



Travel in
Good Health
Management

*Software Analysis and
Software Design Document
SA & SD*

By

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Software Engineering Assignment 4

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1. FEASIBILITY STUDY

1.1 UNDERSTANDING THE PROBLEM STATEMENT

On one side we have train passengers who are unsatisfied with the food provided by the pantry car and on the other we have food suppliers ready to serve them for a price. The project aims to create a bridge between the passengers and the food providers in a way such that the process is formal, deterministic and feasible to both the parties.

1.2 SCOPE

The software supports/performs the following tasks.

- Order placement by customer.
- Notification to agent and customer when necessary.
- Listing of success statistics of routes and agents when required by management.
- Generate receipt for customer once order is confirmed.
- Addition/Removal of trains, routes, food providers when required by the management.
- Accept registration from Food Providers and Agents with ability to upload relevant details.
- Modification of menu by Food Providers.
- View, Accept/Reject registration requests from Food providers and Agents by the management
- Accept/Reject an order placed by the customer as agent wishes.

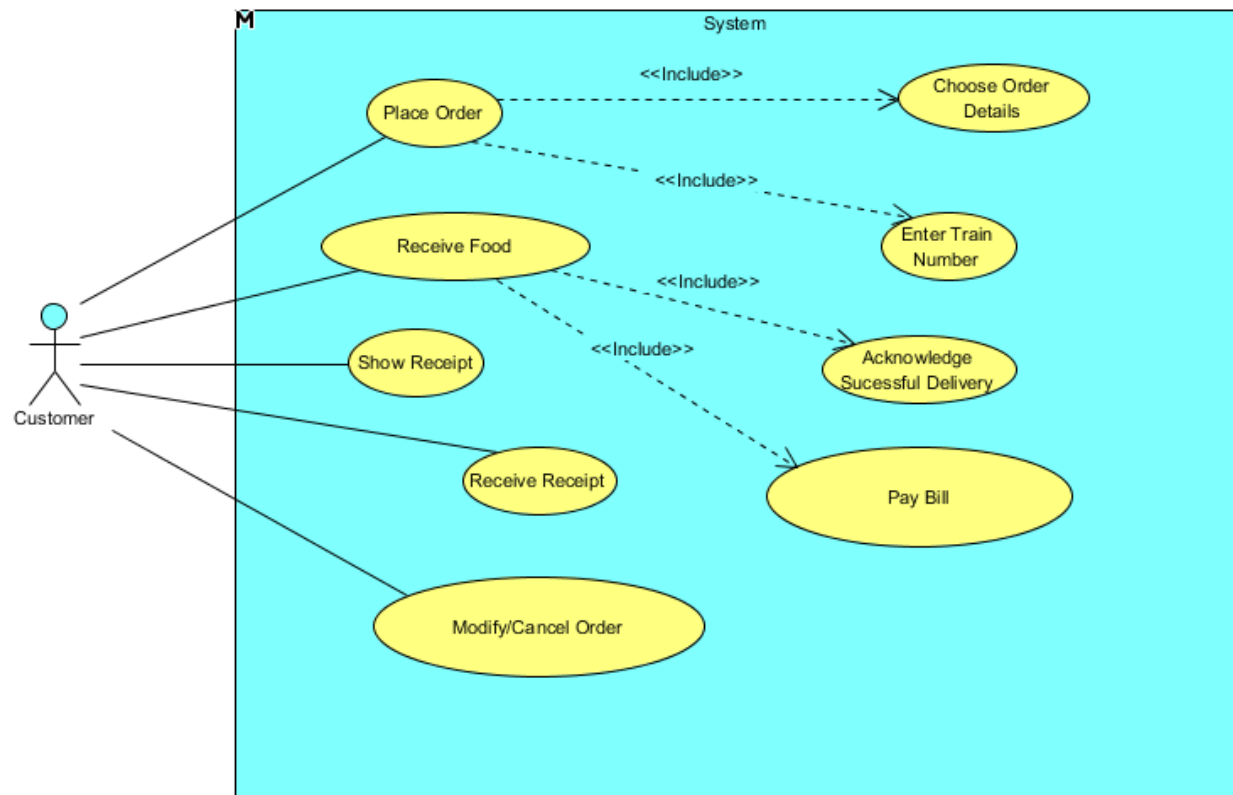
1.3 ANALYZING STAKEHOLDERS

There are four main types of stakeholders with respect to this project

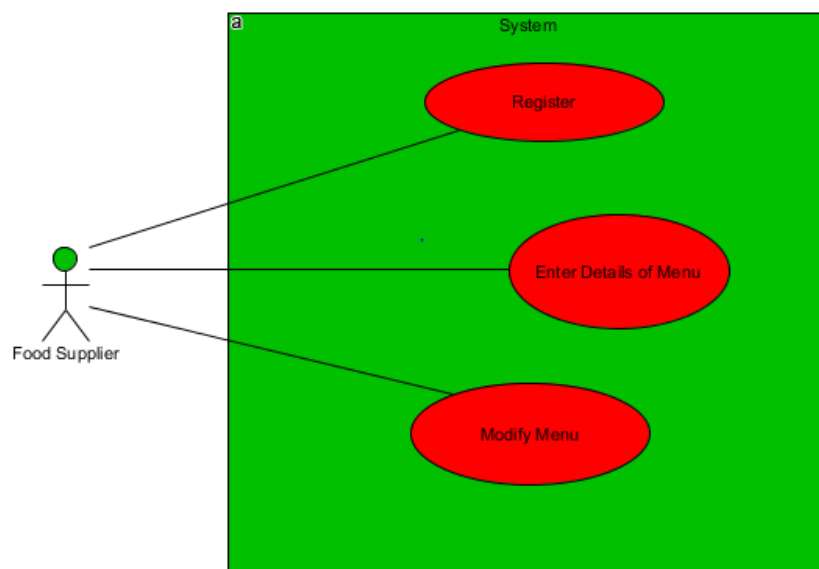
1. Management: Ability to view, accept/reject registration requests from food providers. Power to be able to add/remove trains, routes, food providers from the system. Capability to view success statistics of routes, agents.
2. Food Provider: Ability to request registration with management with ability to upload relevant details. Once registered, Power to Create/delete/modifay their own menu.
3. Agent: Power to accept/reject order placed by customer.
4. Customer: Ability to place order with specifications. Ability to pay. Ability to cancel/modify order if agent rejects an order. Can collect food after showing receipt.

