04/12/2017 Kyle James Watson STC905

CRN

34129

Semester One Assessment 1

Software Projects with Agile Techniques

# **Executive Summary**

Using various UML techniques and software I have modelled the system and its interactions with users. I have identified 3 different primary actors with 11 use cases split across 2 different systems. The system has been modelled with 8 different classes which users will be able to utilise depending on their access to the system. For each use case I have planned for numerous outcomes alongside the desirable path.

Actors and Use Cases:

Maintenance Engineer:

* Search CSW for part types UC1
* Search Inventory for part types UC7
* Take spare parts UC2
* Sign part back UC3
* Install part UC8
* Register engineer UC11

Team Leader:

* Search CSW for part types UC1
* Search Inventory for part types UC7
* Take spare parts UC2
* Sign part back UC3
* Install part UC8
* Register engineer UC11
* Authorise item UC9
* Create team UC10

Store Manager:

* Purchase spare part UC4
* Reconcile invoice UC5
* Refurbish spare part UC6

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# **Introduction**

## *Assumptions made modelling the system:*

From the system specification, I assume that a team leader is also an engineer as they can perform all the same actions, but the team leader can perform exclusive actions.

I also assume that the supplier would not need to interact with the system to send parts. Order details can be sent to the supplier using pre-existing systems e.g. email, when suppliers send the items they are handled by the system on arrival.

## *Use Cases and Actors:*

After examining the specification, I was able to identify potential actors and their use cases. For each use case I extrapolated details and steps to fill out the full textual representation. From there, I was able to see how each actor interacted with each use case in order to draw a use case diagram.

## *Class Diagram:*

Using the actors and use cases identified in the system, as well as assumptions made, I was able to create appropriate classes that make use of association and aggregation in order to accurately model interactions with the system.

## *Sequence Diagram:*

Using information gathered from the use cases I was able to draw sequence diagrams for two interactions. These diagrams detail out information sent between different actors and different systems in order to visualise how data will be shared.

# **Textual Use Cases**

|  |  |
| --- | --- |
| **Use Case Title** | **Search CSW for part types UC1** |
| Primary Actor | Maintenance Engineer, Team leader |
| Goal | Engineer wishes to receive a list of part types from CSW |
| Scope | Power Station System |
| Preconditions | Maintenance Engineer or team leader is registered as such |
| Postconditions | List of queried part types are displayed |
| Main Success Scenario | 1. Engineer or team leader enters query for a part name 2. List of matching parts is displayed |
| Extensions | 1a. Engineer or team leader enters query for asset tag number which also displays a list of parts  1b. Engineer or team leader enters a query for description which also displays a list of parts  2a. No parts match the query so no parts are displayed. |

|  |  |
| --- | --- |
| **Use Case Title** | **Search inventory for part types UC7** |
| Primary Actor | Maintenance Engineer, Team leader |
| Goal | Engineer or team leader wishes to receive a list of part types from the inventory |
| Scope | Power Station System |
| Preconditions | Maintenance Engineer or team leader is registered as such |
| Postconditions | List of queried part types are displayed |
| Main Success Scenario | 1. Engineer or team leader enters query for a part name 2. List of matching parts is displayed |
| Extensions | 1a. Engineer or team leader enters query for asset tag number which also displays a list of parts  1b. Engineer or team leader enters a query for description which also displays a list of parts  2a. No parts match the query so no parts are displayed. |

|  |  |
| --- | --- |
| **Use Case Title** | **Take spare parts UC2** |
| Primary Actor | Maintenance Engineer, Team leader |
| Goal | Engineer or team leader wishes to take a part from the CSW |
| Scope | Power Station System |
| Preconditions | Maintenance Engineer or team leader is registered as such |
| Postconditions | Part is removed from the CSW and added to the power station inventory |
| Main Success Scenario | 1. Engineer searches for part in CSW UC1 2. Engineer or team leader requests part by asset tag number 3. If the value of the part is above £50,000 the request is authorised by the team leader UC9 4. Part is transferred from the CSW into the power station inventory |
| Extensions | 1a. Part requested isn’t available  2a. Team leader denies the request |

