TINF21C, SWE I Praxisprojekt 2022

Customer Requirements Specification (Lastenheft)

Project: **AAS-Management**

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Version History

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0.1	11.10.2022	Luka Dominik Pavic	Created
0.2	14.10.2022	Luka Dominik Pavic	Added Goal, Product Environment and Product Usage
0.3	15.10.2022	Luka Dominik Pavic	Added Product Data and other Product Characteristics
0.4	16.10.2022	Luka Dominik Pavic	Added Use Cases
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0.7	8.11.2022	Luka Dominik Pavic	Changed Targetgroup into User group, Corrected User group
1.0	XX.XX.2022	Luka Dominik Pavic	

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1 Concept and general conditions

This section illustrates the goal and product environment and presents the characteristics of the web application.

1.1 Goal

The goal of this project is to develop a web application that acts as a management system for the "Asset Administration Shell" (AAS). This specific web application shall have an identity and access management as well as a user administration with persistent data storage in MongoDB. The user administration enables a role distribution of the users in the user groups "Admin", "Advanced" and "Basic", whereby the role distribution is carried out manually via the Admin. Each role is equipped with different access rights and read permissions ("Advanced" gets full read access to all AAS and their submodels and "Basic" gets read access only to the basic submodels to all AAS), with the admin also having functions for managing AAS content and user management. This uses the specification of the concept as a REST API in openapi.

1.2 Product Environment

The AAS is a concept of the Industry 4.0 platform for the standardized implementation of "Industry 4.0 components", consisting of the digital twin in the form of the AAS and the associated physical object (the asset). This makes it possible in industry to provide digital twins that can be shared and combined across manufacturers and accessed via standardized interfaces.

1.3 Product Usage

This section reflects on different business processes and use cases which shall be covered by the web application.

1.3.1 Business Process

Nr. / ID	<AASM-BP.01>	Title	Log-In
Triggering Event	The user opens the GUI and wants to log in his account.		
Result	The user is logged in to their account and the GUI has been customized based on the user's user group.		
Involved Roles	Any user, GUI and database interface		

Nr. / ID	<AASM-BP.02>	Title	Log-Out
Triggering Event	The user opens the GUI and wants to log out of his account.		
Result	The user is logged out of their account and the GUI has been customized.		
Involved Roles	Any user and GUI		

Nr. / ID	<AASM-BP.03>	Title	Managing own Account
Triggering Event	The user wants to change his password and/or e-mail address.		
Result	The user changed the password and/or e-mail address.		
Involved Roles	Any user, GUI and database interface		

Nr. / ID	<AASM-BP.04>	Title	Administration
Triggering Event	The user – an admin – opens the GUI to administrate the AAS.		

Result	The user can delete and add AAS content and accounts. Moreover, classify accounts in user groups.
Involved Roles	Admin, GUI and database interface

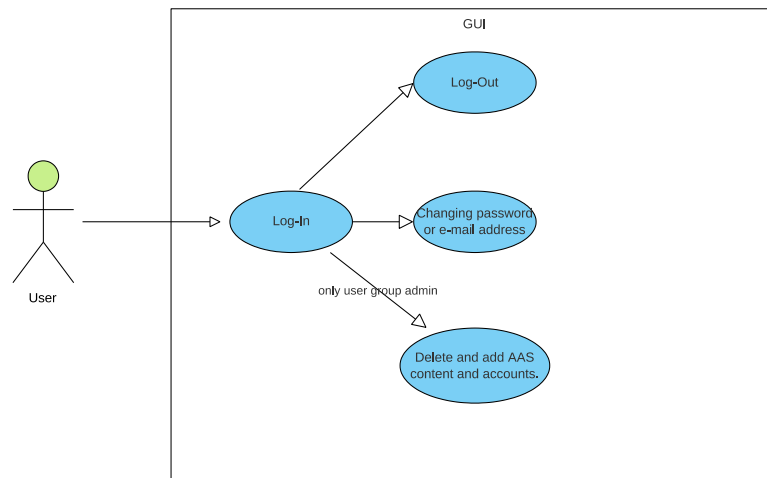| Nr. / ID	<AASM-BP.05>	Title	Search for an asset
Triggering Event	The user opens the GUI to find an existing Asset.		
Result	The user finds the Asset on GUI.		
Involved Roles	The user and GUI		