USE CASE DIAGRAMS

User class Customer



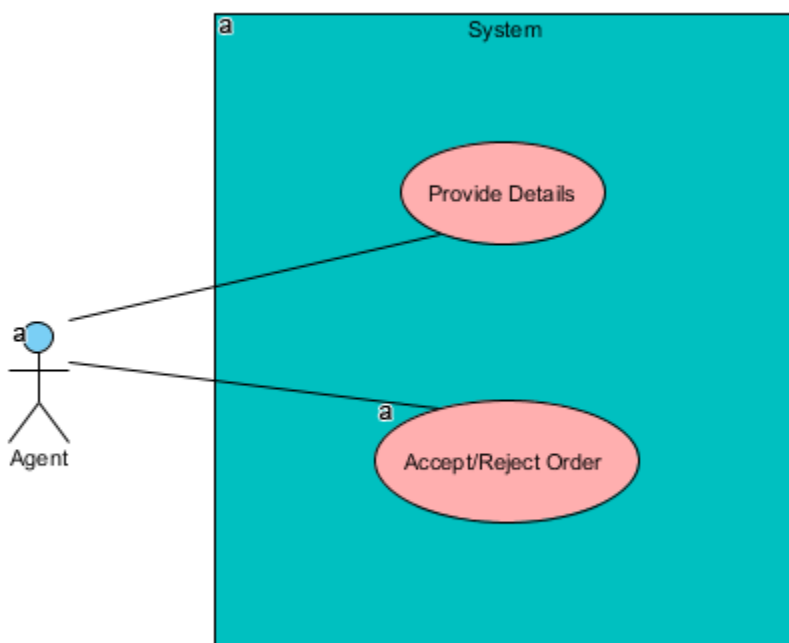
User Class - Food Provider



User Class - Management

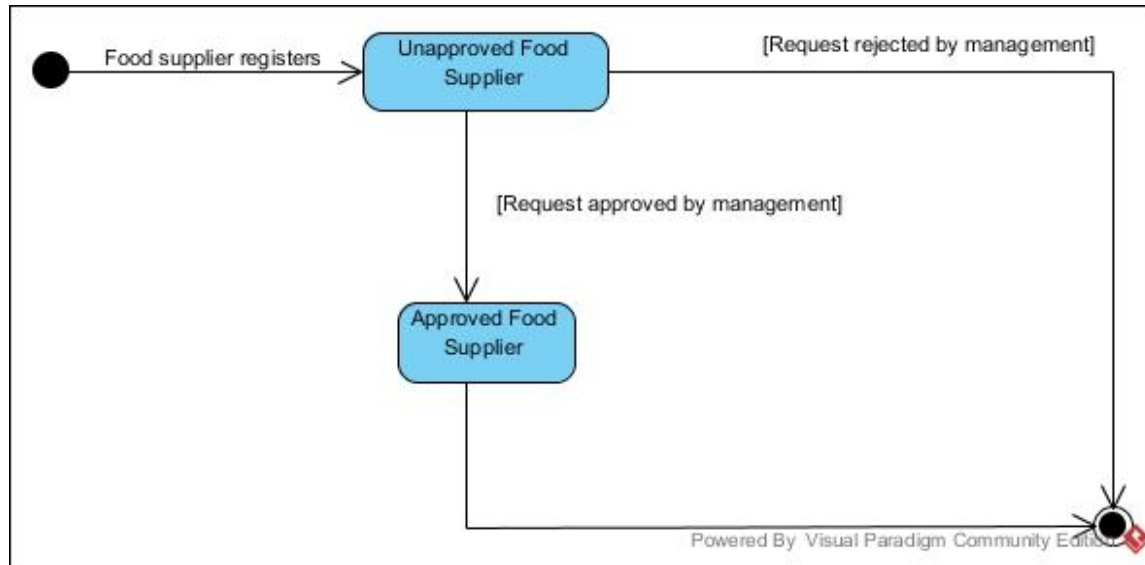


User Class - Agent

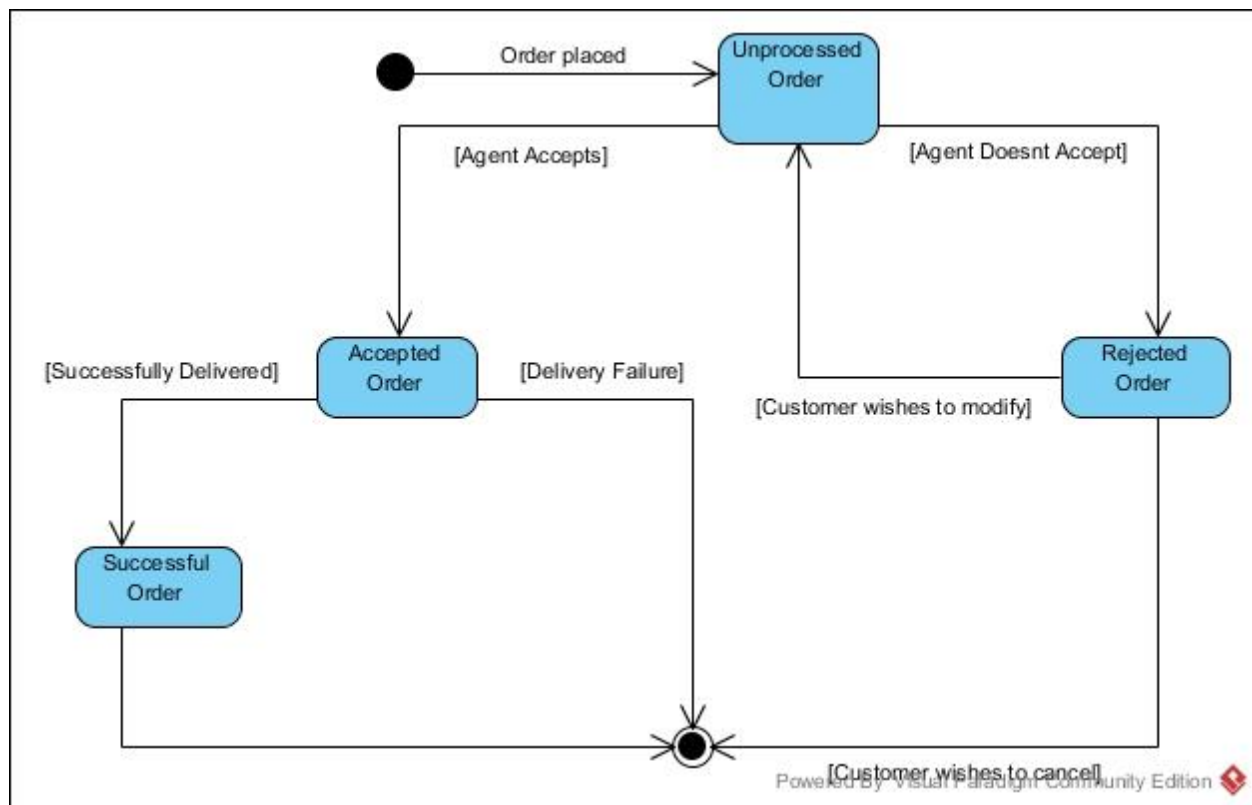


STATE CHART DIAGRAMS

Food Supplier:



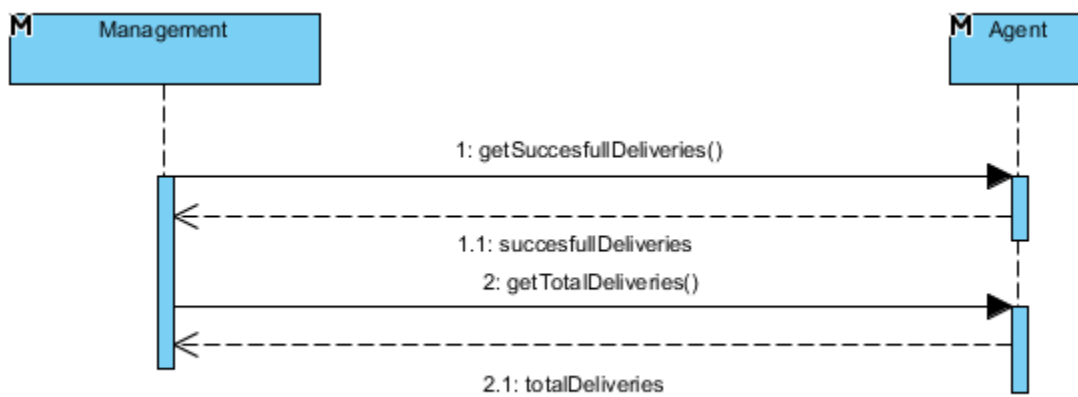
Order:



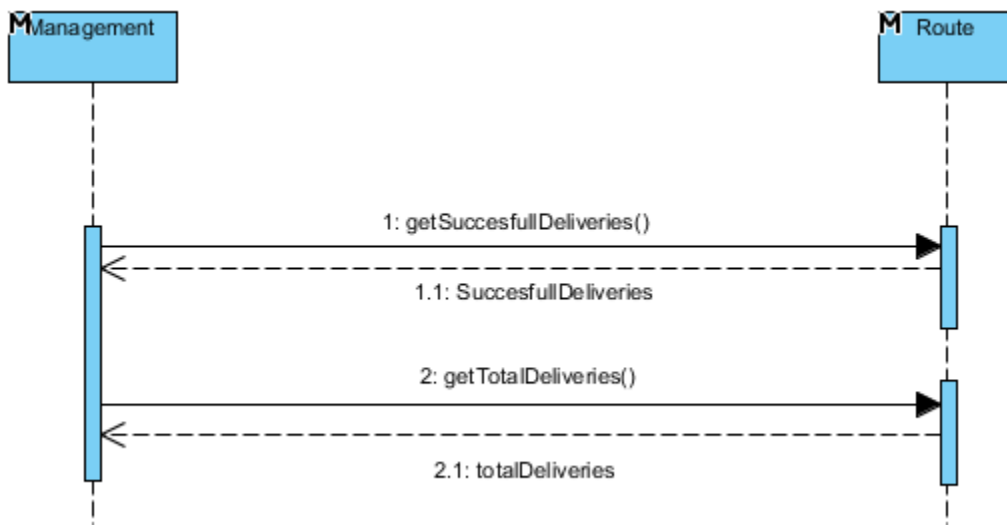
1.4 UNDERSTANDING THE FUNCTIONS THAT NEED TO BE SUPPORTED

SEQUENCE DIAGRAMS

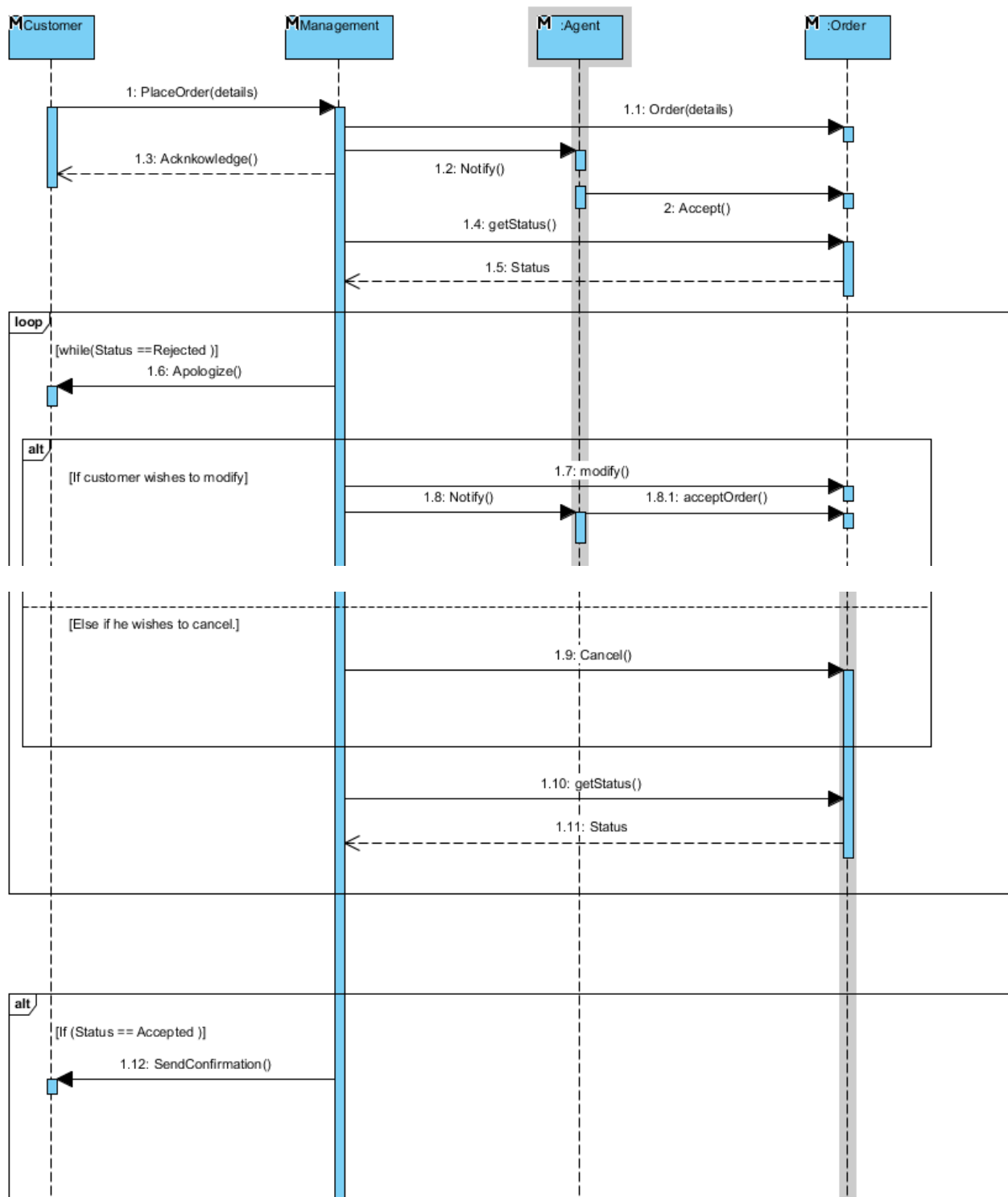
Get Statistics of agents:

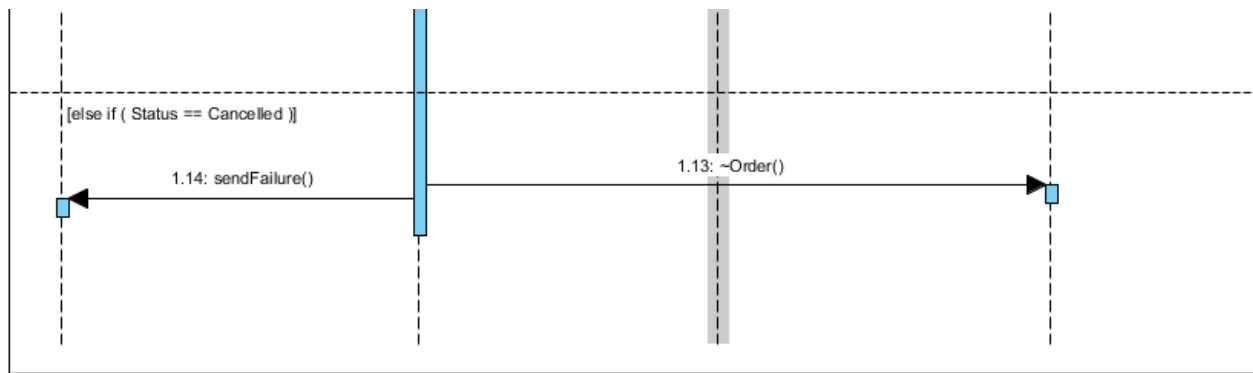


Get Statistics of Train Routes:

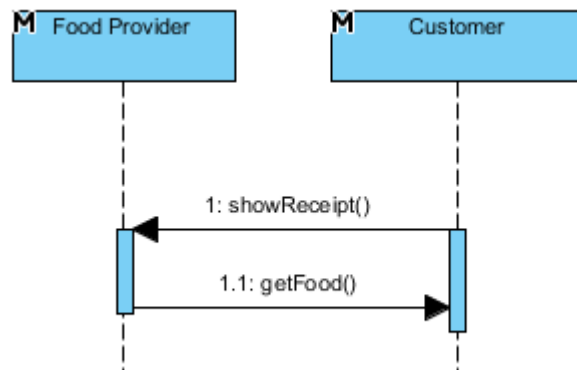


Order :

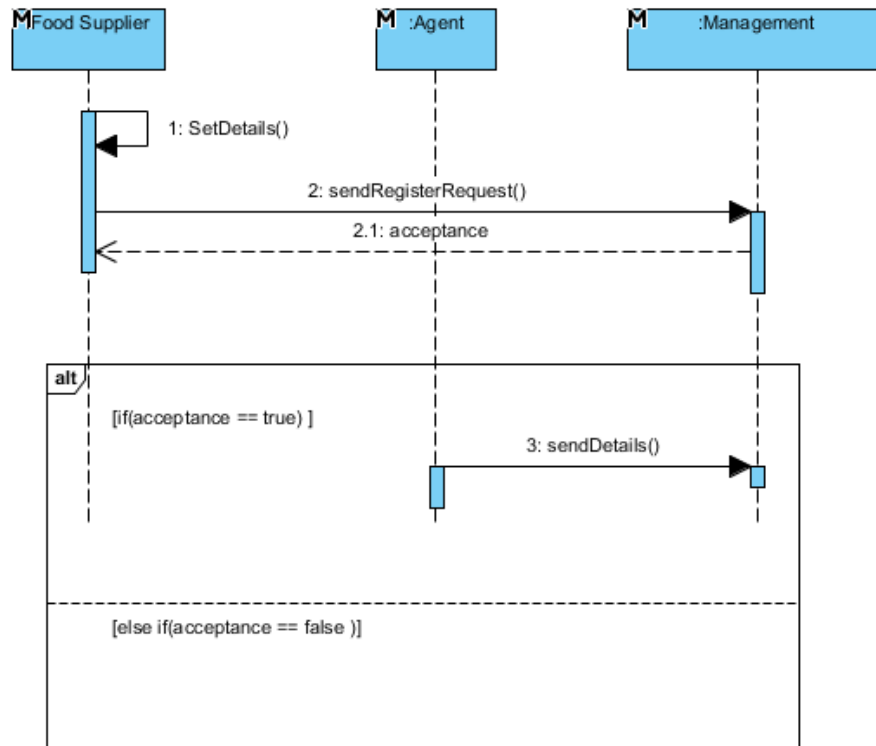




Receive food:

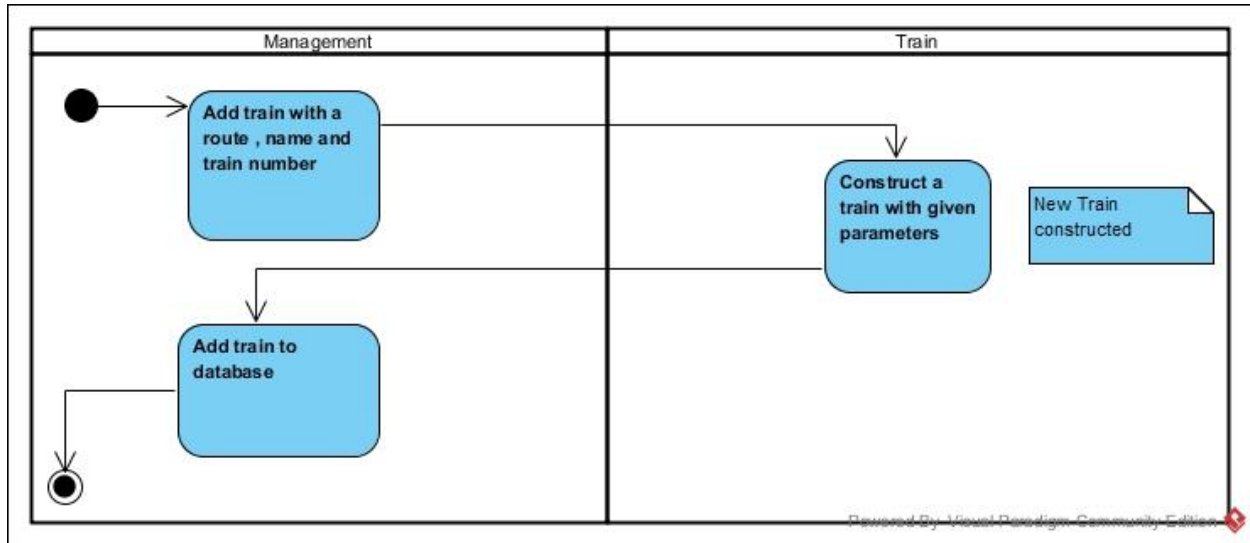


Registration of new food provider:

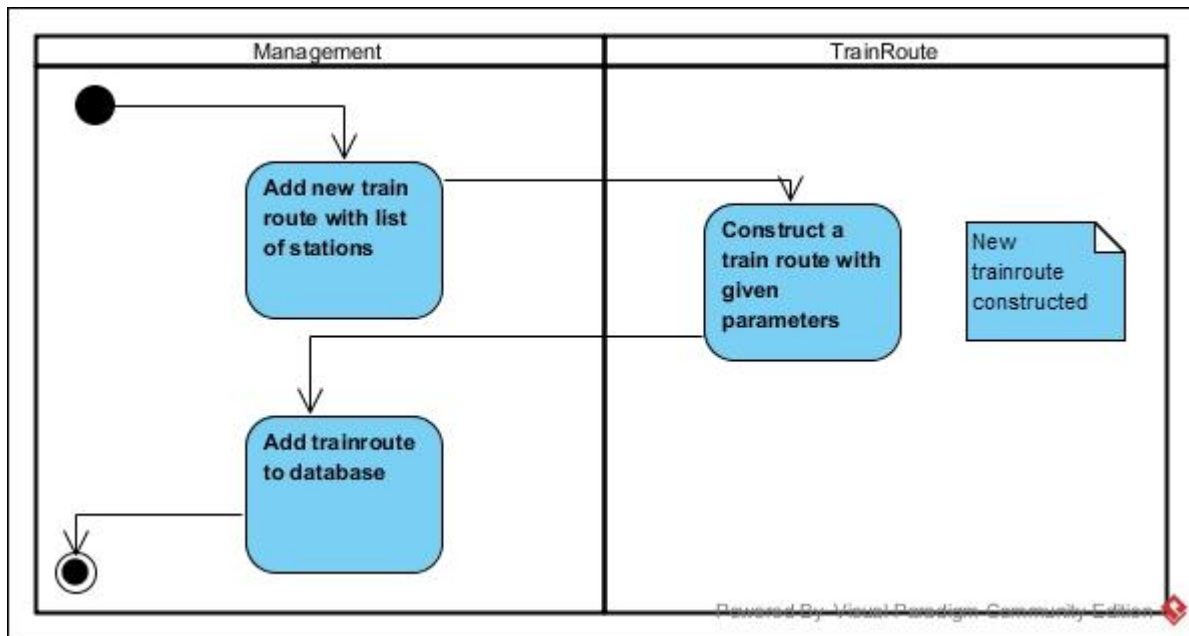


ACTIVITY DIAGRAM

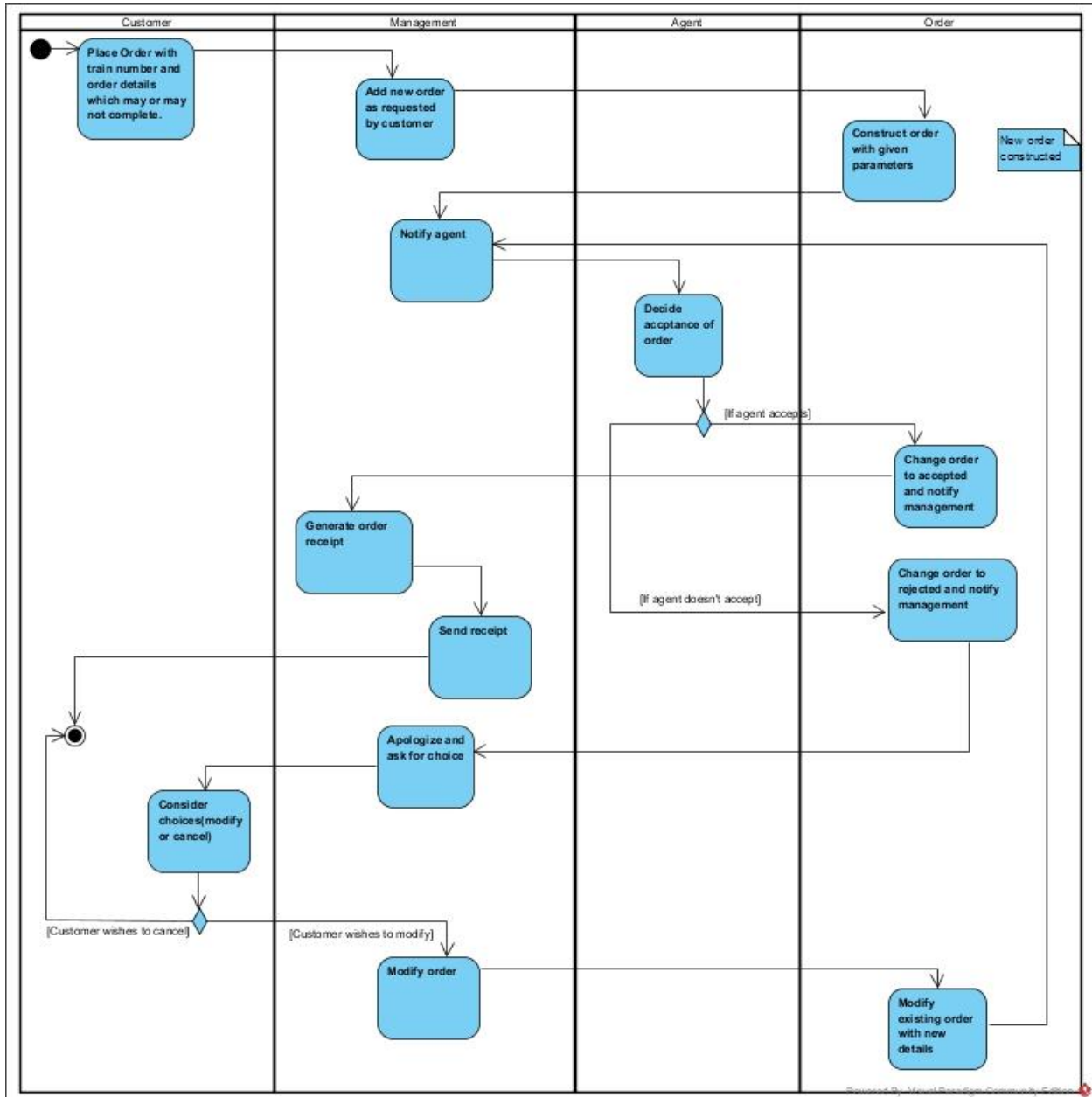
Add train :