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| --- | --- |
| **Use Case Title** | **Sign part back UC3** |
| Primary Actor | Maintenance Engineer, Team leader |
| Goal | Engineer or team leader wishes to transfer an old or unused part |
| Scope | Power Station System |
| Preconditions | Maintenance Engineer or team leader is registered as such  Part is in power station inventory |
| Postconditions | CSW stores, refurbs or disposes part |
| Main Success Scenario | 1. Engineer or team leader enters asset tag number 2. Engineer or team leader enters reason for return 3. Engineer or team leader sends part back |
| Extensions |  |

|  |  |
| --- | --- |
| **Use Case Title** | **Install part UC8** |
| Primary Actor | Maintenance Engineer, Team leader |
| Goal | Engineer or team leader wishes to install a part to replace an old part |
| Scope | Power Station System |
| Preconditions | Maintenance Engineer or team leader is registered as such  Part needing replacing |
| Postconditions | Old part is handled and new part is installed |
| Main Success Scenario | 1. Engineer or team leader takes spare part UC2 2. Engineer or team leader returns old part UC3 3. Engineer or team leader installs new part |
| Extensions | 1a. Engineer or team leader needs to search warehouse or inventory for part UC1 UC7  2a. |

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| --- | --- |
| **Use Case Title** | **Purchase spare part UC4** |
| Primary Actor | Store manager |
| Goal | Manager wishes to receive part from supplier for CSW |
| Scope | Power Station System |
| Preconditions | Manager received requisition from team leader |
| Postconditions | Part been added to CSW |
| Main Success Scenario | 1. Manager produces purchase order 2. Manager sends order to supplier 3. Supplier sends part and invoice 4. Store manager reconciles invoice 5. Store manager authorises payment |
| Extensions | 5a. Invoice is not legitimate and payment is not authorised |

|  |  |
| --- | --- |
| **Use Case Title** | **Reconcile invoice UC5** |
| Primary Actor | Store manager |
| Goal | Manager wishes to make legitimate payments to suppliers |
| Scope | Financial management system |
| Preconditions | System received invoices for parts |
| Postconditions | Supplier is paid |
| Main Success Scenario | 1. Manager reconciles invoice against the purchase 2. Manager enters payment details 3. Manager authorises payment |
| Extensions | 1a. Invoice is not legitimate and payment is not authorised |

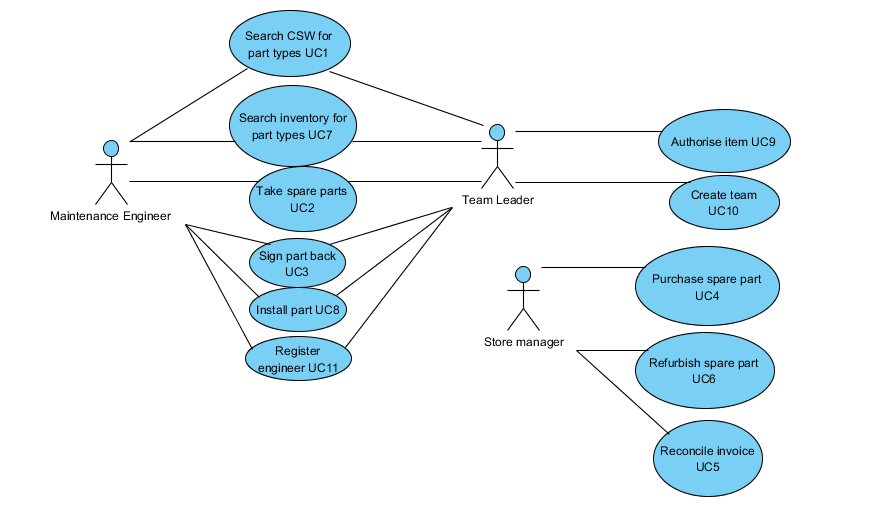
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| --- | --- |
| **Use Case Title** | **Refurbish spare part UC6** |
| Primary Actor | Store manager |
| Goal | Manager wishes to refurb an old part |
| Scope | Power Station System |
| Preconditions | Part is not damaged beyond refurbishment |
| Postconditions | CSW adds refurbished part |
| Main Success Scenario | 1. Engineer returns part to CSW 2. Manager raises a refurbishment purchase order 3. Part is sent to supplier 4. Supplier refurbishes part 5. Supplier sends part and invoice 6. Manager reconciles invoice 7. Manager authorises payment |
| Extensions | 1a. Part doesn’t need refurbishment so is added directly to CSW  4a. Part is damaged beyond refurbishment and is scrapped  7a. Invoice is not legitimate and payment is not authorised |

|  |  |
| --- | --- |
| **Use Case Title** | **Authorise item UC9** |
| Primary Actor | Team leader |
| Goal | Team leader wishes to authorise a part requested by engineer |
| Scope | Power Station System |
| Preconditions | Team leader is registered as such  Part has a value above £50,000 |
| Postconditions | Engineer receives part into inventory |
| Main Success Scenario | 1. Engineer requests part 2. Team leader authorises request |
| Extensions | 1a. Part is less than £50,000  2a. Request is invalid and is denied |