1.3.2 Use Cases

Figure 1: Use Case Overview Diagram

Nr. / ID	<AASM-UC.01>	Title	Log-In
Related Business Process	<AASM-BP.01>		
Use Cases Objective	User wants to log into account.		
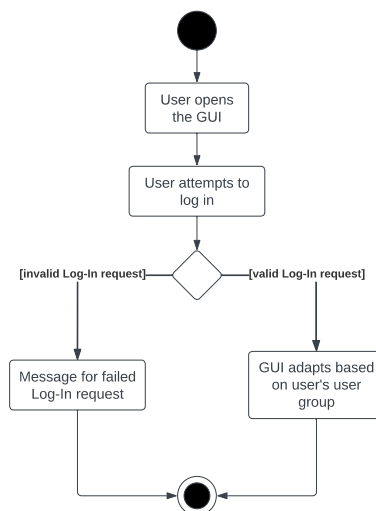
Figure 2a: <AASM-UC.01> User logs in
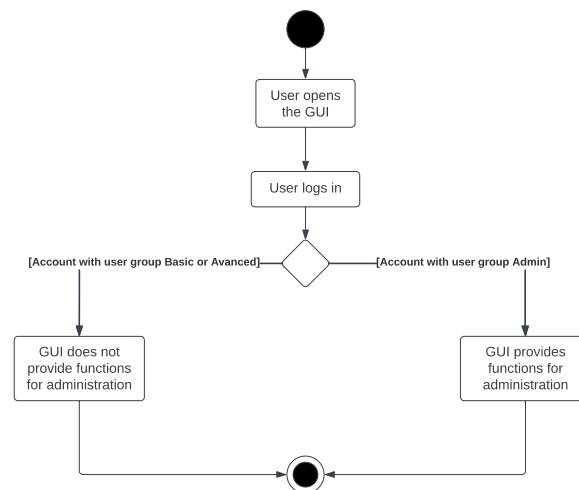
Figure 2b: <AASM-UC.01> User assignment to corresponding role

Nr. / ID	<AASM-UC.02>	Title	Log-Out
Related Business Process	<AASM-BP.02>		
Use Cases Objective	User wants to log out of his account.		
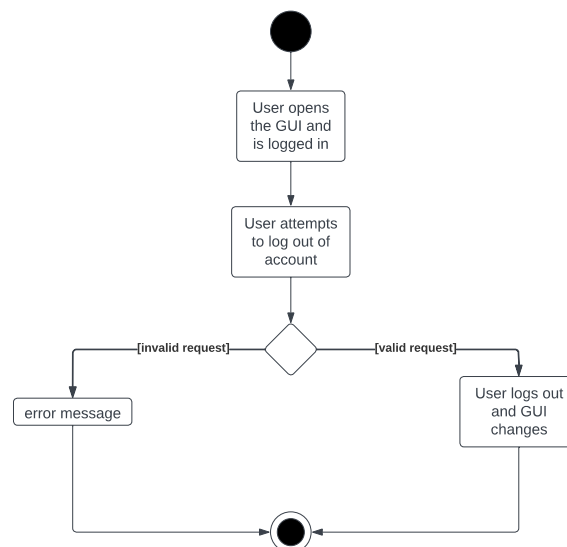
Figure 3: <AASM-UC.02> User logs out

Nr. / ID	<AASM-UC.03>	Title	Managing own Account
Related Business Process	<AASM-BP.03>		
Use Cases Objective	The user wants to use the self-services for e-mail and password change to modify these components of the account.		

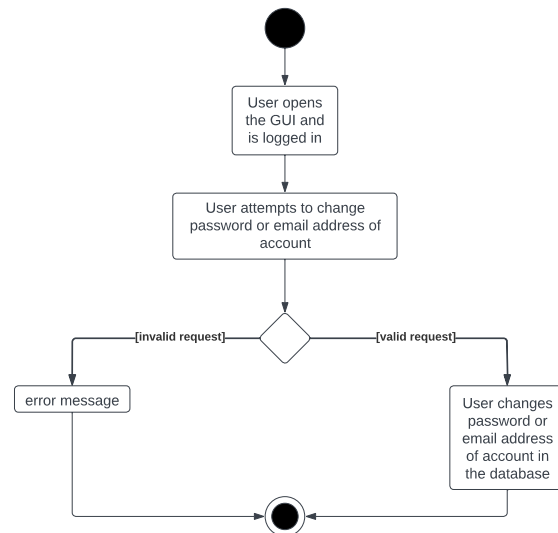Figure 4: <AASM-UC.03> User changes password or email address

Nr. / ID	<AASM-UC.04>	Title	Administrate AAS content
Related Business Process	<AASM-BP.04>		
Use Cases Objective	The user wants to add or delete the AAS content.		
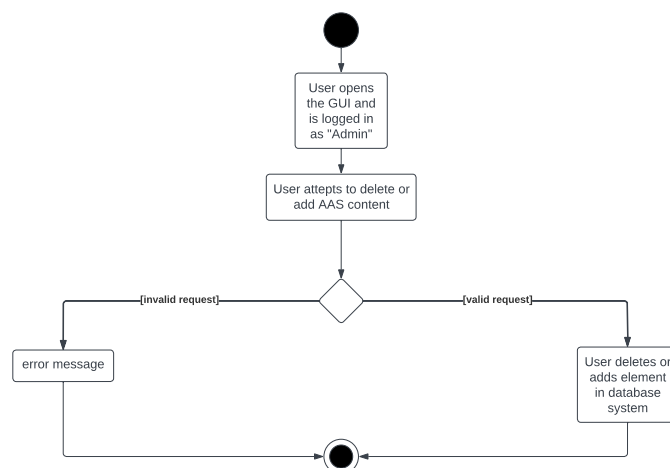
Figure 5: <AASM-UC.04> User administrates AAS content

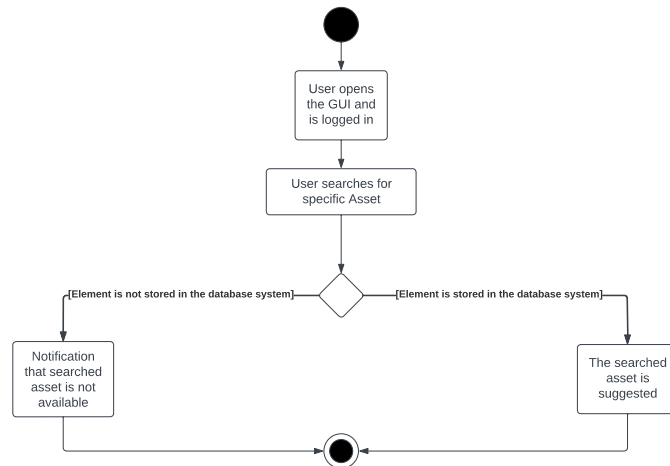| Nr. / ID	<AASM-UC.05>	Title	Administrate accounts
Related Business Process	<AASM-BP.04>		
Use Cases Objective	The user wants to add or delete accounts. The user also wants to divide the accounts into user groups (Basic, Advanced and Admin).		

Figure 6: <AASM-UC.05> User administrates accounts

Nr. / ID	<AASM-UC.06>	Title	Find asset
Related Business Process	<AASM-BP.05>		
Use Cases Objective	The user searches for an asset to find it in the GUI or receives a notification that the asset is not present.		

