FACTORY SIMULATION SOFTWARE

SOFTWARE ANALYSIS and STRUCTURED DESIGN (SA/SD)

Table of Contents

1.0 Introduction

1.1 Purpose

This document captures the details of the structure of the Factory Service Simulation Software (FS) by providing a complete description of all its functions and specifications developed for determining the machine utilization and adjuster utilization of a Factory.
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 Software makes the job of the Service Manager by assigning adjuster to each of the machine which fails in a way, which maximizes the utilization of both machines as well as adjusters. By maximizing the user's work efficiency the system will meet the user's needs while remaining easy to understand and use. This Software helps in determining the reliability of each machine in the factory by calculating Mean Time To Failure(MTTF) and hence helps the Service manager to identify the number of adjusters need to be maintained by him.

1.3 Glossary

FS - 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 - Feasibility study enables us to determine the feasibility of developing the software by analyzing Stakeholders and various other

functionalities.

Section 3 - Requirements analysis wherein we identify the requirements of the FS Software viz; Functional and Non-Functional Requirements.

Section 4 -Detailed Design, where Architecture of the System and Software is defined and the various platforms which supports the operability of the FS Software.

2.0 Feasibility Study

2.1 Understanding the Problem

FS 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

The scope of the problem is to assign a machine which failed to the next available adjuster that is in the front of the idle adjusters queue, to assign an adjuster by the Service Manager to the failed machine, adjuster repairing the machine assigned to it and getting the maximum utilization of both machines and adjusters.

2.3 Analyzing the Stakeholders

There are a set of registered people in the system, Adjusters, Service Manager and Head of the Factory.

Service Manager: First, the Service Manager logs in the system using his username and password. The Service Manager of factory will be able to access the databases of machines and adjusters and assigns failed machines with adjusters. The Service Manager could update the queues of machines and adjusters each time some task gets completed.

Adjuster: The Adjuster logs in the system using his username and password. Adjusters repair the failed machine assigned to him by the Service manager.

Head of the Factory: The Head logs in the system using his username and password. Then, Head analyzes statistics which includes Machine Utilization and Adjuster Utilization.

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.

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

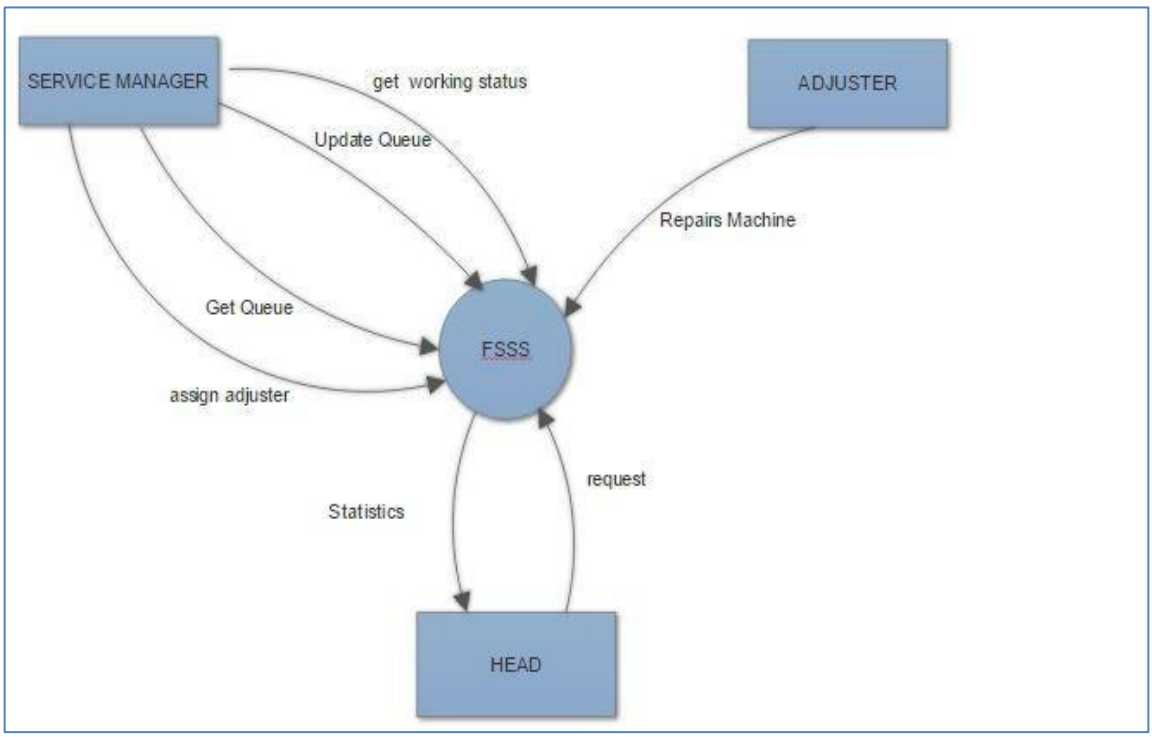
In the present section, we went through the various details of the problem statement. The objectives and scope have been presented in detail. Then, the roles of different stakeholders were analyzed. The alternatives were developed while noting the cost and lifetime of the parts the alternative brings.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

Context Diagram

The FS 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 (FS) Outputs:

Get Statistics

3.2 Nonfunctional 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: FS cannot be distributed freely by anyone as it has a software license agreement.

Availability of FS: FS will be available as long as the Factory Office is open and any of the stakeholders is present.

3.3 Report

In this section, the functional requirements of FS 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 FS.

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*

4.0 Software Architecture

Object Oriented architecture is the basis of FS Software. 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.

4.1 Report

In this section, the global system architecture and the minimum hardware and software requirements are mentioned. The architecture of the software is also discussed.