Project Manual

Project: PLCopen-Editor

Course:	Software Engineering
Class:	Tinf19C
Professor:	Christian Holder, Markus Rentschler
Project manager:	Mouaz Tabboush
Team members:	Elian Yildirim Franziska Kopp Leonie de Santis
Version:	PHB 1.0, November 2020

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1. Table of revision

Version	Date	Comment	Author
0.1	02.11.2020	Created Project assignment und Project organization	Leonie de Santis
0.2	03.11.2020	Work breakdown structure	Mouaz Tabboush
0.3	03.11.2020	Project context, Project Objectives Plan, WP-Description, Milestone plan, Gantt chart, Project risks	Leonie de Santis

2. Project assignment

<table>
<tr><th colspan="2">Project assignment</th></tr>
<tr><td>Project objective (Output):
Development of an editor GUI, which supports the PLC programming languages FBD (Function Block Diagram) and SFC (Sequential Function Chart). The common logic blocks should be available as graphical library elements and should be able to be dragged into the editor window and connected with each other.
It should be possible to save and load the PLC programs as PLCopen or AML.</td><td>Non-objectives / Non-contents:
The PLC programming languages LAD, IL and ST need not be supported
The verification of the function of an example program on a runtime system was taken from the requirements and is optional..</td></tr>
<tr><td colspan="2">Project benefits (Outcome):
With the PLCopen-Editor GUI graphical PLC programs can be created. The languages FBD and SFC as well as the common logic blocks are available for this purpose. The programs can be saved or loaded as PLCopen XML or AML files.
The exported file can be imported and loaded in other development environments (e.g. AML editor).</td></tr>
<tr><td>Project client: C. Holder; M. Rentschler</td><td>Project manager: Mouaz Tabboush</td></tr>
<tr><td>Team members:
Elian Yildirim
Franziska Kopp
Leonie de Santis</td><td>Other defendants:</td></tr>
<tr><td>Main tasks:
Documentation
Analysis
Design
Coding
Testing</td><td>Milestones:
Analysis- / Design-Phase
Coding-Phase
Testing-Phase
Project completion</td></tr>
<tr><td>Start of project: Introductory lecture and project awarding</td><td>Start date: 11.09.2020</td></tr>
<tr><td>End of project: Presentation of the result</td><td>End date: Mai 2021</td></tr>
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3. Project Objectives Plan

Objective type	Project objectives
Project objective (Output):	Development of an editor GUI, which supports the PLC programming languages FBD (Function Block Diagram) and SFC (Sequential Function Chart). The common logic blocks should be available as graphical library elements and should be able to be dragged into the editor window and connected with each other. It should be possible to save and load the PLC programs as PLCopen or AML.
Sub-objectives:	Design: • Workflow • Editor GUI • Import/Export Coding: • Homepage • Editor window • Programming languages: FBD, SFC • FBs that are dragged into the editor window and connected • Import/Export Testing: • Error Detecting • GUI Testing • Export Testing • Side effects (Delete, Move, …) • Components (Function Blocks, Connectors, Variables)
Non-objectives / Non-contents:	• The PLC programming languages LAD, IL and ST need not be supported • The verification of the function of an example program on a runtime system was taken from the requirements and is optional.
Project benefits (Outcome):	With the PLCopen-Editor GUI graphical PLC programs can be created. The languages FBD and SFC as well as the common logic blocks are available for this purpose. The programs can be saved or loaded as PLCopen XML or AML files. The exported file can be imported and loaded in other development environments (e.g. AML editor).

4. Project context

Initial situation
For the creation of PLC programs there is an editor of the open source project OpenPLC, which can be used as a reference.

