FACTORY SERVICE SIMULATION SOFTWARE

SOFTWARE ANALYSIS and STRUCTURED DESIGN (SA/SD)

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1.0 Introduction

1.1 Purpose

This SA/SD Document provides a complete description of all the functions and specifications of the Factory Service Simulation Software (FSSS) developed for determining the machine utilization and adjuster utilization of a Factory. And, also optimum number of adjusters they should employ.

The expected users of this software are the Service Manager of a Factory.

1.2 Scope

This software system will be a Factory Service Simulation Software System. This system will be designed to maximize the ease that how the factory service manager should assign the adjuster to repair the machine to achieve maximum utilization of both machines and adjusters. The automation property of the system will make the working system very simple, fast and free of Human-errors. By maximizing the user's work efficiency the system will meet the user's needs while remaining easy to understand and use.

1.3 Glossary

FSSS - Factory Service Simulation Software

DFD - Data Flow Diagram

1.4 References
IEEE_Std_830_1998___Recommended_Practice_for_SA/SD

1.5 Overview of the Document
The below chapters and their contents are:
Section 2 is the Feasibility study which helps us understand the problem by analyzing the
stakeholders and their functions and also their alternatives

Section 3 is Requirements analysis where the various functional and non-functional requirements are elucidated.

Section 4 is the last section where the Global System Architecture is defined and the platform
including hardware, software and networking.

2.0 Feasibility Study

2.1 Understanding the Problem

FSSS is intended to determine the machine utilization and adjuster utilization of a Factory. It is used to help various stakeholders in the process realize their responsibility properly and promptly. Since everything is automated, there is very less scope for inconsistency and ambiguities.

2.2 Scope of the Problem

- Assignment of inoperative machine to the available adjuster by the Service Manager.
- Assignment of adjuster to the inoperative machine by the Service Manager.
- Repairing the assigned machine by the adjuster.
- Getting the machine utilization and adjuster utilization by Head.

2.3 Analyzing the Stakeholders

There are a set of registered people in the system.

- *Adjusters.*

- *Service Manager.*

- *Head of the Factory.*

Adjuster : First, the Adjuster logs in the system using his username and password. Adjusters repairs the Inoperative machine assigned by the Service manager.

Service Manager : The System responds when the Service Manager update the Queues. First, the Service Manager logs in the system using his username and password. The dialog box which opens has three options : Get Queue, Update Queue and Assign Adjuster to repair a machine. Each option does the thing as its name suggests.

Head : First, the Head logs in the system using his username and password. Then, Head analyzes statistics which includes Machine Utilization and Adjuster Utiization.
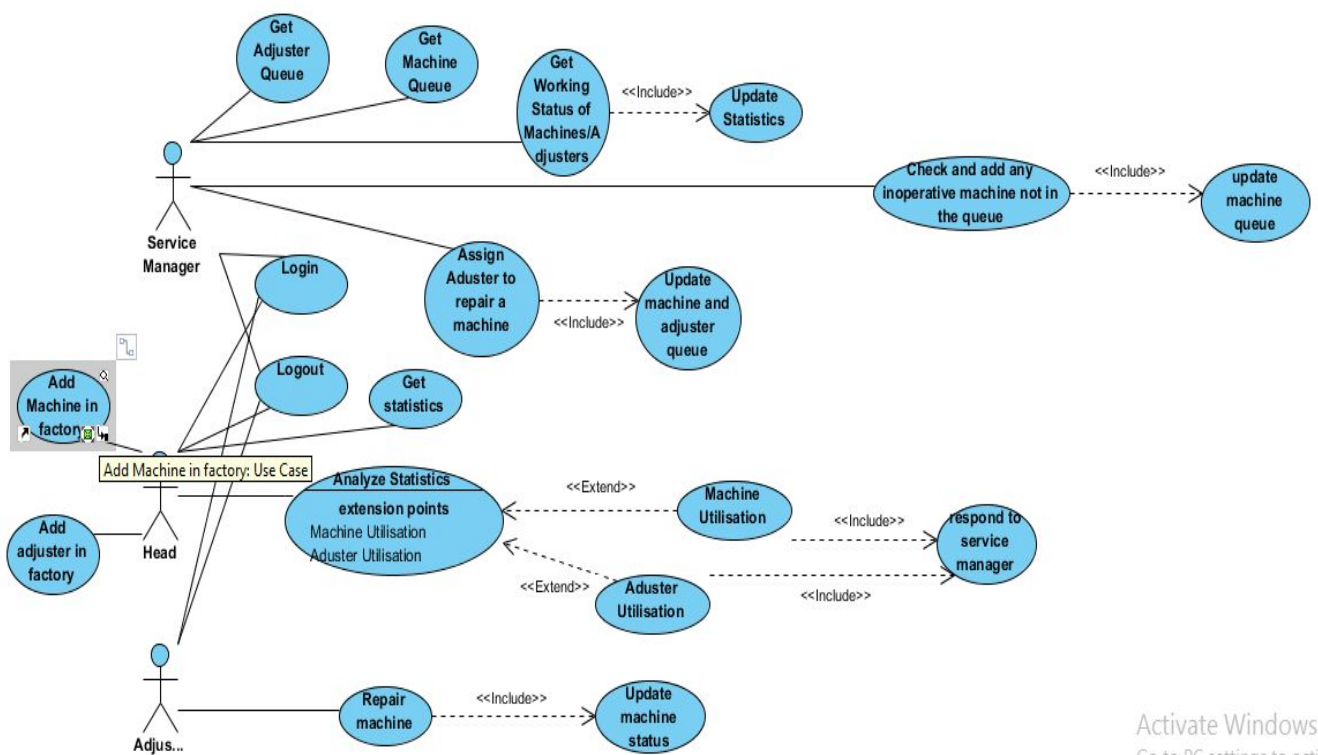
USE CASE DIAGRAM OF ADJUSTER , SERVICE MANAGER , AND HEAD OF THE FACTORY.

