FACTORY SIMULATION SOFTWARE SYSTEM

SEQUENCE DIAGRAMS AND USE CASES

GROUP-6

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1. INTRODUCTION

1.1 PURPOSE

The purpose of this document is to show all the use cases involved in this project and establish relationships between them. Sequence diagram is used to depict the objects involved in the scenario and the sequence of messages exchanged between them.

1.2 DEFINITIONS:

FSSS:

Factory Simulation Software System.

Head:

Factory Head manages the whole factory. The Head gets statistics from the service manager and Head analyzes those statistics.

Adjuster:

A person who repairs machines in the factory by taking orders from the service manager.

Service manager:

A person who assigns work to adjusters and maintains the working statistics of adjusters and machines and submit that corresponding data or statistics to the factory head. Service manager separately maintains Machine Queue and Adjusters Queue.

Machine Queue:

A queue is a linear data structure which follows the first in first out method . Here Machine queue refers to the queue of inoperative machines.

Adjuster Queue:

Here Adjuster queue refers to the queue of free adjusters.

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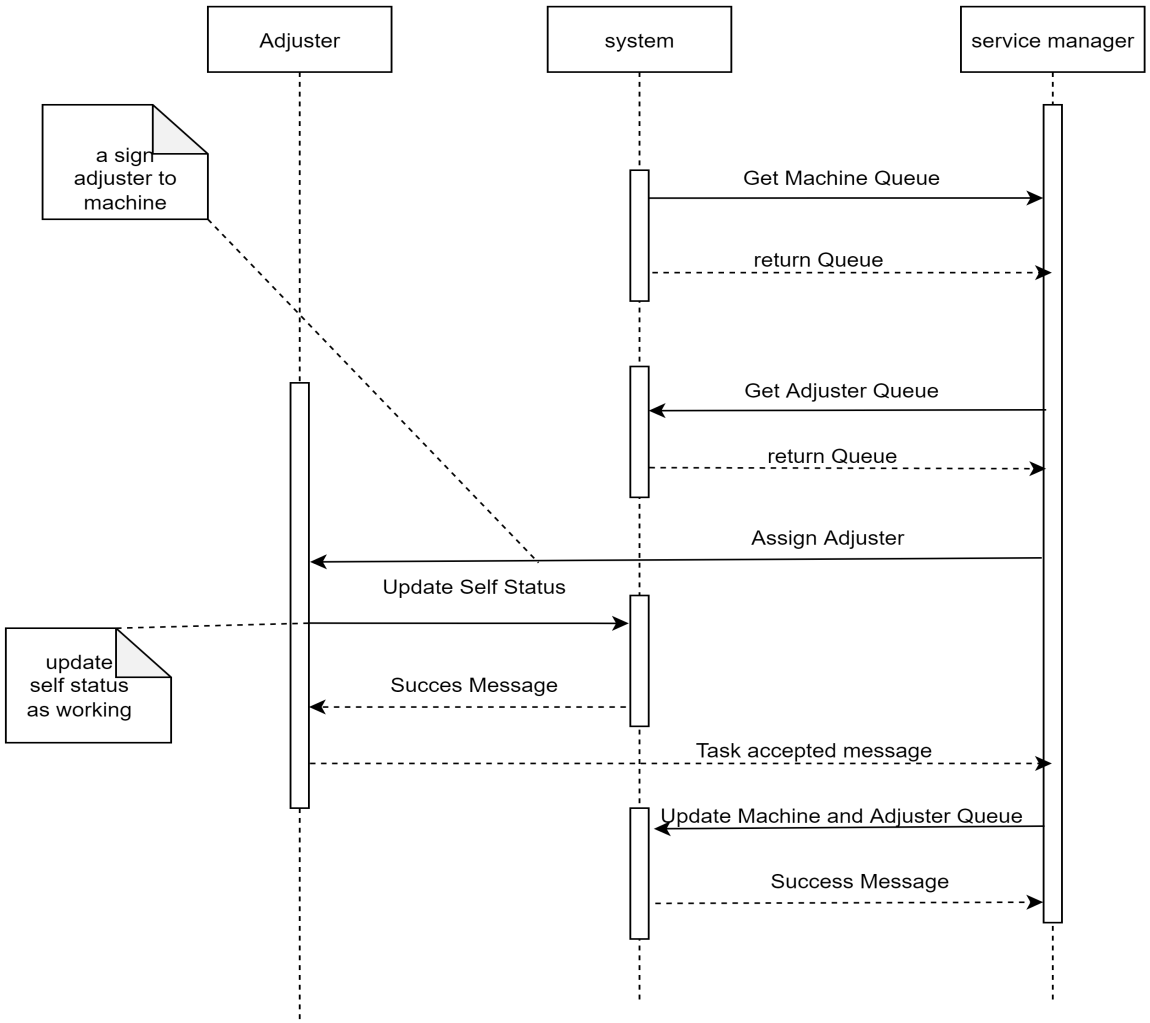
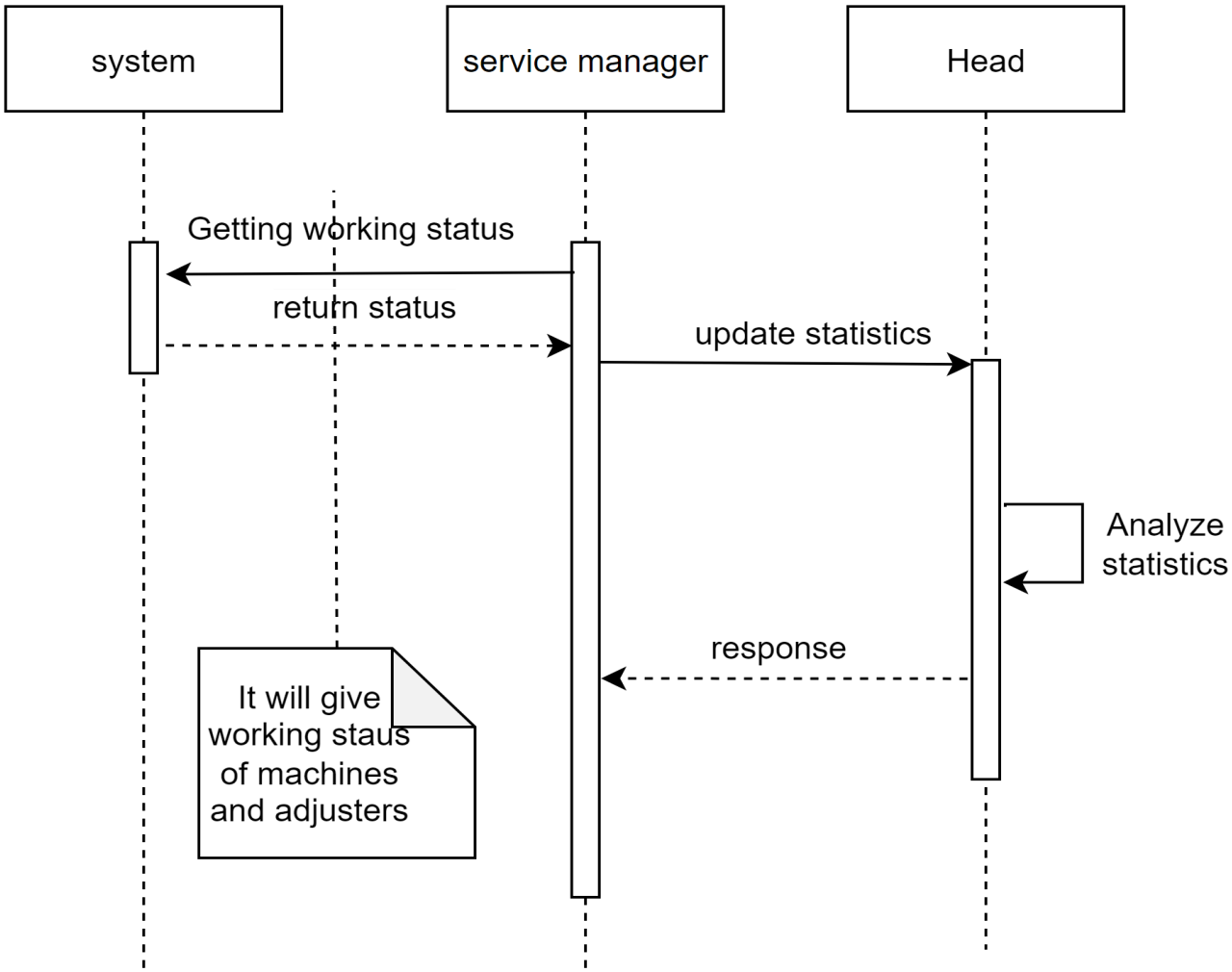
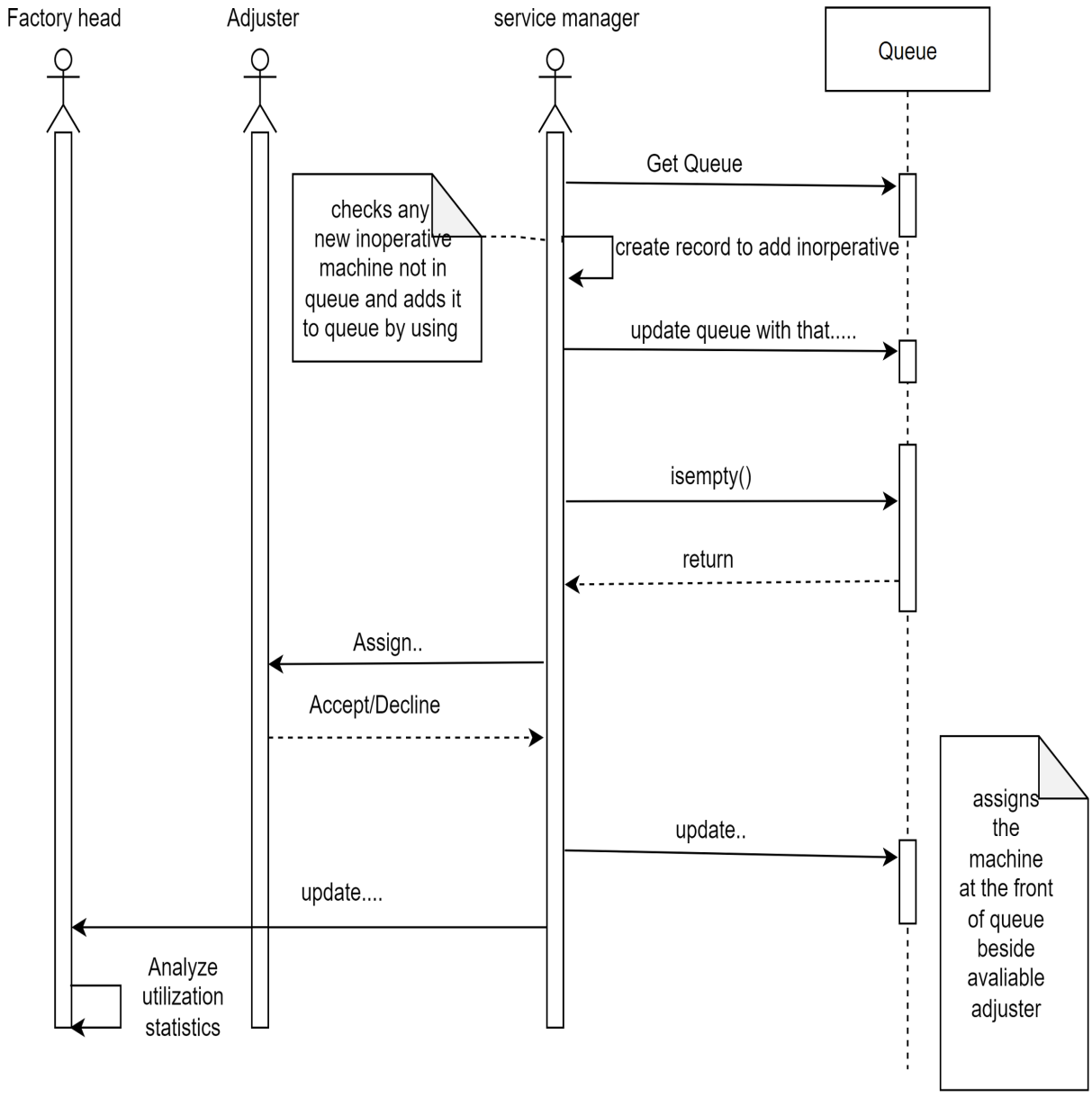
2. SEQUENCE DIAGRAMS



