Military Institute of Science and Technology

Department of Computer Science & Engineering

CSE – 360 (Integrated Design Project)

SYSTEM REQUIREMENTS SPECIFICATION(SRS)
Version 0.0

For

DIGITAL LOGBOOK MAINTENANCE SYSTEM (DLMS)

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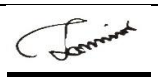
3.	*201714103*	*Tanvir Nahian Swapnil*	zabulanakakil@gmail.com	
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Table Of Contents ..... *Page ii*

Preface

Bangladesh Army is one of the most traditional military organizations of the world. We follow the rules and regulations that are being in practice over a long period of time. Like the vehicle logbook maintenance system. From the beginning they are being maintained in a logbook which is a hardcopy. Hardcopies have a wide range of disadvantages. Some of the which are the preservation of them over a long period time, security issues, quick response in workshop. Moreover, the main task of an army in peace time is to prepare for war. Considering the crisis moments, the logbook is an important piece of document but very vulnerable. In the wrong hands, passing down information about it to the enemy will result in a great harm for us. As by vehicles we include tanks, APCs, artillery guns, pickups, jeeps, 3 tons and everything else, which play significant roles in war.

Now with the advancement of technology we are going to improve the system as many of the military organizations of the developed countries are following. We will not only remove this hardcopy from the system but also to get the full advantage and well responsive system we will be building an entirely new technology-based system for us. This will result in requirement of less man power, more time efficient and will have a clear record of all the vehicles along with full security, authentication of any work permits as well as will have the updated response on the progress on any work in the workshops.

As a result of our new system we can have a full secure system, the responsible officers can easily monitor all the progressive works of all the vehicles which will save time and can also plan easily on the vehicles that need to be repaired or maintained with high priority.
Hence our system will greatly facilitate our army and we will have technological advancements in this field which we still don't have.

1. Introduction

1.1. Purpose

The current system prevailing for logbook maintenance is ages old with many loop holes. It works slow, more man power is required and the system lacks proper authenticity and security along with information confidentiality. DLMS will improve our existing system in all possible ways. Currently we will be pin pointing all the problems and disadvantages we face due to the prevailing system in details then along with the digitalization of the system we will focus on the weak spots of the prevailing system and build the DLMS considering those flaws and will strengthen the system.

1.2. Document conventions

Throughout the SRS we have used bold words as headings. sub headings are also written in bold along with number. Further sub headings are written in plain number.

1.3. Intended audience and reading suggestions

The project is a prototype for DLMS and should be strictly confined within the instructors of MIST and military personals only. DLMS will be build and developed under the guidance of our instructors in MIST. As we will be dealing with a prevailing system of military organization, including the loop holes and flaws of the system along with ways and means of improving them so it will be best if the SRS of the project remains confined with these limited audiences.

1.4. Project scope

DLMS will be used in the base workshops for the maintenance of the vehicles, all the necessary data of every individual vehicle, of every unit
in the garrison will be in account, about the previous history of repair, changing of parts or routine checkups with every minute details or observations will be kept into account. Even the next dates of changes of parts or cleaning or maintenance dates will also be shown. Moreover, if there is any change of parts, we will have a specific code on all the parts to keep in account which part is going for which vehicle in particular. But most importantly everything will undergo a secured process with the authorized personnel appointed for this task. Then again there will be verification of the vehicle that comes to the workshop with or without proper authority. Just by scanning the BA number of the car we will be able to get all this information. The present system does everything in hardcopies, we will be digitalizing them and giving them limited access through responsible personnel only. Hence, we will be able to mitigate all the drawbacks of the prevailing system.

