

Software Requirements Specifications for

Road Repair and Tracking Software

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► 1. Introduction

► 1.1 Purpose

This document provides guidelines for the development of an automated Road Repair and Tracking Software. This is intended for the Software Developers to gain a deeper insight regarding the requirements and the specifications of the system. It explains the functional features of the software, the different interfaces available for different categories of users.

Stating these requirements insure that any potential misunderstandings are dealt with at an early stage. In case of existence of such discrepancies between the intention of the customer and the understanding of the Software Developer, suitable modifications are made so that the SRS meets the customer's requirement.

► 1.2 Document Conventions

In this whole document key points are written in bold faces with the same font as the text and no other conventions have either been adopted or followed.

RRTS - Road Repair and Tracking Software

► 1.3 Intended Audience and Reading Suggestions

- Software developer
- Administrator
- Salespersons of the system
- Users of the system (Clerk, Supervisor, Administrator, Mayor of the city)
- Security Analysts
- Maintenance Team

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► 1.4 Project Scope

The Road Repair and Tracking System (RRTS) Software is designed to automate the various book keeping associated with the road repairing task of the Public Works Department of the Municipal Corporation of a large city.

► 1.5 References

1. SE_SRS Template___ (Provided by Prof. Partha Pratim Das)
2. IEEE_Std_830_1998___Recommended_Practice_for_SRS

► 2. Overall Description

► 2.1 Product Perspective

The Road Repair and Tracking software aims at automating various bookkeeping activities associated with road repairing tasks of a Public Works Department of any corporation of a large city. It is an extension of the manual work done by the clerks in the registration and action of the road repair complaints given by the residents of the city at the head office of the corporation.

It is an independent self-contained product.

► 2.2 Product Features.

The major objective of RRTS is to automate the road repairing of the city which was done manually by the clerks. This is done as there can be multiple records of the database and the manpower required will be less as most of the work is done by the software (For example: the scheduling of the manpower and the machinery which was earlier manually is now automatically done by the software, thus reducing the required hours of work) and also there will be less opportunities for ambiguities as the system uses a tested algorithm for assigning the manpower and machinery.

The following Use-cases are given for the four main users of the software: Clerk, Supervisor, City Corporation Administrator and the Mayor.

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1. Clerk:

Use-case: Register Complaint

- The clerk registers the written complaints and repair requests, raised over phone calls, letters or personally by various citizens.

Use-case: Print Area-wise fresh Complaints

- The clerk prints the area-wise list of fresh complaints every morning to be made available for all the

2. Supervisors

Supervisor:

Use-case: Assign areas

- Every day each Supervisor is assigned areas he is supposed to visit and inspect that day.

Use-case: Get Area List

- A list is generated for the Supervisor to assist him in efficiently completing the day's tasks. The list contains details of areas he is supposed to visit, information about the respective localities and the repair requests raised. The list is printed out to him via a printer.

Use-case: Rate Severity of Complaint

- After examining the locations where requests for road repairs have been raised, the Supervisor confirms the severity of the problem and depending upon the extent of damage and the type of locality the Supervisor assigns a priority to the request.

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Use-case: Resource Estimation

- The Supervisor estimates the number of and the types of machines and personnel required for the task. He also estimates the time within which the repair would be done.

Use-case: Get Schedule Report

- After entering the data regarding the priority of the requests and the resources required depending upon the availability of personnel and machines and the urgency of the task RRTS generates an optimal schedule for the tasks to be performed. This is done automatically by the system and the schedule of the repair works is printed out to the supervisor.

City Corporation Administrator:

Use-case: Update Information

- The City Corporation Administrator enters/changes information about the types and number of machines, equipment available and the amount of the raw material available for the repairs and also the number and types of personnel available into the database. The manpower and machinery available/committed are displayed for the knowledge of the Administrator. Once the information is updated, then the schedule of the repairs is also updated depending on the available manpower and machinery after the update.

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Mayor:

Use-case: Request Statistics

▫ The Mayor of the city can request for various types of statistics regarding road repair tasks such as the number and types of repairs carried over a time period, the repair work outstanding at any point of time, utilization statistics of the repair manpower and machinery over a time period.

► 2.3 User Classes and Characteristics

There are a set of registered people in the system.

- Clerks working in the various branch offices
- Supervisors of various areas
- City Corporation Administrator
- Mayor

Each one of them may have some exclusive privileges. There will be login protection for each type of user to protect the privileges extended to them.

► 2.4 Operating Environment

HARDWARE REQUIREMENTS

- Processor : 800MHZ Intel Pentium III or equivalent
- Hard Disk : 750 MB of free disk space
- RAM : 512 MB RAM

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SOFTWARE REQUIREMENT

- Operating System: Windows XP,7,8,8.1,10, Ubuntu 12.10+

- ▶ 2.5 Design and Implementation Constraints

- Language: English is the only medium of instruction.

- Only a single copy of the database is maintained and hence the data is prone to loss due to digital and physical calamities.

- No two layer security is provided if the passwords of any of the user is compromised.

- The priority of the repair work to be done is solely dependent on the supervisor and hence is susceptible to corruption and is dependent on the fairness of the supervisor.

- The software works only in Windows/Linux based environments.

- ▶ 2.6 User Documentation

- As this software utilizes a simple Graphical User Interface (GUI) consisting mainly of buttons and text fields, very little in depth knowledge is required and almost anyone with a basic understanding of a computer can use it.