SEQUENCE DIAGRAM OF ADJUSTER



SEQUENCE DIAGRAM OF UPDATE STATISTICS



SEQUENCE DIAGRAM OF SYSTEM

3 USE CASES

Functional Requirements are those that refer to the functionality of the system, i.e. what services it will provide to the user. Non-functional requirements pertain to the other information needed to produce the correct system and are detailed separately.

In software and systems engineering, a use case is a list of steps, typically defining interactions between a role (known in Unified Modeling Language (UML) as an "actor") and a system, to achieve a goal. The actor can be a human or an external system. In systems engineering, use cases are used at a higher level than within software engineering, often representing missions or stakeholder goals.

Following are the different use cases(Here includes: inclusions, use cases: extensions).

Use Case: Login

Actors: Head, Adjuster, Service Manager
Type : Primary and essential

Description: This use case is initiated when the user tries to log in to the system. The user is then prompted to enter in their username and password in order to Proceed and access their account and these credentials are unique for every user. Two users can not have the same username. Every user has to go through this step to do any work in the factory. For login, the user must first signup with our web software.

Includes: None
UseCases: None

Use Case: Get Adjuster Queue

Actors:Service Manager
Type:Primary

Description: This use case gives information to the logged-in users about the adjusters which are currently free. This use case is required to get an adjuster which can be assigned to inoperative machines.

Includes: None
UseCases:The Login use case must be completed.

Use Case: Get Machine Queue

Actors:Service Manager
Type:Primary

Description : This use case gives the information to the logged in users about the machines which are inoperative. This use case is required to get a machine which requires an adjuster.

Includes: None
UseCases :The Login use case must be completed.

Use Case: Assign Adjuster

Actors:Service Manager
Type:Primary

Description : This use case is required to assign free adjusters to inoperative machines depending on the status of machine and adjuster queues.

Includes : Update Machine and Adjuster Queue use cases.
UseCases : Login, Get Adjuster queue, Get Machine queue use cases must be completed.

Use Case: Update Machine and Adjuster queue

Actors:Service Manager
Type:Primary

Description : This use case is called when there is a modification in the queue as when some adjuster is assigned to an inoperative machine, the queue should be modified.

Includes: None.
UseCases :Login, Assign Adjuster, Get Adjuster queue and Get Machine queue must be completed.

Use Case: Check and add inoperative Machine

Actors:Service Manager
Type:Primary

Description : User is supposed to check regularly if there is a machine that is inoperative. If the machine is not in the queue and is inoperative then it is added to the queue. This will give mean time to failure (MTTF) for each type of machine (lathe machines, turning machines, drilling machines, soldering machines etc.)

Includes : Update machine and adjuster use case.
UseCases :Login, Get Machine queue use cases must be completed.

Use Case: Check and add free adjusters

Actors: Service Manager
Type: Primary

Description : User is supposed to check regularly if there is an adjuster that is currently free.If the adjuster is not in the adjuster queue and is currently free then it is added to the queue

Includes : Assign Adjuster and Get queue use case.
UseCases : Login, Get queue use cases must be called.

Use Case: Get Working Status of Machines and Adjusters

Actors: Service Manager
Type: Primary

Description : User executes this step to collect working statistics of machines and adjusters.

Includes :Update Statistics use case.
UseCases : Login use cases must be completed.

Use Case: Update Statistics

Actors:Service Manager
Type:Primary

Description : After completing the work, when the user needs to submit the working statistics to the head, this use case is initiated.

Includes:None
UseCases :Login , Get Working Status of machines and adjusters use cases must be completed.

Use Case: Get Statistics

Actors:Head
Type:Primary

Description : This use case gives the working statistics to the head ie. statistics of machines and adjusters.

Includes: None

UseCases :The Login use case must be completed.

Use Case: Analyse Statistics

Actors:Head
Type:Primary

Description : Using this use case, the user gets the analysis of ongoing work in the factory and also gets to know about machine and adjuster utilization in the factory.

Includes: Response to service manager use case.
Extend: Machine utilization and adjuster utilization.

UseCases : Login , Get Statistics use cases must be completed.

Use Case: Response to service manager

Actors:Head
Type:Primary

Description :This use case is used to respond to the analysis of adjuster utilization and machine utilization.

Includes:None
UseCases : Login , Get Statistic and Analyze adjuster and machine Utilization use cases must be completed.

Use Case: Repair machine

Actors:Adjuster
Type :Primary and essential

Description : This step gets initiated by the user to get to know which machine the user has to repair.

Includes: Update machine status.
UseCases: Login use case must be completed.

Use Case: Update machine Status

Actors:Adjuster
Type :Primary and essential

Description:After repairing the machine it's the user's responsibility to execute this use case and to update machine status as working as well as declare itself as a free adjuster.

Includes:None
UseCases:Login use case must be completed.

Use Case: Logout

Actors:Head, Service Manager, Adjuster
Type :Primary and essential

Description: Every user needs to log out from the system after completing the work. This is the one of the most important things users should remember to execute.

Includes:None
UseCases :Login use case must be completed .