2. *Glossary:*

a. FWC:

Field Workshop Company is a unit present in every division of Bangladesh Army which gives support in aspects of inspection, repair, recovery of the vehicles, arms and ammunition and supply spare parts as required.

b. QM:

Quarter Master is a vital appointment in a unit ensures receive, maintenance, storage and demand of ration, forage, clothing, equipment, arms and ammunition etc. of a unit.
He also performs the duty of MTO if no MTO is authorized.

c. MTO:

Mechanical transport officer is the officer responsible for Mechanical transports of a unit in fact all type of vehicles.

d. Workshop officer:

Workshop officer is the appointment of a field workshop company who supervises all kind of repair and other activity of the workshop.

e. Logbook:

Logbook is a book containing each and every history of a vehicle or other equipment including arms and Artillery guns or tanks. It contains issue date from CMTD, any kind of repair history, spare parts issued, parts changed, tyre changed, oil & filter change, KMPL and also data of annual inspection and must be signed and closed by workshop officer.

f. RI & I:

It is the vital section of a workshop where a vehicle or equipment is received while entering into the workshop for repair. It means Receive, Issue and Inspection.6 persons are authorized in RI & I who performs all kind of entries in logbook.

g. Work Order:

Work order is the form opened by unit signed by QM before sending any equipment to workshop for repair.

h. Job Card:

When work order is deposited to RI & I, a job card is opened against it. It contains the details of parts required, repairs done to that vehicle or equipment and duly signed by workshop officer.

i. Workshop NCO:

Workshop NCO is responsible for conducting repair procedure of the vehicle or equipment coming to workshop by sending it to respective section and supervising the procedure.

j. BA NO:

BA no is the unique identification no given to every vehicle, small arms, equipment, tanks and artillery guns of Bangladesh Army. A number plate is attached to every vehicle showing respective BA no.

k. 2FA:

Two factor authentication is a way to verify a user's identity before granting login access. When logging in, two factor authentication requires the user to prove their identity in two different ways. There are many methods of authentication like via push notification, SMS passcode, phone calls, tokens and more.

l. DCE:

Data communication equipment are the hardware interface and ard for modems, protocol converters and other communicational equipment. To interface DCE devices with DTE (Data terminal Equipment) devices such as terminals or PCs, a straight through serial cable is required.

m. Decoder:

As part of a bar code reading system, the electronics that process the signals from the scanner, interpret the signals into meaningful data, and control the interface to other devices.

n. Asynchronous Communication:

Also referred to as start/stop transmission. Every character transmitted has special bits attached, telling the receiving device when the data begins and ends. Data is transmitted independently with no associated clock. See also Synchronous communication.

n. Scanner:

A scanner is an input device that scans documents such as photographs and pages of text. When a document is scanned, it is converted into a digital format.

This creates an electronic version of the document that can be viewed and edited on a computer.

o. **SUI:**
The Server User Interface is the interface to the file storage system (whether it is the normal file system, a database, or other versioning repository) that stores the information that is passed through the user interface.

p. **Bitmap:**
A bitmap is a digital image composed of a matrix of dots. When viewed at 100%, each dot corresponds to an individual pixel on a display. In a standard bitmap image, each dot can be assigned a different color.

3. *Overall Description*

a. Project Objective: To build a device which can identify any mil vehicle, a scanner to scan the barcode in any spare parts of vehicle and a software that contains a database linked with the devices.

b. Product Perspective: the DLMS will be a standalone project. the prevailing system of maintaining a logbook will completely be replaced by this project. We are still not having any such system in our force.

c. Product Functions:

- Asks for dual authentication in workshop
- Can identify any mil vehicle
- Requires authentication to access
- Shows all details about the vehicle
- Takes accounts of the parts assembled in the workshop
- Stores the updates in the logbook of the vehicle
- Shows the next date for maintenance of various parts of the vehicle

d. User class:

- QM will use the project to give authentication for the vehicle under his supervision for going in workshop, see the work progress and condition of the vehicles under him.

- Workshop Officer will use the project to supervise and monitor the overall process in the workshop including dual authentication.

- Workshop NCO will identify the vehicle and scan the parts that will be used in the vehicle including the maintenance work.

- RI & I will update the logbook according to the report of the workshop NCO and the process will be verified by the Workshop Officer.

e. Operating Environment:

Our project will mostly be used in the workshop then in the office of QM, Workshop Officer, Workshop NCO and RI&I. other than the office of these people it is very less likely to be used elsewhere.