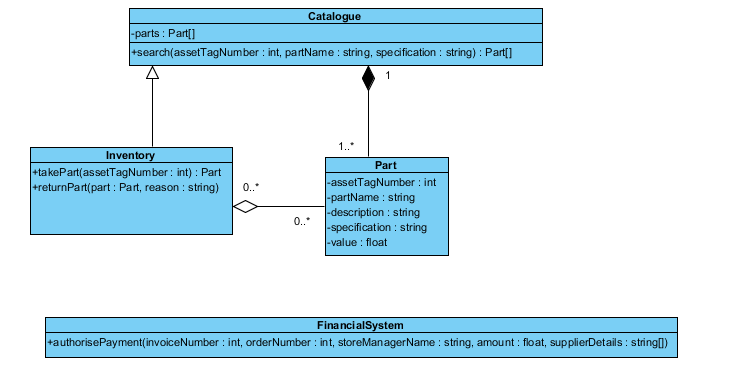
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| --- | --- |
| **Use Case Title** | **Create Team UC10** |
| Primary Actor | Team leader |
| Goal | Team leader wishes to create a new team of engineers |
| Scope | Power Station System |
| Preconditions | Team leader is registered as such |
| Postconditions | Team leader becomes leader of new team |
| Main Success Scenario | 1. Engineers register as type of engineer UC11 2. Team leader chooses specific engineer type 3. Engineers of that type join the team |
| Extensions | 3a. No engineers of that type available team cannot be created |

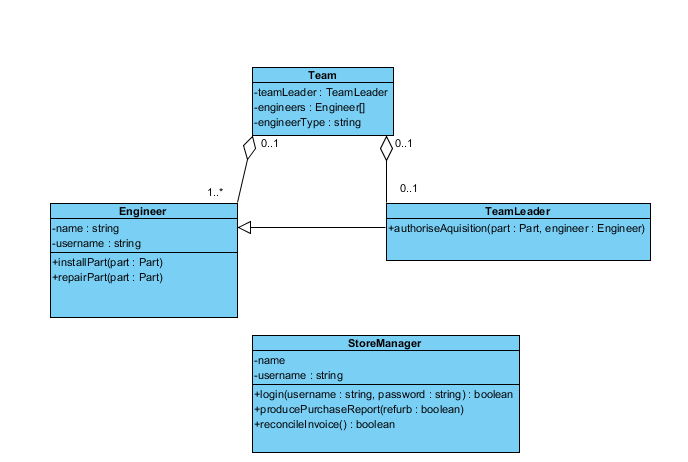
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| --- | --- |
| **Use Case Title** | **Register Engineer UC11** |
| Primary Actor | Engineer |
| Goal | Engineer wishes to be registered on system |
| Scope | Power Station System |
| Preconditions | Engineer is employed by the power station |
| Postconditions | Engineer can use the system |
| Main Success Scenario | 1. Engineer enters personal information 2. Engineer enters engineer type 3. Engineer sends details to store manager for authorisation 4. Manager authorises registration |
| Extensions | 4a. Details are incorrect and registration is not authorised |

# **Use Case Diagram**



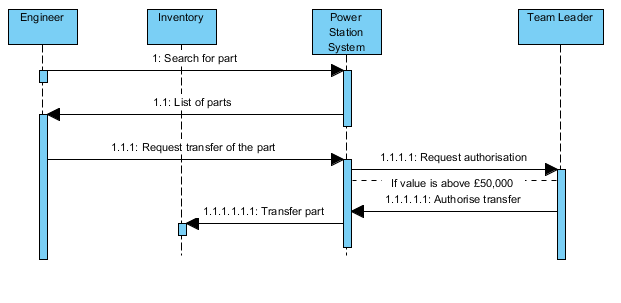
# **Class Diagram**





# **Sequence Diagrams**

### *Take Spare Part UC2*



### *Create Team UC10*

