Bilkent University

Department of Computer Engineering

CS 353 Term Project Proposal
Shipping Company Data Management System
Group 3

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1. Introduction

Nowadays, shipment companies have been growing rapidly and it had became harder to track all the information about the goods that are transferred by those companies. Thus, for the shipment company managers, using a shipping software for tracking all of their packages had become inevitable. Basically, a shipping software allows managers to track all of the packages that are transferred and delivered by their company to their customers. It allows companies to deal with any error immediately since in those large companies there is a considerable amount of error margin. Besides the errors, it eases the managers and employees work load since the software allows an instant data entry.

In this application, a data management system for a shipping company will be designed and implemented. By using this software, the shipping company will be able to track their branches in different locations and their employees that are working in those branches. Those employees will be able to track all the package transfers that are made in their branch and additionally they will be able to assign the packages to the couriers for them to deliver. Customers will also be able to call a courier to their addresses in order to deliver the package or they can also drop a package to a branch. Lastly, the malformed packages or the lost packages are also handled by this system and customers will be able to report their complaints. Our shipping software is designed to handle all these functionalities in order to provide a user-friendly and reliable system for the easen the management for large numbers of delivered goods.

In this report, a description of this application is given, the requirements and limitations are discussed. An Entity-Relationship diagram is designed to provide an optimal design for a shipment software database which fulfills all the requirements needed for the company. The number of entities and the corresponding attributes tried to be minimized and the most efficient relations between the entities had been made.

2. Project Definition

This app, which was established for the cargo tracking and arrangement system, records and examines the whole process from the departure of the cargo from the customers to the arrival at its destination, as well as providing the customers with the opportunity to present some complaints and feedback about this process.

The customer, who delivers the package from the branch or from his home, will be able to see where and in what condition the package is until it reaches the address to be sent. Packages will be exposed to 3 types of transportation methods, from home to branch, from branch to branch, and from branch to home, depending on the situation.

Employees, who are divided into couriers and desk workers, will be able to enter updates about the package in line with their limitations and rights. Employees working in the branch will be able to indicate that the package has arrived at the branch and is delivered from the branch to the home or from the branch to the branch. Couriers, on the other hand, will be able to indicate that they have been delivered or picked up from home.

Customers, who can observe this while the cargo is in the courier or at the branch, will be able to submit their complaints, questions or feedback through the same system. Through the application, it will be possible to see where the cargo is instantly or which locations it has visited depending on the date and when it will reach its destination in an estimated manner.

The purpose of this application is to keep the information and data of the cargoes efficiently and to display them in an appropriate way for the user and the employees. If something happens to the cargo, thanks to the registered employee IDs, the company officials will be able to see who has the last access and who is responsible, and the customer's grievance will be eliminated.

3. Requirements

3.1. Functional Requirements

There are three types of users; a customer, an employee in a branch, a carrier. The followings are the functional requirements of our web application:

- Users (customer, employee, carrier) can sign in to the system using email and password (if they are already registered)
- Customers can sign up by providing an email, phone number, and password
- Customers can initialize cargo delivery from home
- Customers can initialize cargo delivery in the branch
- Customers can track the location/status of the packages that are sent by or to be delivered to them
- Customers can decline the shipping and file a report

- Customers can send a complaint about the lost package
- Employees in a branch can transfer the packages to other branches
- Employees in a branch can assign packages to carriers for delivery to customers
- Employees in a branch can change the status of the packages which are in their branch
- Carriers can change the status of the packages which are delivered or taken by them.

3.2. Non-Functional Requirements

The followings are the non-functional requirements of our web application:

3.2.1. Usability

Users can use web browsers to use the web application. The web application will be responsive so that users can also use the application on their smartphones. The design will be simplified so that all ages can use the application without encountering any difficulty. The color palette, typography, design of components will make it easy to understand the workflow of the shipment processes.

3.2.2. Reliability

Users will use an email and password to sign in to the application. We will save them encrypted in the database. If the user has forgotten his/her password, using the forgot password screen, the user can initialize the password recovery process and will receive an email about the process. The data will have a backup which will be updated at the end of each day. All the sensitive data will be encrypted using special algorithms before being sent to the database.