- ▶ 2.7 Assumptions and Dependencies

- Though this is an efficient software, certain assumptions and limitations have been made such as the number of areas in the city and correspondingly the number of supervisors. The assumption that the repairs are prioritized according to the scale of 1-10 is qualitative and helps to schedule the high priority repair works first. Another assumption that has been made is that the users have the knowledge of their usernames and passwords, there has been no option to recover the password if it is forgotten by a stakeholder.

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▶ 3. System Features

▶ 3.1 System Features table

Screen name Description

1. Welcome Screen

1.1 Clerk Login Button

1.2 Supervisor login Button

1.3 City Corporation Administrator login Button

1.4 Mayor login button

1.1 Clerk login 1.1.1 Register Complaints

1.1.2 Complaints list

1.1.3 Delete Complaints

1.1.1 Register Complaints

- ▶ a) Includes details of repair request/complaint.
- ▶ b) Includes details of the location.

1.1.2 Complaints list

- ▶ a) Details of complaints registered by the clerk on that particular day are displayed
- ▶ b) Each complaint has a number assigned to it.
- ▶ c) There is a print button to print fresh area-wise complaints daily

1.1.3 Delete complaint

- ▶ a) Can enter the number of the complaint and delete it from the database

1.2 Supervisor login

1.2.1 Get Area List button.

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1.2.2 Confirm Complaint Priority of repair on a scale of 1-10.

1.2.3. Estimate Resources a) details of number and types of personnel required

b) details of number and types of machinery required

c) estimated time to complete the task

1.2.4 Get Schedule report Details of when the work related to each repair will be started and details of personnel and machinery allocation.

1.3 City Corporation Administrator

login

1.3.1 Enter/Update Machinery/personnel data

1.3.1 Update machine/personnel data

1.3.1.1 Name, details and type of Personnel

1.3.1.2 Type and details of Machinery

1.3.1.3 Amount of Raw Material

1.4 Mayor login

1.4.1 Road repair Statistics

1.4.2 Resource Statistics

1.4.1 Road repair Statistics

1.4.1.1 Over a time period

1.4.1.2 Particular time

1.4.1.1 Over a time period

► a) Details of number and types of repairs carried out in the time interval

► b) Area wise Statistics

1.4.1.2 Particular time Details repair works under progress at a particular time

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1.4.2 Resource statistics 1.4.1.1 Over a time period

1.4.1.2 Particular time

1.4.1.1 Over a time period

- ▶ a) Details of machinery and personnel allocated to various repair works over a period of time.
- ▶ b) Area-wise statistics

1.4.1.2 Particular time Details of machinery and personnel allocated under different areas at a particular time.

▶ 3.2 System Features

▶ 3.2.1 Welcome Screen

The system has a welcome screen with four buttons which give access to different types of users to different levels of data.

1. Clerk Login Button
2. Supervisor Login Button
3. City Corporation Administrator Login Button
4. Mayor Login Button.

▶ 3.2.2 Clerk Login

1. Contains two text fields for the clerk to enter his unique username and password.
2. A submit button is present which helps him login into the system
3. After clerk logs into the system text fields are present for registering complaints. They include address of location, repair request.
4. Display Complaint List button is present which enables the clerk to see the list of various complaints he has registered that particular day. In the list each complaint has a number assigned to it.
5. Delete complaint button is present and also a corresponding text field is also present. The clerk can enter the number of complaint in the list and hence delete the complaint from the database.

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► 3.2.3 Supervisor Login

1. Contains two text fields for the Supervisor to enter his unique username and password.
2. A submit button is present which helps him login into the system
3. After the Supervisor logs into the system there are four buttons present on the screen.
4. Get Area List Button: Displays the list of areas which the supervisor has been allocated for the day and the various locations he is supposed to visit and examine.
5. Confirm Complaint Button: Confirm complaint button has one corresponding text field and a slider in the range 1-10 along with it. The text field is for the complaint number and the slider is to fix the priority of the complaint. 1 corresponds to maximum priority and 10 corresponds to minimum priority.
6. Resource Estimation Button: Text fields appear, to enter the complaint number and the number of personnel and machinery of required of each type. Estimated time for the completion of the task is also entered.
7. Get Schedule Report Button: Generates a schedule report in which the repairs are organized according to the availability of resources and priority of the task.

► 4. External Interface Requirements

► 4.1 User Interfaces

- Initially, all users will have the same interface and the interface will differ after the corresponding user logs in to his corresponding part of the software.
- The options a user will have after he logs in to the software are specified in detail in the preceding sections.
- Only a mouse and keyboard are required for the user to interact with the system.

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► 4.2 Hardware Interfaces

- Hardware: Personal Computer or Laptop etc., Printer, Mouse, Keyboard
- Operating System: Windows XP,7,8,8.1,10 or a Linux system
- Internet Connection: Either a LAN connection or a WIFI connection is preferable

► 4.3 Software Interfaces

- The software will be coded in Java NETBEANS v7.4 editor and no other software is required.

► 4.4 Communications Interfaces

- No other communications interfaces are required.

► 5. Other Non-Functional Requirements

- No additional requirements

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Appendix A: Glossary

Term and their Definitions

Database ::

Collection of all the information monitored by this system.

Software Requirements Specification::

A document that completely describes all of the functions of a proposed system and the constraints under which it must operate. For example, this document.

User/Customer::

Customer(s) of the software is(are) the person(s) for whom the software has been designed and those who avail the service provided by the software

Complaint::

A mechanism for the Corporation to identify the road whose repair is needed. It's location is given in the registered complaint