<Transport Company SW>

Software Requirements Specification

Team “Number One”

Version 0.1

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1. Introduction

1.1. Purpose

The purpose of this document is to provide a full description of a Transport Management System. A Transportation Management System is a software system which is

created to manage transportation operations and ensure better service. Program should decrease transportation time, fuel cost and increase customer satisfaction.

1.2. Document conventions

When writing this SRS, the following terminologies are used:

- **TCP** - The Transmission Control Protocol is one of the main protocols of the Internet protocol suite.
- **FIFO** - an acronym for first in, first out, a method for organizing and manipulating a data buffer, where the oldest (first) entry, or 'head' of the queue, is processed first.
- **GSM** - is a standard developed by the European Telecommunications Standards Institute to describe the protocols for second-generation digital cellular networks used by mobile devices such as mobile phones.
- **NFC** - Near-field communication is a set of communication protocols that enable two electronic devices, one of which is usually a portable device such as a smartphone, to establish communication by bringing them within 4 cm (1.6 in) of each other.
- **GPS** - The Global Positioning System is a space-based radionavigation system owned by the United States government and operated by the United States Air Force.
- **RFID** - Radio-frequency identification uses electromagnetic fields to automatically identify and track tags attached to objects.
- **QR code** - a machine-readable optical label that contains information about the item to which it is attached.
- **BSON** - BSON /ˈbiːsən/ is a computer data interchange format used mainly as a data storage and network transfer format
- **JSON** - an open-standard file format that uses human-readable text to transmit data objects consisting of attribute–value pairs and array data types (or any other serializable value).
- **Socket** - an end-point in a communication across a network or the Internet
- **HTTP** - Hypertext Transfer Protocol is an application protocol for distributed, collaborative, and hypermedia information systems.
- **COM** - name of the serial port interface on IBM PC-compatible computers.

1.3. Contact information/SRS team members

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2. Overall Description

2.1 Product functions

1. Monitor and track parcels lifecycle
2. Monitor and track delivery operation
3. Monitor traffic and critical conditions and provide warning and alternatives
4. Manage criticality and accidents involving delivery
5. Generate activity reports
6. Define operators schedules and turnover
7. Monitor and reporting on stocking areas

2.2 User classes and characteristics

1. International and local manufacturing companies.
2. Legally capable population from 16 to 60+ age with e-wallet.
3. Truck drivers as employees.

2.3 Operating environment

Base: Main Control room with 3 servers, 20 PC based stations with multiple screens. Local High speed bus.

3 Level 2 Control rooms 2 servers 5 PC based stations stations with multiple screens. High speed COMs (Fiber) with Main CR.

500 remote terminal (Android). 4G (up 60%), GSM (up 95%), 50 terminal have parallel Satcom.

2.4 User environment

Web client based on WEB 2.0, Android and Desktop application.

2.5 Design/implementation constraints

The challenges in developing this product consist the most in the limitation of the internet speed on remote terminals. Due to the speed of GSM 115.2Kbit/s and average speed of satlink of 1Mbit/s + latency of 638 ms we need to delimit the information which will be processed on the server and terminal to send less data to the server. It is required to use some protocols over TCP to ensure data security and data safety. Data will be sent as encrypted text, because binary packets are more expensive in requirements of internet. Sometime wireless internet can not be accessible so, information need to be available offline and synced with the server when internet appear, sync must be in FIFO and timestamped.

Because tracking each package manually is too hard, it will be necessary to mark all packages with unique identifier and to track enter and exit of package from the transport or office. There are multiple methods of fast tracking each package, the best will be to have an NFC reader on the terminals and attach RFID to each package. If NFC is not available or too

expensive for the company there is a solution to print QR codes and attach them to each package and terminal will have a camera to read.

App must do a lot of action automatically, because there are a lot of packages and personal of the company may not be in time to manually input data for each them.

Each terminal must have GPS, so on the map live all products which have status entered into the transport can be tracked and analytics can create estimation on delivery.

3. External Interface Requirements

3.1 User interfaces

User interfaces in both Desktop and Mobile platforms should follow Material Design Principles introduced by Google (https://material.io/).

