**Customer Requirements Specification**

**(Lastenheft)**

(TINF20C, SWE I Praxisprojekt 2021/2021)

Project: Modelling Wizard for Cable-Models

Customer: Rentschler & Holder

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Allgemeine Hinweise:

Alles, was in dieser blauen Schriftart gesetzt ist, dient nur zur Erläuterung und sollte im fertigen Lastenheft nicht mehr auftauchen!

Der Umfang dieses Dokuments darf sechs Seiten nicht überschreiten.

Ein Lastenheft enthält eine grobe Beschreibung aller fachlichen Anforderungen, die das zu entwickelnde Produkt erfüllen muss. Die Inhalte des Lastenheftes (CRS) dienen als Grundlage für das Pflichtenheft und können -wenn sinnvoll- im Pflichtenheft (SRS) wieder verwendet werden.

#### ****Offene Punkte****

In diesem Abschnitt sollen alle Probleme und offenen Fragen gesammelt werden. Bei einem fertigen Lastenheft sollte er leer sein, aber bei Zwischenversionen kommt diesem Abschnitt besondere Bedeutung zu!

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# Goal

A webbased application should be developed, that provides an accessible and easy GUI for the configuration of a cable and the addition of device-interfaces (for example physical ports) and file-attachements [1]. Such configurations can be found in the catalogues of almost every cable-provider. A usability-analysis should give insight to existing solutions, the following results then influence the development. The file-output format should be in form of a AutomationML-Package, which must apply to the rules for AML-Componentmodels (AML-DDs). Furthermore the electrical interface-library should be expanded with new connector-types for single-pair-ethernet from the IEC63171-6 and M12-Push/Pull from the IEC 61076-2-010 .

Following tasks must be completed:

1. Analysis of existing solutions (z.B. Balluff, Murr-Elektronik, Harting, Phoenix-Contact)

2. Mockup of a GUI and an appropriate usability-concept

3. Support for CAEX 2.15 and CAEX 3.0 as output format (customizable)

4. Input fields for all neccessary parameters

5. Defintion of an exchangable data-model for the product-logic

6. Use and expansion of the AML-interface-library for electrical connectors

7. Use of the ANGULAR-framework for the GUI-creation

8. Creation of an extensive user-documentation

[1] 2021\_Steckverbinderkongress\_Rentschler\_1v0.pdf

[2] <https://www.automationml.org/download-archive/>

[3] IEC 61076-2-010

Dieser Abschnitt hat die Aufgabe als Einleitung zu dienen. Beschrieben wird die Hauptaufgabe des Systems. Meist kann man von der Aufgabenstellung bzw. Auftragsanfrage abschreiben. Wichtig ist es, den Grund für die Systementwicklung (Probleme oder Geschäftsideen) und damit ihre Ziele herauszuarbeiten.

Benennen Sie auch die Zielgruppe, die später mit dem System arbeiten soll.

# Product Environment

The usage environment of the modelling wizard for cable-models is characterized by its web-GUI for cable-onlineshops. This web-GUI is implemented with ANGULAR.

ANGULAR is a TypeScript (JavaScript deviation) based front-end framework for web development.

An important aspect of the software is the cable-configuration, that users use to configure their cables within the browser interface. Users can download the current configuration in form of an AutomationML-package that applies to the rules for AML-Componentmodels (AML-DDs).

AutomationML is a neutral, XML based data format for the storage and exchange of planning data. AutomationML is a open standard.

Furthermore the electrical interface-library should be expanded with new connector-types for single-pair-ethernet from the IEC63171-6 and M12-Push/Pull from the IEC 61076-2-010 .

Der Einsatzbereich des Modelling Wizard für Kabelmodelle ist in

Dieser Abschnitt hat die Aufgabe den Einsatzbereich des zu entwickelnden Systems klarzustellen. Dazu gehören Erläuterungen der notwendigen Fachbegriffe und deren Zusammenhänge ebenso wie die Darstellung der systemrelevanten Abläufe im Einsatzbereich.