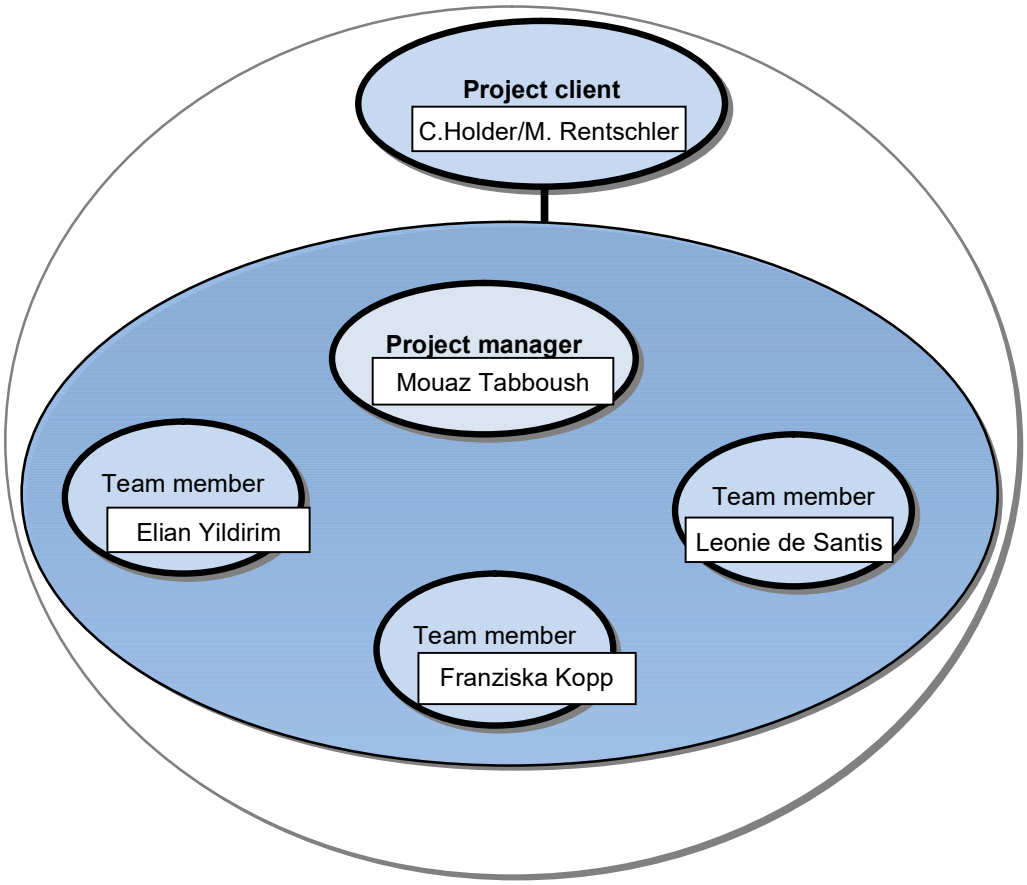
Temporal project context	
Pre-project phase	**Post-project phase**
• Familiarization in PLC • Familiarization with the OpenPLC editor	• Further PLC programming languages can be added • Additional function modules can be added

Factual project context	
Context	**Measures required**
Other projects and exams in the theoretical phase	Fair distribution of tasks within the team and keeping to deadlines
Projects in the practical phase and the resulting time constraints	Longer periods of time for tasks to be performed