3.2 Software interfaces

Software interfaces should be standartized to JSON format.
In cases of slow connection it better to use BSON (http://bsonspec.org/) for data compression and GZIP for text compression.

3.3 Communication protocols and interfaces

Communications will be based on HTTP and Socket protocols.

4. System Features

Role	Description
Software User	**All the users of software**
Customer	**Uses transport company services to send or receive parcels.**
Company operator	**Communicates with customers, drivers and company managers. Solves delivery problems.**

Company manager	**Defines employees' schedule and generates activity reports.**
Stock-manager	**Controls filling of a warehouse.**
Driver	**Delivers parcels**

Features:

US-01	**Entering the system**
Description	**As a** Software User, **I want to** enter the system using my personal account **so that** use services of the system
Priority	High
Action/result 1	***Given*** - **Personal account is valid** ***When*** - **The user attempts to enter the system** ***Then*** - **Main menu of the application is shown** - **An acknowledgement message is issued**
Action/result 2	***Given*** - **Personal account is NOT valid** ***When*** - **The user attempts to enter the system** ***Then*** - **Main menu of the application is NOT shown** - **An error message is issued**

1. **Monitor parcels lifecycle**

US-02	**Monitoring operation**
Description	**As a** Customer, **I want to** know the state of the parcel, **so that** I know the state of my order.
Priority	High
Action/result 1	***Given*** - **Track number is valid** ***When*** - **The customer requests tracking information about his/her parcel** ***Then*** - **State of the order is shown** - **Tracking information is shown**
Action/result 2	***Given*** - **Track number is NOT valid**

	When - **Customer requests tracking information about his/her parcel** ***Then*** - **Tracking information is NOT shown** - **State of the order is NOT shown** - **An error message is issued**

US-04	**Monitoring parcels (Company Operator)**
Description	**As a** Company operator, **I want to** track customer's parcel state, **so that** to be able to provide him/her first-hand information.
Priority	High
Action/result 1	***Given*** - **Track number is valid** ***When*** - **Company operator requests tracking information about customer's parcel** ***Then*** - **Tracking information is shown** - **State of the order is shown**
Action/result 2	***Given*** - **Track number is NOT valid** ***When*** - **Company operator requests tracking information about customer's parcel** ***Then*** - **Tracking information is NOT shown** - **State of the order is NOT shown** - **An error message is issued**

2. Monitor and manage traffic and critical conditions, provide warning and alternatives (and accidents)

US-05	**Monitoring Weather**
Description	**As a** Driver, **I want to** receive weather warnings, **so that** I can be prepared for emergency situations
Priority	High
Action/result 1	***Given*** - **Phone geolocation is defined** - **Internet connection is available** ***When*** - **The weather is automatically changed** ***Then*** - **Weather warnings are received**
Action/result 2	***Given*** - **Internet connection is NOT available** ***When*** - **The weather is automatically changed** ***Then***

	- **Weather warnings are NOT received** - **An error message is issued**

US-06	**Changing route**
Description	**As a** Company Operator, **I want to** change current route, **so that** I choose a new convenient route for the driver
Priority	High
Action/result 1	***Given*** - **Driver's geolocation is defined** ***When*** - **The Company Operator changes driver's route** ***Then*** - **Driver's route is changed**
Action/result 2	***Given*** - **Driver's geolocation is NOT defined** ***When*** - **The Company Operator changes driver's route** ***Then*** - **An error message is issued**

US-07	**Monitoring Traffic**
Description	**As a** Company Operator, **I want to** monitor road traffic, **so that** I can show the driver another way to destination
Priority	High
Action/result 1	***Given*** - **Driver's geolocation is defined** - **Entered city is valid** ***When*** - **The Company Operator requests an information about road traffic** ***Then*** - **Traffic information is shown**
Action/result 2	***Given*** - **Driver's geolocation is NOT defined** - **Entered city is NOT valid** ***When*** - **The Company Operator requests an information about road traffic** ***Then*** - **Traffic information is NOT shown** - **An error message is issued**