2.4 Defining Alternatives

The software is designed to run on both Linux and Windows Operating Systems. Instead of using the internal hard drive of the system, we can use an external hard drive to store the database and also keep multiple copies of the data. The GUI Implementation of the system is the default style provided. It can be customized to suit the user's needs.
The system can be modified to include two layers of security instead of just one present now.

2.5 Assessment of Unusual Circumstances

The data must be taken care of so that it is never lost in any case, be it hardware/software failure, system going down or any unusual circumstance. Care should be taken such that the usernames and passwords of all the different users of the system are never compromised and also can be changed/recovered if they are lost/forgotten

2.6 Report

In the present section, we went through the various details of the problem statement. The objectives and scope have been presented in detail. Then, the roles of different stakeholders were analyzed. The alternatives were developed while noting the cost and lifetime of the parts the alternative brings. The alternatives include software, hardware and security. The primary criteria of evaluation of the alternatives were discussed.

3.0 Requirements Analysis

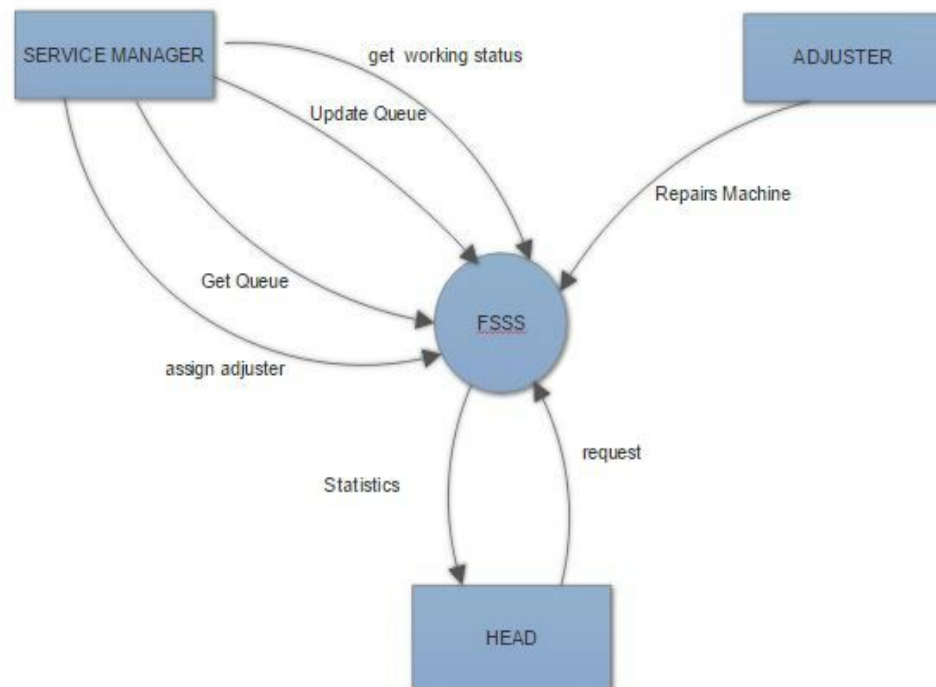## 3.1 Functional Requirements

3.1.1 Data Flow

Context Diagram

The FSSS is shown as a process with the Adjuster, Service Manager and Head as external entities.

Inputs: Add Machine , Add Adjuster, Manage Queue.

Process: Factory Service Simulation Software (FSSS)

Outputs: Get Statistics

3.2 Non-Functional Requirements

Database Requirements: If the no. of machines or adjusters are more, then the size of database will increase proportionally. So, there must be space in hard disk to store the total amount of data which might be more than what was specified in the hardware specifications section.

Legal Requirements : FSSS cannot be distributed freely by anyone as it has a software license agreement.

Availability of FSSS : FSSS will be available as long as the office of the corporation is open and any of the stakeholders is present.

3.3 Report

In this section, the functional requirements of FSSS are explained in detail using data flow diagrams and Structure chart. The DFD graphically represents the "flow" of data through the system. The DFD along with Structure Chart help in visualization of data processing of FSSS.

The Non-functional requirements are also discussed which ensure an operable and manageable system which functions uninterrupted and in a reliable fashion.

4.0 Detailed Design

4.1 Global System Architecture

The system architecture is a 2-tier architecture which includes the stakeholder at one end and database at the other end. There is no server based middle tier used in the software.

4.2 Platform

Minimum system requirements:

Hardware Requirements:	
Operating system	Windows 7/XP or later versions, Linux
Processor	Pentium III processor or equivalent
Hard Disk space	500MB
RAM	512 MB

Recommended system requirements:	
Hardware Requirements:	
Operating system	Windows 7/XP or later versions, Linux
Processor	Pentium IV processor or above
Hard Disk space	500MB
RAM	1 GB

4.3 Software Architecture

Object-Oriented architecture is the basis of FSSS. The data representations and their associated operations are encapsulated in an abstract data type or object. Objects interact through functions. The object is responsible for maintaining the integrity of its representation.

4.4 Report

In this section, the global system architecture and the minimum and required hardware and software requirements were mentioned. The software architecture of the software was also discussed.