
Software Requirements Specification

for

Road Repair and Tracking Software

Version 1.0 approved

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Revision History

Name	Date	Reason For Changes	Version
Road Repair and Tracking Software	19.03.2020		1.0

1. Introduction

1.1 Purpose

The purpose of this software is to automatically schedule the repair of the road depending up on the priority of the repair work and subject to the availability of raw material, machines, and personnel so that the limited resources of the city could be used in most efficient manner. This SRS describes the entire behavior, functions and specification of the RRTS.

1.2 Document Conventions

There are no document conventions as such. Any person reading the document should be easily able to understand its contents.

1.3 Intended Audience and Reading Suggestions

The document is intended for the developers, project managers and Public Works Department of the Corporation of a large city who wish to view the system requirements and specifications. The rest of the document has been categorized into

- overall description
- functional requirement,
- non-functional requirements
- goals of implementation.

1.4 Product Scope

The purpose of this software is to schedule the repair of the roads in a city depending up on the priority of the repair work and subject to the availability of raw material, machines, and personnel for the Public Works Department of the city Corporation so that the limited resources of the city could be used in most efficient manner. The system will also assist the Department to maintain and monitor the available resources for road repair and schedule repair tasks accordingly.

1.5 References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specification.
IEEE Computer Society, 1998.

2. Overall Description

2.1 Product Perspective

Road Repair and Tracking software is a self-contained software which can be used in the multiple branches of a Works Department of the city Corporation. In a city where the number of daily complaints are substantially high this software helps the city Corporation in tracking the unresolved complaints over the anomalies of city roads and plan a schedule to repair them efficiently. This software will not only reduce man power used to a plan a proper repair schedule city Corporation but will also decrease manual errors which could occurred while planning and also increase the efficiency of the use of city Corporation resources.

2.2 Product Functions

The following functions are provided by the software:

- Complaint creation
- Update complaint
- Scheduling Repair
- Update Resources
- Generate Statistics

2.3 User Classes and Characteristics

The Software has the following user classes:

Clerk: Registers a complaint along with specific details and a short description.

Supervisor: Prioritizes the filed complaints and estimates the amount of resource needed for the completion of work and has access to the schedule.

Administrator: Update the resource availability data and modify the number of active personnel and machinery available.

2.4 Operating Environment

Operating System: Ubuntu, Windows 7,8,10

Language: Python

2.5 Design and Implementation Constraints

The password for clerk, supervisor and administrator can be set only once at the start of the program.

The number of branches in the city is fixed and cannot be changed dynamically.

Advanced security measures have not been implemented to protect the database.

2.6 User Documentation

License and User Manual will be provided along with the software.

2.7 Assumptions and Dependencies

The user must be familiar with the use of the software.

The Device running this program should have all the necessary and compatible softwares to run.

3. External Interface Requirements

3.1 User Interfaces

Road Repair and Tracking Software incorporates an interactive graphic user interface which is user friendly. Interface mostly consists of buttons and checkboxes which helps people to lodge complaints easily and precisely in detail, which also helps supervisors to prioritize repair works accordingly. Any warnings and errors will be displayed using dialog boxes.

Upon running the software, the user is presented with three types of logins through a graphic interface in the name of Clerk, Supervisor, Administrator.

- Clerk login
 - >Upon choosing clerk login, the user will be asked to enter his user id and password.
 - >Once the user is successfully logged in, he will be presented with an interface containing all the functions that he can perform.
 - >Users can record the complaint raising the repair request for a road clearly mentioning the name of the road, exact location where the problem has occurred and a brief description of the problem that is associated with the road that the user wants to bring to the notice of the officials.
- Supervisor login
 - >Supervisor will be asked to enter his user id and password and is needed to enter login credentials to have access.
 - >supervisor can record the data regarding severity of damage to roads including the priority order of their repair work and the exact requirement of resources like manpower, machines, raw materials.
- Administrator login
 - >Administrator also is also presented with the same options for login and is needed to enter login credentials to have access.
 - > Administrators can update the resource availability data at any time. They can update and modify the number of active personnel available and machinery that is in good shape and working.

3.2 Hardware Interfaces

This software is supported by a laptop or computers and doesn't need very heavy hardware requirements. The system comprises users who are spread over in a city/town and is analogous to connected through intranet.

The minimum hardware requirements for this software are a 2.2 GHz CPU and 4 gigabytes of RAM.