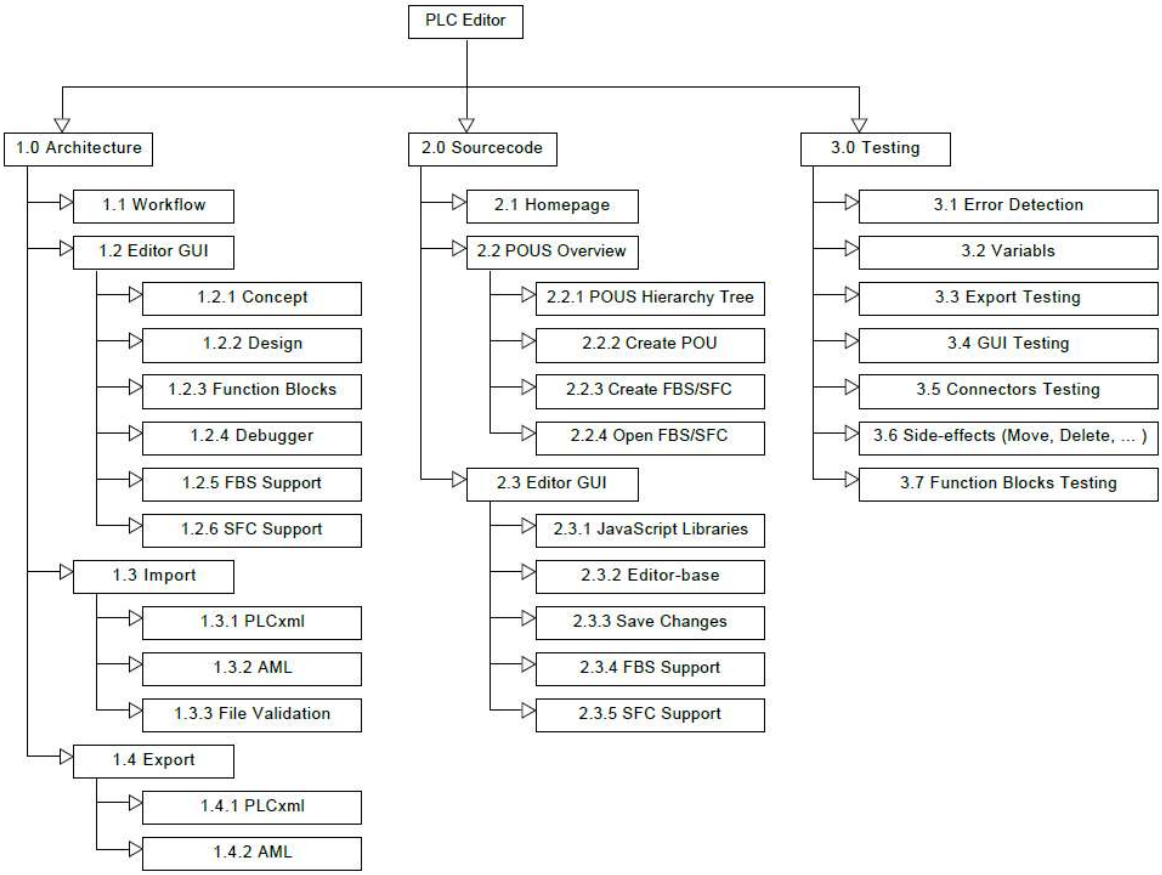
Social context			
Stakeholder group	**Potentials / Chances**	**Conflicts / Risks**	**Measures**
Client	Satisfied with the results	Changes in requirements during the project phase	Clear and regular communication between client and contractor
Contractor	Achieving the requirements	Difficulties within the team and time conflicts	Useful, regular meetings and keeping to deadlines
User	Using the PLCopen-Editor	difficulties in handling the program	Clear GUI structure and self-explanatory operation

5. Project organization

Project role	Role Description	Name
Project client	• Client	C. Holder M. Rentschler
Project manager	• Project manager und Test manager	Mouaz Tabboush
Team members	• Developer • Technical writer • Product manager • Test manager	Elian Yildirim Franziska Kopp Leonie de Santis



6. Work Breakdown Structure (WBS)



7. WP-Description

Work package: 0.0 Analysis	
WP content / outcome:	• CRS • SRS • BC • PM • SAS
Ownership:	Mouaz Tabboush, Leonie de Santis
Collaboration:	Elian Yildirim, Franziska Kopp

Work package: 1.0 Architecture/Design	
WP content / outcome:	• Workflow • Editor GUI • Import, Export
Ownership:	Elian Yildirim, Mouaz Tabboush
Collaboration:	Franziska Kopp, Leonie de Santis

Work package: 2.0 Coding	
WP content / outcome:	• Homepage • Project overview • Editor • FBD, SFC, FB • Import. Export
Ownership:	Elian Yildirim, Franziska Kopp
Collaboration:	Mouaz Tabboush, Leonie de Santis

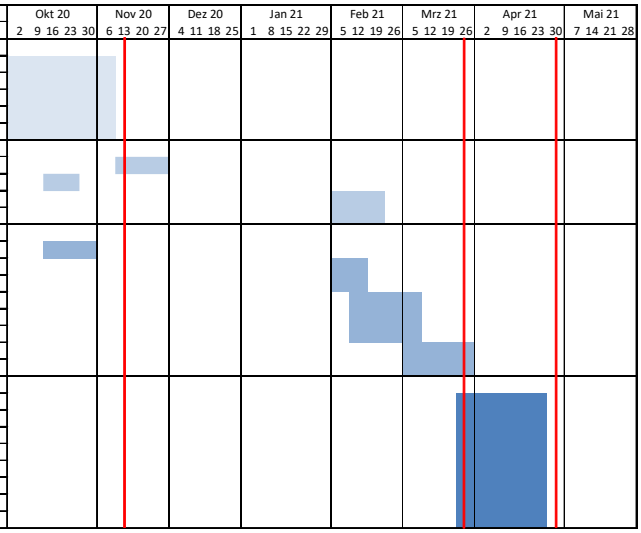
Work package: 3.0 Testing	
WP content / outcome:	• Error Detecting • Variables • Export: PLCopen XML / AML testing • GUI testing • Side-effects (Delete, Move, …) • Function Blocks
Ownership:	Franziska Kopp, Leonie de Santis
Collaboration:	Elian Yildirim, Mouaz Tabboush