US-08	Managing Accidents
Description	**As a** Company Operator, **I want to** call the nearest repair center or new truck, **so that** parcels can reach destination on time even in case of accident
Priority	Low
Action/result 1	***Given*** - **Driver's geolocation is defined** ***When*** - **The Company Operator requests a list of the nearest repair centers** ***Then*** - **List of the nearest repair centers is shown** - **Nearest repair centers are shown on a map**
Action/result 2	***Given*** - **Driver's geolocation is NOT defined** ***When*** - **The Company Operator requests a list of the nearest repair centers** ***Then*** - **An error message is issued**

US-09	Receiving shortest way
Description	**As a** Driver, **I want to** receive the shortest way to destinations, **so that** I can deliver parcels on time
Priority	Medium
Action/result 1	***Given*** - **Mobile network is available** - **Starting point and endpoint are entered** ***When*** - **The Driver requests for the shortest way** ***Then*** - **Shortest way is shown on a map**
Action/result 2	***Given*** - **Mobile network is NOT available** - **Start point and endpoint are NOT entered** ***When*** - **The Driver requests for the shortest way** ***Then*** - **An error message is issued**

3. Generate activity reports

US-10	Generating activity report
Description	**As a** Company manager, **I want to** create reports, **so that** I have full documentation about employees and company activities.

Priority	High
Action/result	***Given*** - **Account is valid** ***When*** - **Company manager wants to create a report(press a button "create report")** ***Then*** - **Report template is shown**
Action/result 2	***Given*** - **Account is NOT valid** ***When*** - **Company manager wants to create a report** ***Then*** - **Report template is NOT shown**

4. Define operators schedules and turnover

US-11	**Creating schedule**
Description	**As a** Company manager, **I want to** create employee's schedule, **so that** .
Priority	High
Action/result 1	***Given*** - **Account is valid** ***When*** - **The Company manager wants to distribute working hours between employees** ***Then*** - **Schedule template is shown**
Action/result 2	***Given*** - **Account is NOT valid** ***When*** - **The Company manager wants to distribute working hours between employees** ***Then*** - **An error message is issued**

5. Monitor and reporting on stocking areas (stock-manager)

US-12	**Monitoring goods in stocking areas**

Description	**As a** Stock manager , **I want to** check what is in our stocking areas, **so that** our company can provide the ability to keep customer's parcels there .
Priority	High
Action/result 1	***Given*** - **Internet connection is valid** ***When*** - **The Stock manager requests information about parcels in the warehouse** ***Then*** - **Information table is shown**
Action/result 2	***Given*** - **Internet connection is NOT valid** ***When*** - **The Stock manager requests information about parcels in the warehouse** ***Then*** - **Information table is NOT shown** - **An error message is issued**

US-13	**Changing parcels' state**
Description	**As a** Stock manager, **I want to** change states of parcels in the stock, **so that** customers know it.
Priority	High
Action/result 1	***Given*** - **Internet connection is valid** ***When*** - **Stock manager changes the state of parcel** ***Then*** - **Parcel's state is changed** - **An acknowledgment message is issued**
Action/result 2	***Given*** - **Internet connection is NOT valid** ***When*** - **Stock manager changes the state of parcel** ***Then*** - **Parcel's state is changed** - **An error message is issued**

5. Other Non-Functional Requirements

NFR-01	**Security**
Description	**No one will have an access to any user's account information without a permission except the user itself**

Story Test	• **Test that no one can access the information of other accounts**

NFR-02	**Security**
Description	**Only users with correct login-password or track number will be given access to the system**
Story Test	• **Test access to the system using correct and incorrect login-passwords or track number** • **Calculate the ratio of access that succeed for correct and incorrect login-passwords or track number**

NFR-03	**Performance**
Description	**Users should receive tracking information about parcels in less than 30 seconds after request**
Story Test	• **Test the time spent on displaying tracking information**

NFR-04	**Usability**
Description	**All users should be satisfied with use of the system**
Story Test	• **Test satisfaction among several users that use the system**

NFR-05	**Portability**
Description	**Drivers should be able to use the system on different Android devices**
Story Test	• **Test usability of the system on different environments** • **Calculate the ratio of devices that support the system**

NFR-06	**Availability**
Description	**Users should have an access to the system and all resources all the time**
Story Test	• **Test the time system is available (should be close to 100%)**

NFR-06	**Safety**
Description	**Software should show only valid ways for drivers**
Story Test	• **Test software on showing different ways several times**