3.3 Software Interfaces

This software requires Python to be installed on the system, more specifically Python 3. Additional software interfaces used for the development of this product include:

BACK END:

Road Repair and Tracking Software will interface with a Database Management System (DBMS).

The databases will be used store the information regarding Complaints lodged by the people of the city and store the personal information of clerk, supervisors and administrator and the status of the resources available.

FRONT END:

The user interfaces will be created by python GUI.

MIDDLE-WARE:

The middle tier of this software is developed using Python.

4. System Features

This subsection provides details about the identified functional requirements of the software

4.1 Register Complaint

4.1.1 Description and Priority

Record the complaint by the user raising the repair request for a road clearly mentioning the name of the road, exact location where the problem has occurred and a brief description of the problem.

4.1.2 Stimulus/Response Sequences

A user has to login into clerk account in order to access this feature of the software. A new clerk should create a new account.

4.1.3 Functional Requirements

Req-1: Ask for user details like name of the road, location, nearest Public Works Department branch and description of the problem.

Req-2: Allocate space in the server memory for complaint.

4.2 Update Complaint

4.2.1 Description and Priority

Update the complaint by adding extra attributes regarding severity of damage to roads including the priority order of their repair work and the exact requirement of resources like manpower, machines, raw materials from the supervisors. He can also deny the work order for the complaint if found to be a false complaint.

4.2.2 Stimulus/Response Sequences

A user has to login into supervisor account in order to be able to update a complaint.

4.2.3 Functional Requirements

Req-1: Ask for user details like damage severity, priority, and resource requirements.

4.3 Update Resources

4.3.1 Description and Priority

Update the resource availability data at any time from the administrators.

4.3.2 Stimulus/Response Sequences

A user has to login into administrator account in order to update resources.

4.3.3 Functional Requirements

Req-1: Ask for user details amount like manpower, machines, raw materials available.

4.4 Schedule Repair

4.4.1 Description and Priority

Process the complaint list of roads in various areas from users and generate a list of damaged roads for the supervisors to inspect by allocating the workload based on geographic area to the supervisors and Analyze the priority order of repair work and optimally decide a schedule for the work taking into consideration the availability of resources.

4.4.2 Stimulus/Response Sequences

A user has to login into supervisor account in order to access the repair schedule.

4.5 Generate Statistics

4.5.1 Description and Priority

Retrieve and generate the statistics for the overall status of work completed or outstanding including data like number of roads repaired and the resource usage for any particular work like material cost, manpower, machines etc..

4.5.2 Stimulus/Response Sequences

A user has to login into administrator account in order to access account in order to generate statistics.

4.5.3 Functional Requirements

Req-1: Data about the work status is retrieved from the supervisors.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- >The product requires access to different databases.
- >The response time of the software should be less than 2 seconds most of the time.
- >Response time refers to the waiting time while the system accesses, queries and retrieves data from the databases.
- >The performance depends on hardware components.
- >The software shall show no visible deterioration in response time as the number of users or detail schedule data increases.

5.2 Safety and Security Requirements

- >Only the administrator has the right to manage and make changes to the resources parameters such as machinery and number of personnel available. The system is secure and will protect the database.
- >Users need to be authenticated before having access to schedule.

5.3 Software Quality Attributes

Availability:

Road Repair and Tracking Software will be available 24 hours a day, 7 days a week.

Correctness:

Road Repair and Tracking Software shall provide real time data about the repairs going on around the city.

Maintainability:

Various versions of the product should be easy to maintain. For development it should be easy to add new code to the system, modify the existing code or incorporate new features to the software.

Robustness:

The software shall be robust enough to have a high degree of fault tolerance. For example, the system should not crash if the user enters an invalid input. It should display a suitable error message.

Usability:

Road Repair and Tracking Software shall provide an easy way to use graphical interface similar to existing complaint lodging portals so that users don't need to adapt to new interface features. The interface should be interactive and easily navigable. Users should be able to understand the menu and other features of the software. Any error message displayed by the software shall be polite and clear.

5.4 Business Rules

This software should be used only after a proper contract agreement with the company developing it. In case of any problems the user should immediately contact the project manager. The software should not be outsourced to any third party without prior permission.

6. Other Requirements

Licensing requirements: Applicable

Legal, Copyright and Other notices: All rights reserved by our organization.

Applicable Standards: It should be as per the industry standards