Add Trainroute :

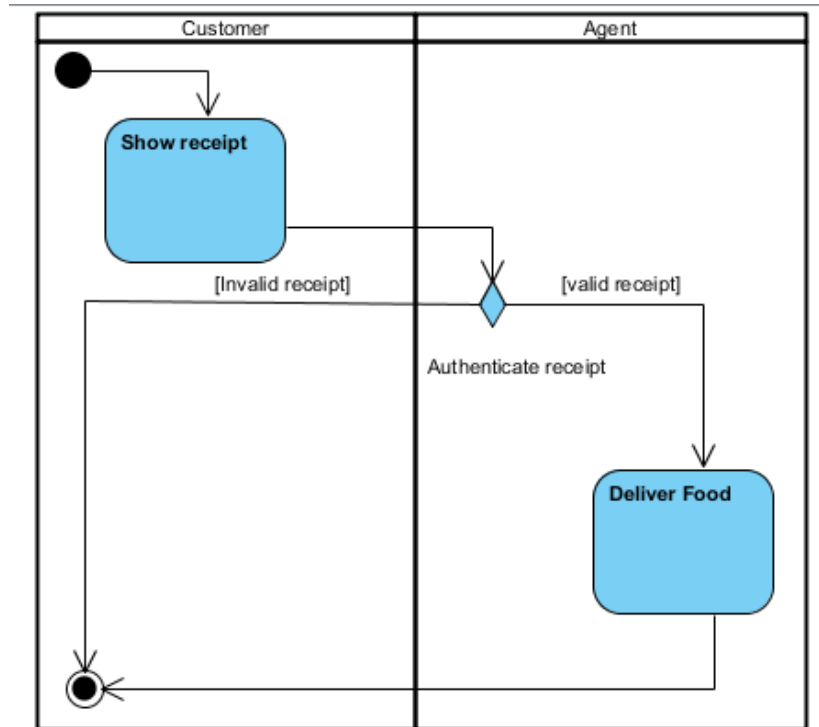


Order Placement:

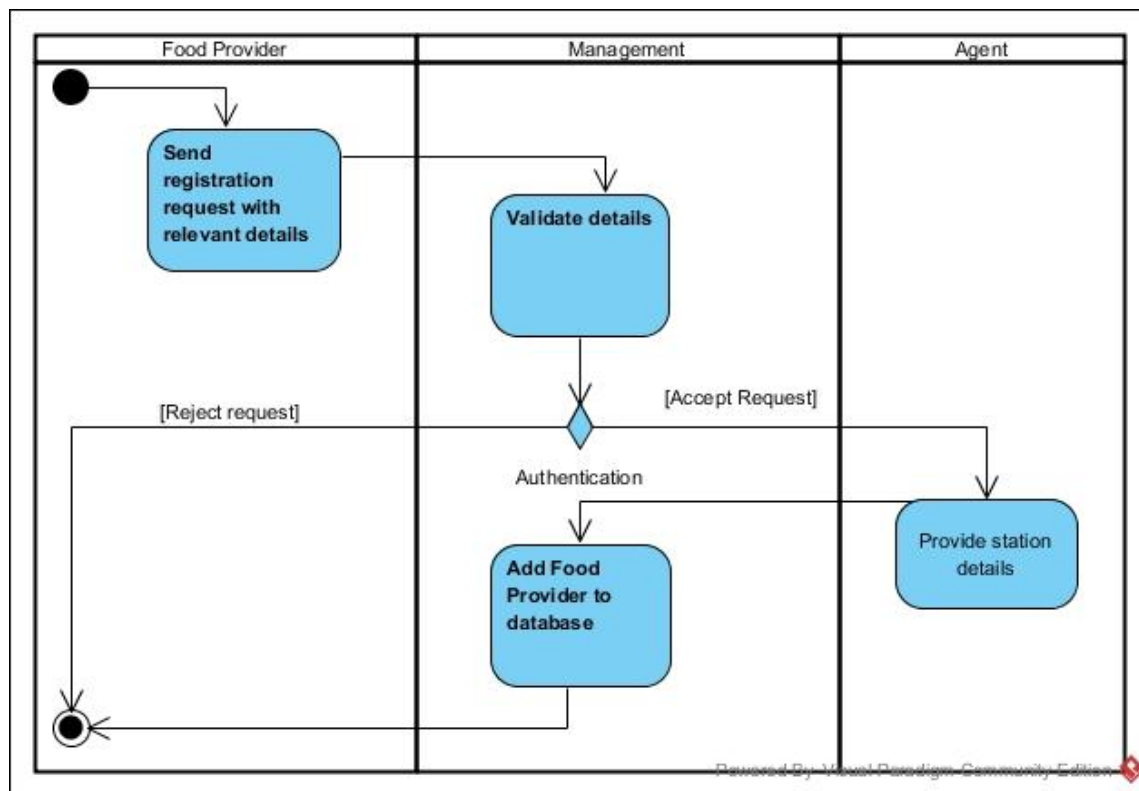


Reviewed By: Manual Review System, Creativity: 5/10/2023

Receive Food :



Register :



1.5 DIFFERENT CRITERIA OF FEASIBILITY

- Cost of the usage of software.
- Cost of hardware
- Life expectancy
- Reliability of software

1.6 CRISIS / FAILURE MANAGEMENT

The most important aspect to be considered for crisis management is the safety of data. For this we can implement a periodic auto-backup mechanism so that if the data is lost due to any reason the last backup can be used to restore the system to a previous state.

1.7 EVALUATION OF DIFFERENT POSSIBILITIES

1.7.1 SYSTEM NOTIFICATIONS TO CUSTOMER AND AGENT

There are two main ways to notify the customer and agent

1. Electronically(Example :- via email)
2. Over phone (Call or SMS).

Phone methods would mean extra funds and they are also less deterministic than electronic methods. Thus electronic methods are predominantly used. Smart phones are very common these days and it is not necessary to think about the stakeholders having no access to email etc.

1.7.2 CONNECTION BETWEEN MANAGEMENT AND SOFTWARE.

In general it is quite simple to manage the system but if the number of trains, train routes etc, then it becomes cumbersome for a single person to manage everything, hence many computers with parallel access to the database might be required. Thus scale of the system decides the cost of infrastructure.

1.7.3 SOFTWARE INFRASTRUCTURE

As of software, the necessities are almost minimum and cost near nothing, there is not much to consider.