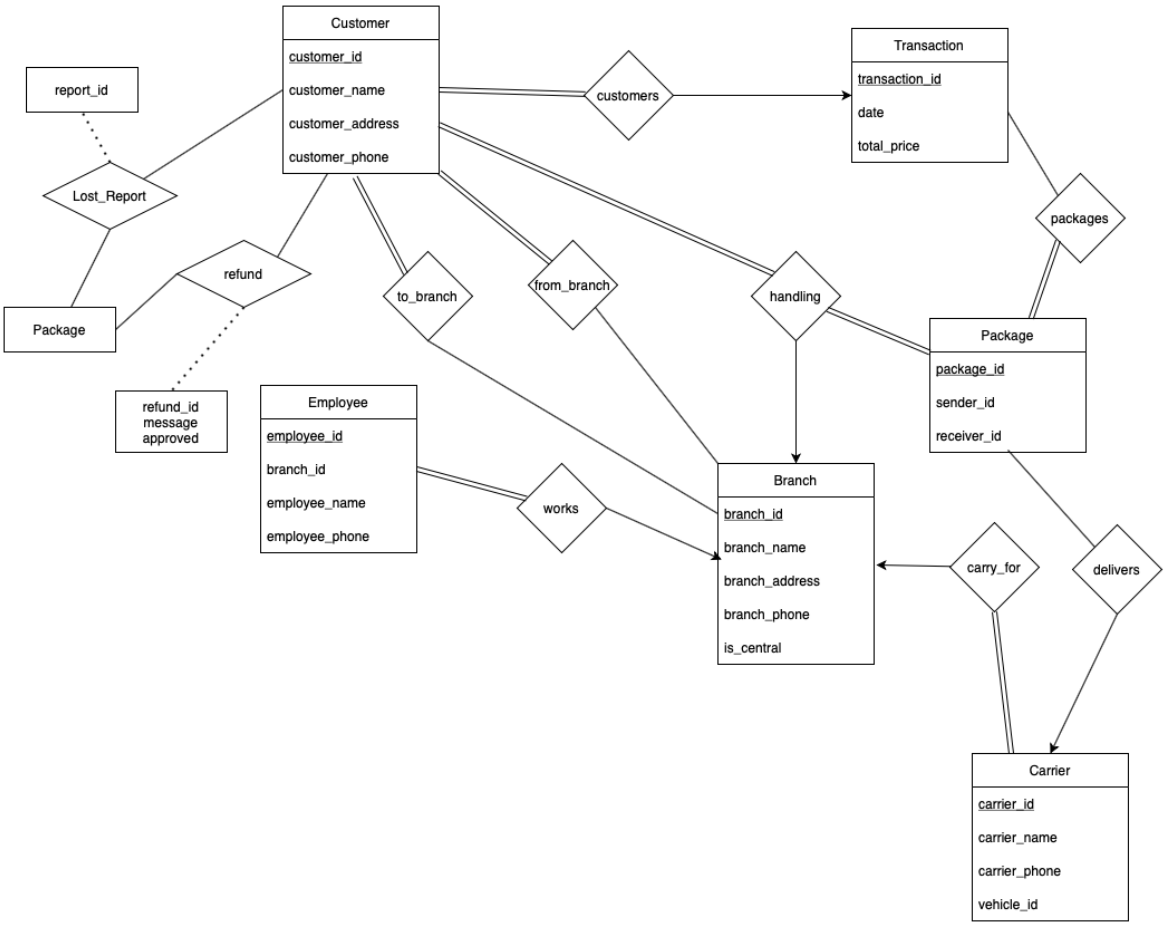
3.2.3. Performance

In an application performance is one of the most important factors in the success of the application. We will use highly prestigious technologies such as React, Django in order to guarantee performance, and the server will be deployed in Amazon AWS to make sure that servers will not shut down unexpectedly.
The server will respond to user requests in less than 3 seconds and will handle 1000 requests concurrently.

4. Limitations

- There must be 3 carriers in each branch who are assigned to deliver packages from branch to home of customers
- In each branch, there are 2 employees in the branch who stay at the branch during working times and 5 employees who are assigned to transport packages between branches.
- An employee in a branch can only change the status of the packages which are transferred from or delivered to his/her branch.
- A carrier can only change the status of the packages which are assigned to him/her.
- A customer can only track the location/status of the packages which are sent by or to be delivered to them
- A customer can only decline the shipping of the packages which are sent by or to be delivered to them
- Each day there can be transactions from each branch to at most 5 other branches.
- A carrier can carry at most 20 packages in a day
- Packages have prices according to their kilogram.
- A package must be lighter than 10 kg. Packages heavier than 10 kg are not accepted.
- Package weight between 0 kg - 3 kg : 1$
- Package weight between 3 kg - 5 kg : 1.5$
- Package weight between 5 kg - 7 kg : 2$
- Package weight between 7 kg - 10 kg : 2.5$
- The company has only a domestic delivery network. Packages cannot be delivered across the country.
- The distance between the branch of departure and the destination address of the package does not change the price.
- Long distances may take 5-9 days to deliver.

5. ER Diagram



A quality version of the ER Diagram is available on the website.

6. Website

https://etophiana.com/cs353-g4/