Unter dem Produkteinsatz versteht man sowohl den direkten Problembereich, in dem das zu entwickelnde System eingesetzt werden soll, als auch die umgebenden Geschäftsprozesse.

Hier also den Problembereich des Projektes benennen und erläutern, ob es zu unterstützende Abläufe im Einsatzbereich (Geschäftsprozesse) gibt und wo sie zu finden sind.

Dieser Abschnitt muss so geschrieben sein, dass er, den Laien mit der Terminologie und den Zusammenhängen im Problembereich vertraut macht. Daher muss die Beschreibung möglichst allgemein sein. Außerdem sollte der Text gut strukturiert sein. Auch der Einsatz von erläuternden Graphiken ist manchmal sinnvoll.



Figure x: Product Environment

Wichtig ist es auch noch, gemachte Annahmen sauber von den oben beschriebenen Fakten getrennt aufzulisten. Dies erleichtert eine spätere Fehlersuche, wenn das System nicht die Erwartungen erfüllt.

# Product Usage

The Modelling Wizard for Cables should support the creation of new cable models with additional information for each created cable model, such as the number of contacts, layout of contacts and common connector names and descriptions.

It should be possible to easily create new cable models as soon as a new cable is registered in the inventory system of a business employing this Modelling Wizard. In this particular case, it does not matter whether the cable was acquired externally or created by R&D internally.

To this end, the Modelling Wizard has to support:

* the creation of new cable models,
* the displaying of existing cable models as an interactive list with details;
  + it will contain clickable entries to view the models in detail,
* the deprecation and deletion of cable models from the display list,
* searching and filtering the list of cables, and
* downloading of cable specifications as an AutomationML-package.

## Business Processes

### <BP.001>: New Cable is Registered in Inventory System

|  |  |
| --- | --- |
| Triggering Event: | Inventory system triggers messaging system to inform Distribution Manager of presence of new cable in the system |
| Result: | New cable model describing the newly added cable is created by the Inventory Control Manager and uploaded to the web server to be indexed and displayed. |
| In Roles: | Inventory Control Manager, Distribution Manager |

### <BP.002>: Cable is Marked as Deprecated in Inventory Management System

|  |  |
| --- | --- |
| Triggering Event: | Inventory system triggers messaging system to inform Distribution Manager of deprecation of cable |
| Result: | Inventory Control Manager deletes the defunct cable from the Cable Wizard web interface. |
| In Roles: | Inventory Control Manager, Distribution Manager |

### <BP.003>: Customer Lookup of Cable Information

|  |  |
| --- | --- |
| Triggering Event: | Customer visits Cable Wizard display page |
| Result: | Customer leaves happily, having found a fitting cable and the right information for their use of the cable |
| In Roles: | Customer |

## Use Cases

Capability

Cable Wizard

Search & Filtering

Cable Creation

File Export

Cable Deprecation

### <UC.001> New cable registration

|  |  |
| --- | --- |
| **Related Business Process:** | <BP.001>: New Cable is registered in inventory system |
| **Use Cases Objective:** | User wants to store information about a new cable in a safe environment where it is easily accessible |
| **System Boundary:** | Inventory system |
| **Precondition:** | The cable must not be already registered, the program has to run without errors. |
| **Postcondition on success:** | The cable is successfully registered with all specifications |
| **Involved Users:** | User and inventory system |
| **Triggering Event:** | The user acquires a new cable which they want to be registered in the inventory system |

### <UC.002> Deprecated cable

|  |  |
| --- | --- |
| **Related Business Process:** | <BP.002>: Cable is marked as deprecated in inventory management system |
| **Use Cases Objective:** | User wants to remove a deprecated cable from the database as it is not longer necessary |
| **System Boundary:** | Inventory system |
| **Precondition:** | The user has to choose an existing cable they want to delete, the program has to run without errors |
| **Postcondition on success:** | The cable model is removed from the inventory system |
| **Involved Users:** | User and inventory system |
| **Triggering Event:** | Due to any reasons the need for a certain cable is no longer given |