4. *Requirement Elicitation Process:*

4.1. Requirement Discovery

a. We did not find any specific journals or papers that is similar to maintaining a log book therefore this idea was unique and we had to find out solutions by ourselves.

b. The idea of transforming a manual data to digital data was found and this will be done through database management.

c. To gain on ground knowledge of how the process actually works we went to visit the nearby workshop and saw how a logbook is maintained and how the vehicle is maintained and what are the things done during a maintenance project.

d. We talked with the RI&I and workshop officer and asked for their difficulties and suggestions therefore we got our main requirements from them.

e. We then talked with the QM of 11 Signal Battalion and asked him how on the QM's part a vehicle is maintained that actually is on ground maintenance.

Since the project is very unique and limited to very few individuals therefore we did not go for any survey rather the face-to-face interaction game much more information than expected and we are able to discover all necessary requirements.

4.2. Requirement Classification and organization

a. Dual Authentication checking process so that security is not breached.
b. Smart Image processing system to identify the cars identity.
c. Unique code generator and scanner to get the individual number for every replaced parts.
d. Feedback mechanism for the fluency of the process.
e. Transformation of analog data to digital data.
f. Database updating system

5. User Requirements

Through requirements Discovery process we have found the following requirements:

a. The App and website should be user friendly.
b. The App should be highly secured.
c. The App should be portable in mobile devices
d. The App should have access for Read-only purpose
e. User should be able to update the database easily.
f. User should be able to identify wrong data or any case of misuse
g. User feedback to continue process.
h. There should be a Master-Computer to control every action directly in case of emergency.

6. System Architecture:

7. System Requirements Specification

7.1 *System Requirements:*

7.1.1. Image Processing

The image of the vehicles identifying number that is BA Number will be taken and processed to get access to that vehicles individual logbook.

7.1.2 Authentication approval

QM of the unit the vehicle is from will be given access to all the vehicles he owns log book and will be only able to read information and allow it to go for repair. This authority will be required to be taken from the workshop officer for the concerned QM via any mailing system. QM's personal Gmail account will be used to verify his authenticity and signing up.

7.1.3 Authentication checking

When a new vehicle approach for repair the authority of that repair should be checked from the QM's permission in order to avoid unwanted incidents. Without proper authority no vehicle should be repaired.

7.1.4 Barcode Generation and Scan

As the vehicle is being repaired new parts will be transplanted and older ones will be removed. Now which part and how many are changed will be hard to recognize just by names therefore a barcode generation system will be used on the part to label them and a scanner will be used on only those parts that are going to be used for this repair purpose.

7.1.5 Job card updating

Since all initial data of the repairs will be placed in the job card first therefore the updating of the job card should be able to be done form multiple devices. Several job cards can be kept open at the same time and can be updated at the same time.

7.1.6 Feedback

There will a feedback mechanism via email and mobile message to know the completion of the maintenance of any vehicle. Therefor the workshop officer can anytime verify it.

7.1.7 Overall supervision

The workshop officer will get the authority to make any ongoing job pending or speed up the process or even can cancel process. Again he can check back any job already done and passed to him for confirmation. He will give authority for a vehicle to return back to unit via confirming or accepting the job card.

7.1.8 Updating database from Job Card

Job cards information will be collected automatically from server and the log book will be auto filled up from the given updated fields of the job card

7.2 Requirement Classification

Serial	***User Requirements***	***Types of Requirements (functional)***	***Types of Requirements (Non-Functional)***
1.	The App and website should be user friendly	√	√
2.	The App should be highly secured	√	√
3.	The App should be portable in mobile devices	√	X
4.	The App should be able to be read-only purposes	√	X
5.	User should be able to update the database easily	√	X
6.	User should be able to identify wrong data or any case of misuse	√	X
7.	User feedback to continue process	√	X
8.	There should be Master-computer to control every action directly in case of emergency	√	X

8. System Model:

8.1. Context Diagram:
8.2. Use Case Diagram:
8.3. Activity Diagram:
8.4. Sequence Diagram:

9. System Evolution: