclusions

- To complete the project, knowledge of PLC Programming and Web Development were instrumental
- The technologies and techniques used were viable

Recomendations

- Improve the mimicry of the CIM System in a remote working environment.
- Add error logging and downloading of data from pages
- Expand selection of gauges to present data

Final Presentation

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

61 /100

Instructor

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GRADING FORM: NEW CSG-RUBRIC

EMYR
DYER

61

1. ENGAGEMENT WITH LITERATURE

-  Use of technical literature in final design solution: Sources were listed in the presentation slides and explained. Project required extensive use of Siemens S7 user manual, W3Schools and JSON online documentation explaining how to implement JavaScript modules. (4/5) **4**

2. KNOWLEDGE AND UNDERSTANDING

-  Introduction: Good reminder of the project aims and outcomes. Introduction with project aims and objections started off the presentation. (4/5) Brief review of the specified outcomes of the FDS. This was discussed which covered the original FDS and introduced 2 changes that were made – it was to be developed on a separate system and the password protection feature was to be removed. (4/5) Advanced knowledge and critical understanding demonstrated in the design of the project: Good evidence of advanced knowledge in the development of the ABA solution with use of high-level software skills. Highly technical project relying on extensive knowledge of HTML, JavaScript and JSON, as well as Siemens PLC. (7/10) Response to questioning: Responses were adequate but not instantly forthcoming. Needed a lot of prompting. Response to some questions was a bit vague and it took a bit of prompting to get an answer. Answers to some of the wider issues had not been prepared in advance. (4/10) **19/30** **19**

3. COGNITIVE AND INTELLECTUAL

-  Testing and analysis of result: Some evidence presented but could have been more thorough in explanations. Testing was explained through 2 bulleted lists covering “Test Criteria” and “Results”. A brief explanation of each was given. It was explained that testing was limited due to Covid-19 lockdown. (5/10) Critical evaluation of the project outcomes and comparison with the FDS: A good evaluation of the FDS compared with the outcomes produced. Evaluation was very limited due to a lack of testing during lockdown. (5/10) Overall conclusions and recommendations: Good consideration given of the overall project outcome and future developments. Recommendations to improve the mimicry of the CIM system, add error logging and to expand the selection of gauges. (7/10) Total = 17/30
- 17**

4. PRACTICAL APPLICATION

-  Formulation of innovative and creative design solution: Solution is innovative, creative and professional as expected for an industrial application. A brief overview of the design of the code was given, a full flow chart may have been more useful. (3/5) Deployment method, use of material, tools, equipment and techniques in the construction of the project: Good use of professional software for webserver and TIA Portal for PLC program. Project was primarily implemented in software and downloaded to the college CIM system for testing, no physical artifact was produced. (3/5) Quality : The product shows no flicker and is suitable as an industrial application though a CIM conveyor mimic was not completed. (4/5) Use of test equipment and presentation of results of the project: Some evidence of testing with results from the PLC program using watch table with TIA Portal. (3/5) Management techniques and planning, comparison with initial plan: Some evidence given. (2/5) Total = 15/25
- 15**

5. TRANSFERABLE SKILLS

-  Quality of the presentation slides: Good quality overall. Slides were readable and of reasonable quality. (3/5) Quality of the delivery style: Style is satisfactory, presentation overran by 1 minute. Webcasting aside, the presentation was a little disjointed and under rehearsed. (3/5) Total = 6/10
- 6**