### <UC.003> Lookup

|  |  |
| --- | --- |
| **Related Business Process:** | <BP.003>: Customer Lookup of Cable Information |
| **Use Cases Objective:** | User needs a cable to fit their requirements or needs the specifications of a cable they used for a project |
| **System Boundary:** | Search Engine |
| **Precondition:** | The user has to define their demands and there must be a fitting cable already stored in the database, the program has to run without errors |
| **Postcondition on success:** | A fitting cable model is found for the user to view and/or download |
| **Involved Users:** | User and search engine |
| **Triggering Event:** | The user has special requirements or wants to look up the details of an existing cable |

## Features

### /Löschgruppenfahrzeug 10/ Login & User Authentication

The Login & Authentication system shall check if the entered credentials match the credentials saved in the authentication storage location and, in case of failure to authenticate, inform the user and deny access to the cable wizards modification functions.

After too many successive authentication failures, the system administrator will be informed about an unauthorized access attempt.

### /LF20/ Displaying a List of Cable Models in Database

The Cable Wizard will check if there are any cable model files to be displayed and, in case there are none, give an appropriate message to the user. Otherwise, the cables will be displayed in alphabetical order of their respective specified names.

### /LF30/ Deprecation of Cable Model

If the Cable Wizard receives a command for deletion of a cable model, it will check if the command for deletion came from an authenticated user. If not, the cable is not deleted, otherwise the model is purged from the database and the display page is refreshed, now without displaying the deleted cable.

### /LF40/ Searching and Filtering the Cable List

The Cable Wizard will check the list of cables, dynamically purging those from the list that do not fit the search criteria specified in a text box. If the search criteria do not match any cable, the user will be informed. Otherwise, a list of cables matching the search criteria is returned.

### /LF50/ Downloading Cable Specifications

The Cable Wizard will convert the information about a particular cable in the database into a AutomationML-compliant format and transfer that data to the user. If the resulting AutomationML-package fails integrity verification or syntax-checks, the user will be informed. Otherwise the download on the users side will begin.

# Product Data (Fabian)

In diesem Abschnitt werden die Hauptdaten und Datenschnittstellen beschrieben, mit denen das Softwareprodukt arbeiten soll und die bereits identifizierbar sind (siehe Abb. 1). Im Allgemeinen werden diese Hauptdaten eines Programms auch nonvolatil gespeichert.

## /LD10/ …..

…

## /LD20/ …..

….

# Other Product Characteristics (Thorsten)

This section describes the already known non-functional requirements for the product.

…

Die Aufgabe dieses Abschnittes ist die Beschreibung der nicht-funktionalen Anforderungen. Dabei handelt es sich um Charakteristiken oder Qualitäten, die das Produkt attraktiv machen und es von vergleichbaren Produkten unterscheiden.

In diesem Abschnitt werden die wesentlichen Eigenschaften des zu entwickelnden Produktes beschrieben, die nicht direkt die zu leistende Funktionalität betreffen.

In diesem Abschnitt sollen diese bereits definierbaren Anforderungen in „Balzert-Notation“ aufgelistet werden und nach den Regeln der Anforderungsschablone ([*https://www.sophist.de/fileadmin/SOPHIST/Puplikationen/Broschueren/SOPHIST\_Broschuere\_MASTeR.pdf*](https://www.sophist.de/fileadmin/SOPHIST/Puplikationen/Broschueren/SOPHIST_Broschuere_MASTeR.pdf)) ausformuliert werden.

## /NF10/ …..

The software/system shall support …

## /NF20/ …..

….

## System Environment

This section describes the system environment required to operate the product.

…

Hier sollten alle wesentlichen und notwendigen Parameter der Systemumgebung (Hardware, Software) beschrieben werden, soweit diese bereits festlegbar ist.

# References

[1] …

[2] …