1.7.4 TECHNOLOGY USED

The core requirement in this software is database management and the required technology for this is freely available and easily implemented (Example SQL). Thus good and reliable performance can be obtained by using these softwares.

1.6.5 HARDWARE REQUIREMENTS

The scale of the system decides the cost of infrastructure. As the system gets larger more number of storage devices will be needed to store the details completely and more number of parallel computers might be needed. This is more or less inevitable in any kind of implementation for this project.

1.7.6 SECURITY

Simple username, password based security system may be implemented. Or, if required other methods can thumb scanners, retinal imaging can be implemented with minimal possible changes. Cost of implementation increases (due to hardware requirements for other methods) if we use extra authentication methods like thumb impression whereas username, password based authentication is cost free.

1.8 REPORT

In the feasibility study, we went through the complete details of the problem. The objectives of the project have thought about and various options have been discussed in detail.

We understood the various functions that the software performs and also analyzed the various stakeholders and the actions performed by each one of them. We also understood the various possible abstractions of the problem statement. These were done using use case diagrams, collaboration diagrams. Data Flow diagrams etc.

Once the problem statement was understood completely, various possible solution to different modules were discussed along with advantages and disadvantages of each possibility. This includes hardware, software, technology, security. These were analyzed based on cost, lifetime and reliability measures of each alternative.

The first conclusion is that all the database management can be done with minimal software requirements.

About the hardware requirements, the scale and magnitude of the system decides the hardware requirements and we concluded that this is inevitable in any implementation of the project.

As of security, simple username password versus other complex systems like retinal fingerprinting, retinal imaging were considered. It was concluded that username password based protection was cost efficient and reliable as well.

For communication techniques, electronic versus phone based communication were considered.

It was concluded that electronic methods were more cost efficient and reliable than phone based communications.

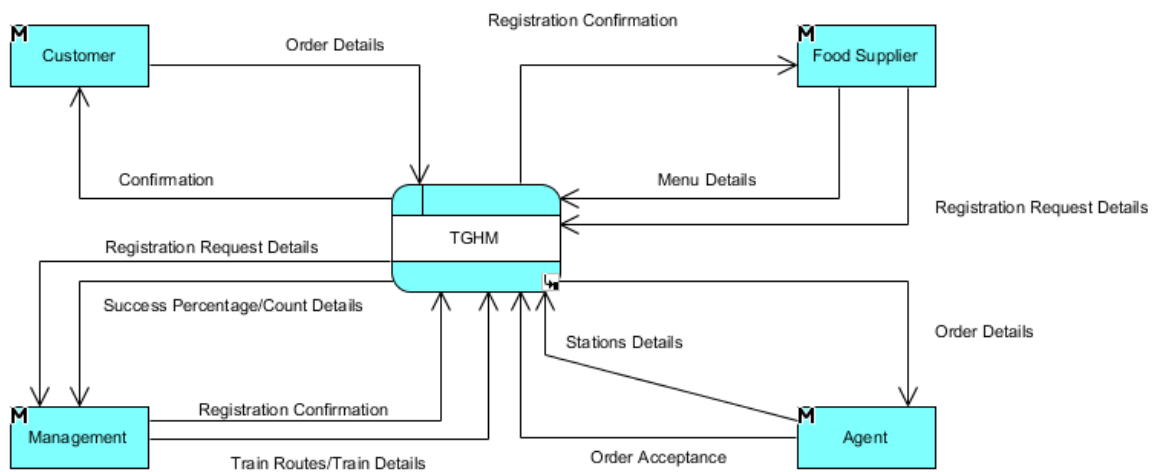
The main cost of implementation will arise from hardware requirements in case of large scale systems and this is inevitable and hence we proceed with the current plan.

Software Design (SD)