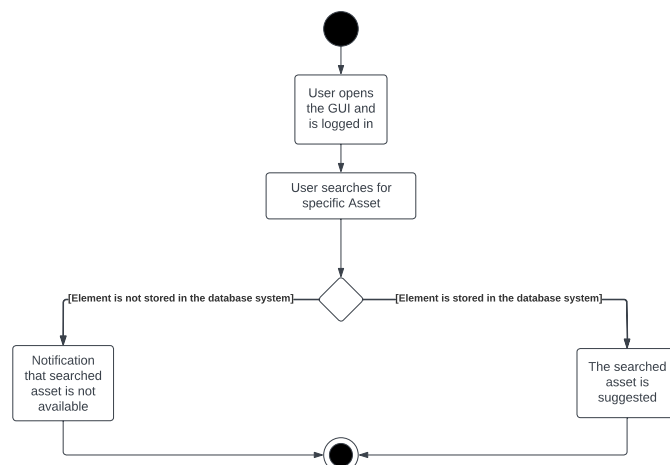*Figure 7: <AASM-UC.06> User searches asset*

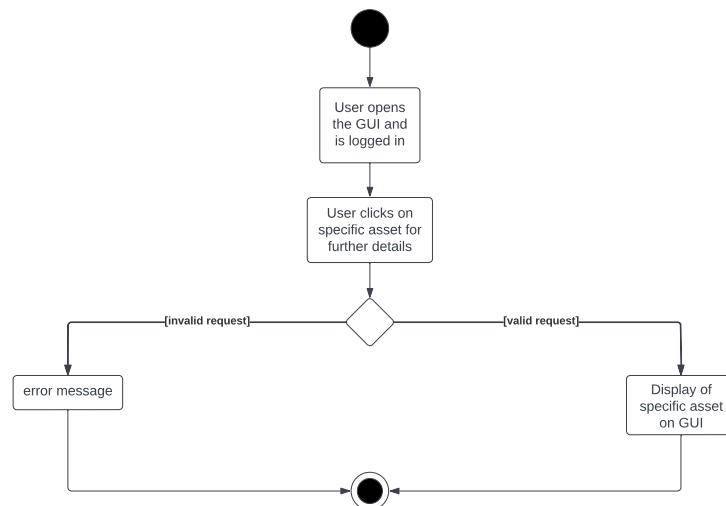| Nr. / ID	<AASM-UC.07>	Title	Display asset
Related Business Process	<AASM-BP.05>		
Use Cases Objective	The user finds the asset and clicks on it for display purposes and further details.		

Figure 7: <AASM-UC.06> User wants to display asset

1.4 Features

The following functionalities shall be met by the web application.

1.4.1 /AASM-F10/ Identity & Access Management

The web application shall have centralized management of identities and access permissions, with role-based access rights. The web application shall have functions for authentication and authorization of users and a self-service for users such as email and password change.

1.4.2 /AASM-F20/ AAS content data management

The user (more precisely the user with the role of Admin) has the possibility to upload and delete AAS content. The content to be uploaded is in a file format.

1.4.3 /AASM-F30/ Search functionalities

The user should be able to effectively find desired AAS content using search functions. The user should be able to effectively find the desired content of the AAS using search functions.

1.4.4 /AASM-F40/ Rest-API Support

The software shall support the Rest-API standard for communication between the client and database system.

1.4.5 /AASM-F50/ Error Display

The software should check whether an error has occurred. If an error occurs, the user should receive an easily readable and understandable error message.

1.5 Product Data

The following lists the data structures of the web application.

1.5.1 /AASM-D10/ MongoDB

The web application should enable persistent data storage with MongoDB as the database management system used.

1.6 Other Product Characteristics

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

1.6.1 /AASM-NF10/ Usability

Usability is to be ensured by a simple layout and by a human-centered interface. It should be clear and easy to use so that the user can achieve the objectives efficiently and satisfactorily.

1.6.2 /AASM-NF20/ Reliability

Reliability is to be ensured by a responsive GUI with high error tolerance and a database with accurate and consistent data.

1.6.3 System Environment

AAS Management is a web application and therefore only requires an Internet connection and an installed web browser on the computer work.

1.7 User group

The user group shall not depend on gender, marital status or age. The only dependencies are in the profession, here the user should be in contact with Industry 4.0, accordingly his place of residence is at best in an industrial state. Another dependency is the education with a school degree and the interest in technical topics.

2 Release / Approval

Approval is made by the customer and the suppliers

Date:	
Signature Customer:	
Signature Suppliers:	

3 References

[1]

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