8. Milestone plan

PSP-Code	Milestone name	PLAN - Date	ACTUAL - Date
0.0	**Analysis**		
0.1	CRS	06.11.2020	
0.2	BC	06.11.2020	
0.3	SRS	06.11.2020	
0.4	PM	06.11.2020	
0.5	SAS	06.11.2020	
1.0	**Architecture/Design**		
1.1	Workflow	27.11.2020	
1.2	Editor GUI	23.10.2020	
1.3	Import	19.02.2021	
1.4	Export	19.02.2021	
2.0	**Coding**		
2.1	Homepage	30.10.2020	
2.2	Project overview	12.02.2021	
2.3	Editor	12.02.2021	
2.3.4	FBD	05.03.2021	
2.3.5	SFC	05.03.2021	
	FB	05.03.2021	
	Import	26.03.2021	
	Export	26.03.2021	
3.0	**Testing**		
3.1	Error Detecting	23.04.2021	
3.2	Variables	23.04.2021	
3.3	Export testing	23.04.2021	
3.4	GUI-Testing	23.04.2021	
3.5	Connector-Testing	23.04.2021	
3.6	Side effects (Delete, Move, …)	23.04.2021	
3.7	Function Blocks Testing	23.04.2021	

9. Gantt chart

Nr.	Predecessor	Task Name	Duration	Start	End
1		Phase 1-Analyse			
2		CRS	40	02.10.2020	06.11.2020
3		BC	40	02.10.2020	06.11.2020
4		SRS	40	02.10.2020	06.11.2020
5		PM	40	02.10.2020	06.11.2020
6		SAS	40	02.10.2020	06.11.2020
7		Phase 2-Architektur/Design			
8		Workflow	14	13.11.2020	27.11.2020
9		Editor-GUI	7	16.10.2020	23.10.2020
10		Import	14	05.02.2021	19.02.2021
11		Export	14	05.02.2021	19.02.2021
12		Phase 3-Coding			
13		Homepage	14	16.10.2020	30.10.2020
14		Project overview	7	05.02.2021	12.02.2021
15		Editor	7	05.02.2021	12.02.2021
16	9,15	FBD	21	12.02.2021	05.03.2021
17	9,15	SFC	21	12.02.2021	05.03.2021
18	9,15	FB	21	12.02.2021	05.03.2021
19	10	Import	21	05.03.2021	26.03.2021
20	11	Export	21	05.03.2021	26.03.2021
21		Phase 4-Testing			
22		Error Detecting	28	26.03.2021	23.04.2021
23		Variables	28	26.03.2021	23.04.2021
24	19,2	PLCopen XML Testing	28	26.03.2021	23.04.2021
25	19,2	AML XML Testing	28	26.03.2021	23.04.2021
26	12	GUI Testing	28	26.03.2021	23.04.2021
27	16,17,18	Connectors Testing	28	26.03.2021	23.04.2021
28	15	Side-effects (Delete, Move,...)	28	26.03.2021	23.04.2021
29	16,17,18	Components	28	26.03.2021	23.04.2021



10. Project risks

Risk Analysis			
Risk	**Annotation**	**Probability of occurrence**	**Measure**
Personnel risks	Member leaves project	Low	Project plan will have to be adapted, so that the working hours of the missing member distributes to the left members
Planning risk	Milestones are not achieved at the planned time	Medium	Project plan will have to be adapted
Risk in communication between the members	Tasks are done in a different way than consulted or tasks are not done in time.	Medium	Regular meetings
Risk in communication to client	The project is not implemented the way the client wanted it to be.	Medium	As soon as there are concerns about how the client wants something to be implemented, the product manager will ask the client.
Financial risk	The planning of the costs is wrong and the project is more expensive than expected.	Low	As soon as there are concerns about the costs, the members of the project will discuss about how to reduce the costs.