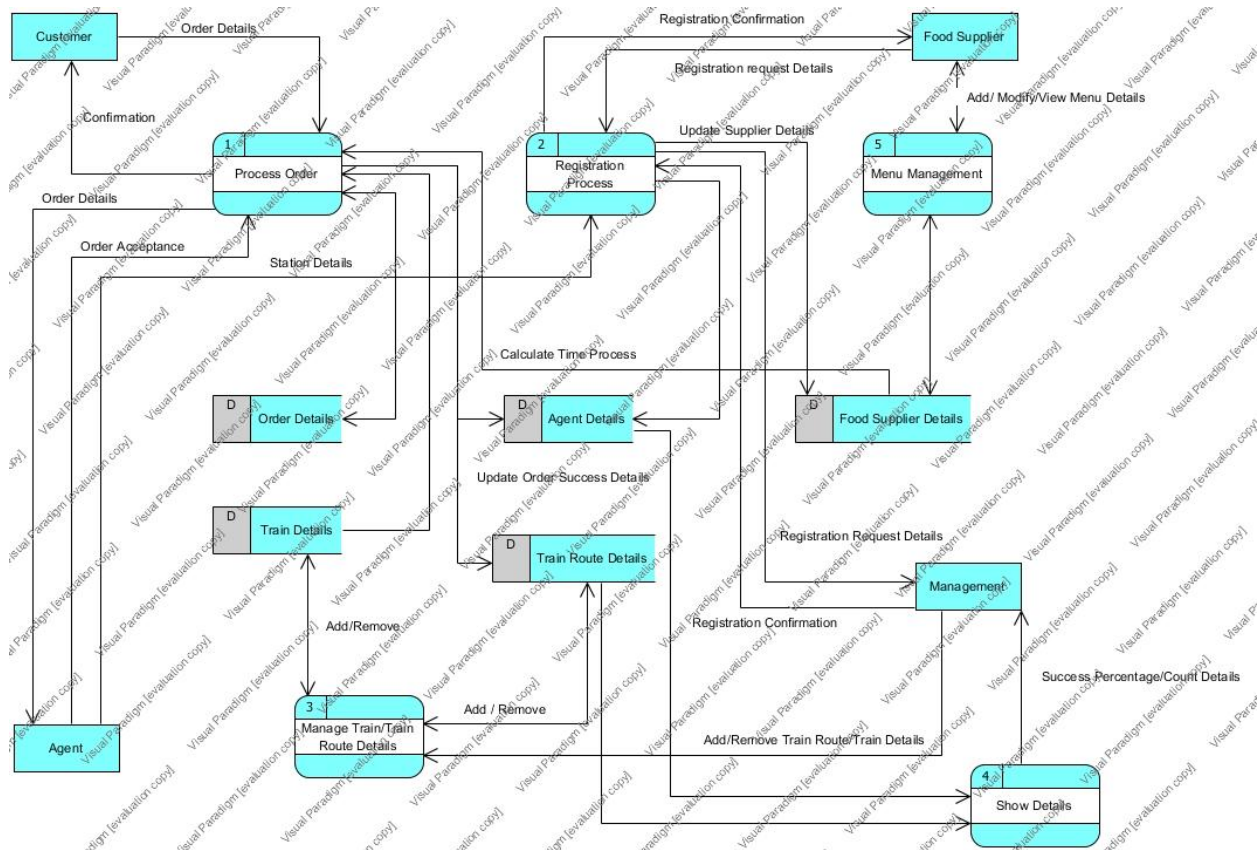
2 REQUIREMENT ANALYSIS

2.1 DATA FLOW DIAGRAMS

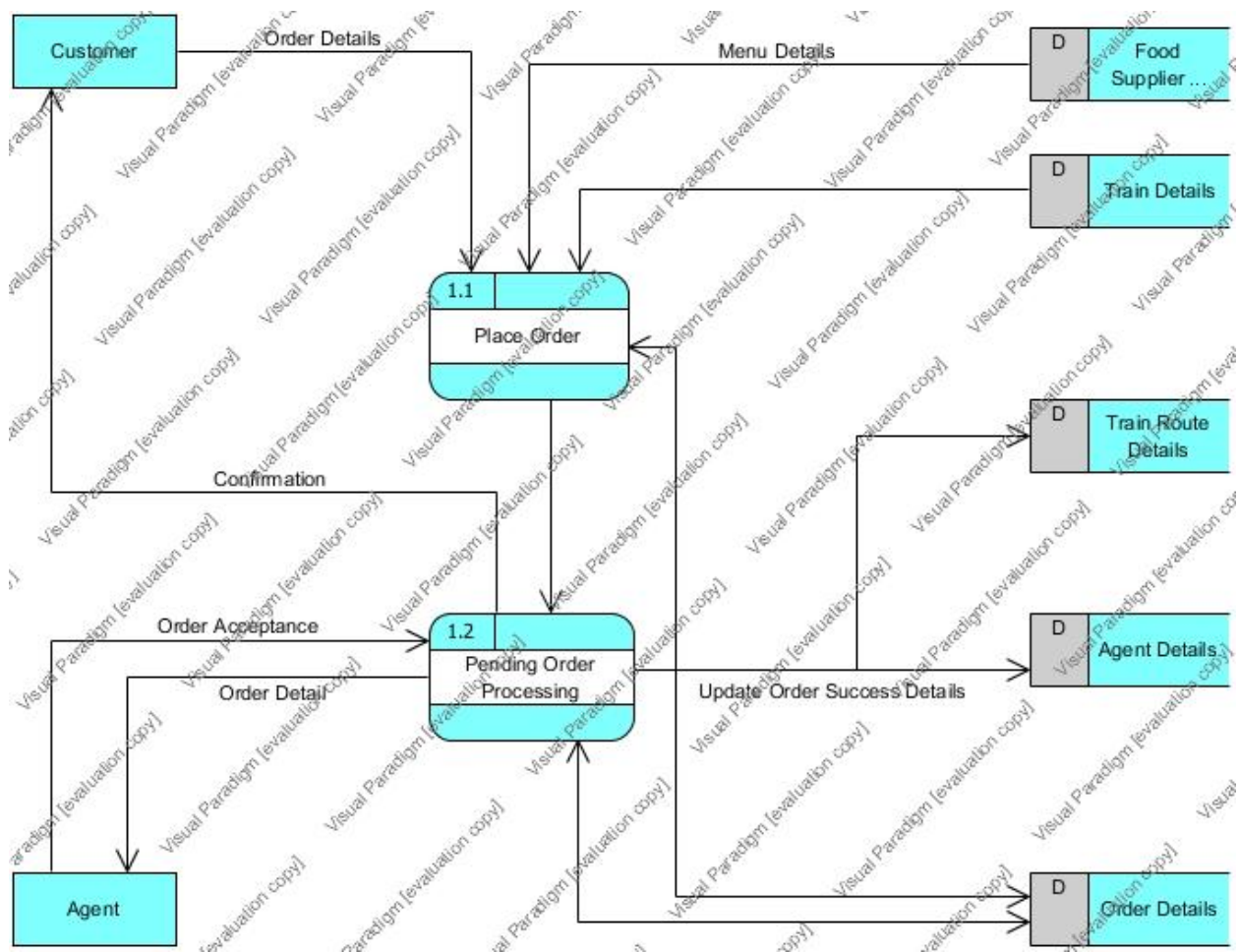
2.1.1 CONTEXT DIAGRAM



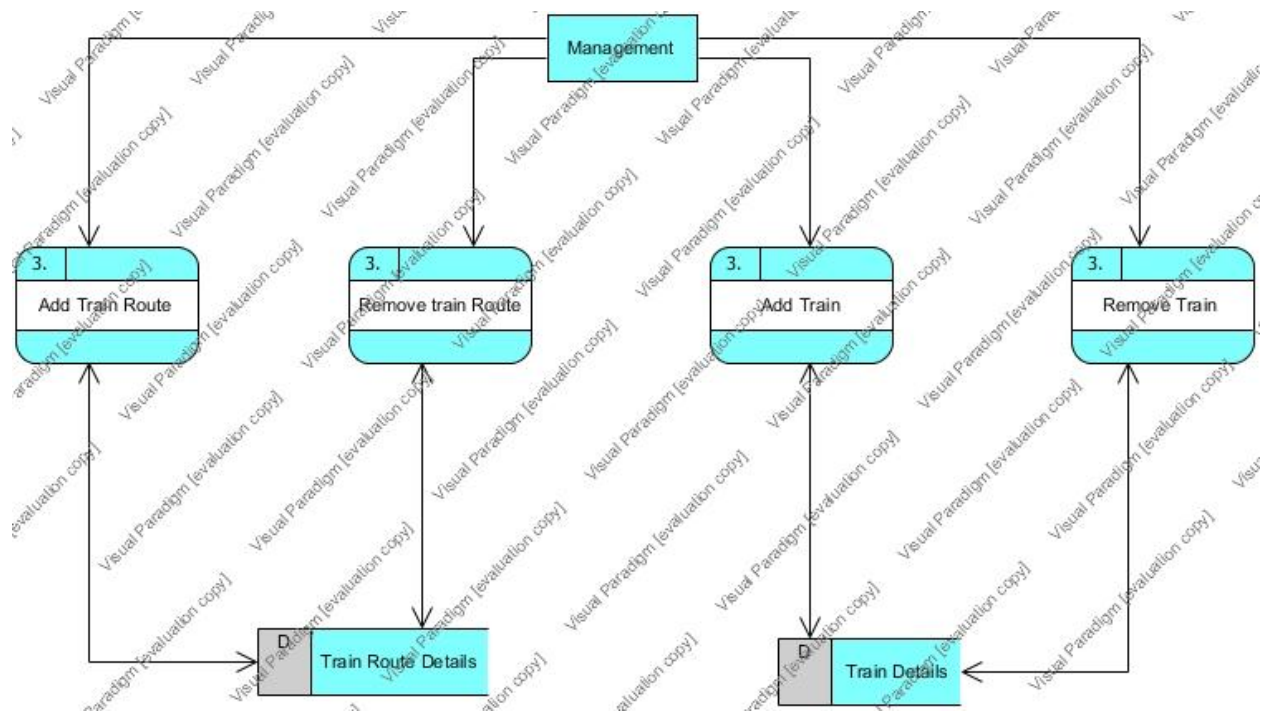
2.1.2 LEVEL ONE DIAGRAM



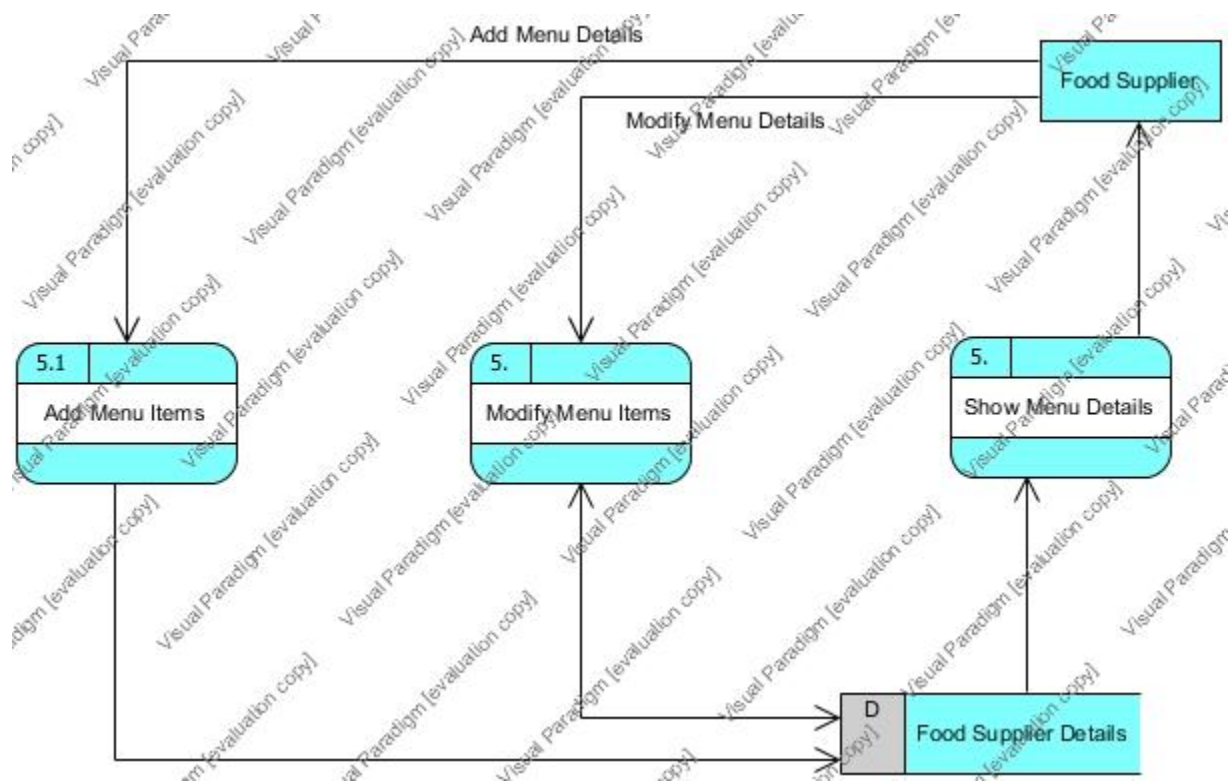
2.1.2 PROCESS ORDER – LEVEL TWO



2.1.3 MANAGE TRAIN / TRAIN ROUTE DETAILS – LEVEL TWO



2.1.4 MENU MANAGEMENT



3 DETAILED DESIGN

3.1 GLOBAL SYSTEM ARCHITECTURE

The overall system architecture is a 2-tier architecture which includes client at one end and the database at the other. There is no server based middle tier in the software being designed.

3.2 PLATFORM

Minimum System Requirements:

Hardware:-

- OS – Windows XP or later versions
- Processor – At least Pentium processor or equivalent.
- Hard Disk Space – 512 MB

Software:-

- MySQL, JDK 1.7,

Recommended System Requirements:

Hardware:-

- OS – Windows 7 or later versions of Ubuntu , OSX
- Processor – 400MHz, Pentium III or above
- Hard Disk Space – 512 MB
- Ram - 1GB

Software:-

- MySQL, JDK 1.7,

3.3 SOFTWARE ARCHITECTURE

The software is based completely on OOP model of programming. The classes represent the different stakeholders and all separable, encapsulable units.

Objects help in abstraction of the process and system and moreover they are responsible for maintaining the integrity of the TGHM. OOP paradigms like encapsulation and, inheritance are also implemented through objects and classes.

Java will be used for coding and the reason for this is that java is cross platform compatible and gives the coders an advantage when the project is more Interface oriented rather than computation oriented.

3.4 DATABASE

The database has been designed mainly in such a way that there is some sort of table that stores objects of all the separate classes. For example there is a table that stores list of all orders (class order). There is a table for customer with all customer details (class management). There is only one management and which stores relevant authentication details, thus there is no need for a table to store management details unless there are more than one admins.

3.5 DESIGN I/O

The management will be provided with an interactive and easy to use user interface to perform all the actions that it has been given power to perform. Similarly customers, food providers, agents will be provided with a good interface for performing relevant actions. Swing components will be used for interaction interfaces (which includes, JButtons, JTextfields etc.). Auto fill will be provided to the customer on the click of a button option.

3.6 PROCEDURES & USERS

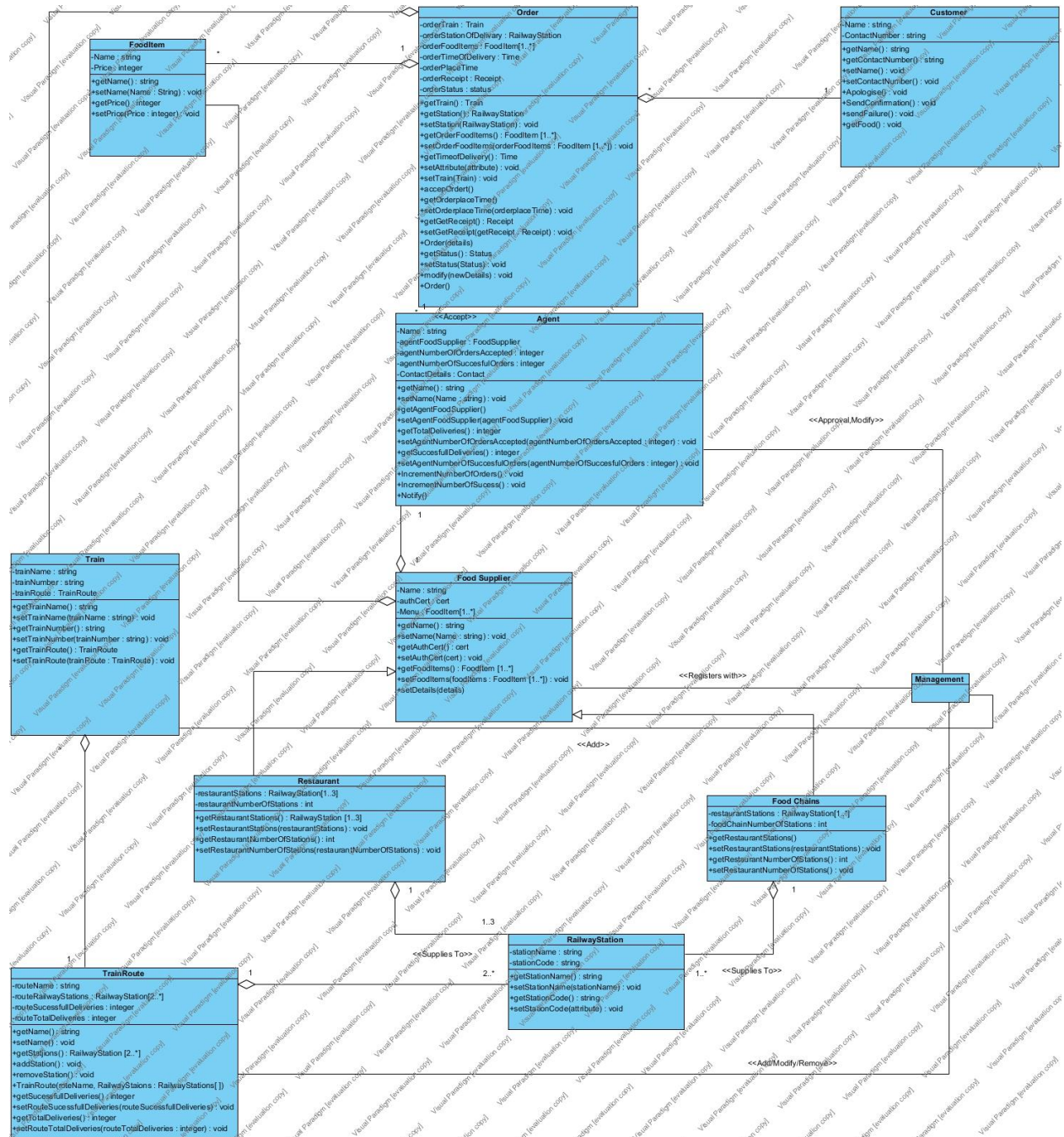
Users:

1. Management: Ability to view, accept/reject registration requests from food providers. Power to be able to add/remove trains, routes, food providers from the system. Capability to view success statistics of routes, agents.
2. Food Provider: Ability to request registration with management with ability to upload relevant details. Once registered, Power to Create/delete/modify their own menu.
3. Agent: Power to accept/reject order placed by customer.
4. Customer: Ability to place order with specifications. Ability to pay. Ability to cancel/modify order if agent rejects an order. Can collect food after showing receipt.

Procedures:

Refer sequence diagrams and communication diagrams.

3.7 CLASS DIAGRAM



3.8 INTERFACE

All the users will be provided with a swing based interface which is easy to use and interactive. This will include parts like JButton, JTextField etc.

The interface between the database and the program parts will be done by using MySQL which is easy to use and handle and reliable.

3.9 REPORT

Global system architecture, System Requirements, Hardware Requirements, Platform, and Database management, programming style techniques have been discussed in this section of the report.

A simple two tier system has been used to implement the interfaces for each user. OO paradigms have been applied via class and object method of coding. The system has minimal software and hardware requirements and will be usable to almost any kind of user. Database management will be performed using MySQL which is cost effective, easy to use and reliable.