<The Bus Ticket System>

System Design

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<Date>

< DOĞAN SARIBAŞ

FEYZULLAH BERKAY DANIŞ

DENİZ ÇALIŞKAN

NURSENA KARAKULAH >

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SYSTEM DESIGN DOCUMENT[1]

# Introduction

## Purpose of the System

Viatorem is a website to buy bus tickets. It has an easy to use interface, it is easy to manage for admins. Also, it provides direct communication chance with an officer. Viatorem is a replacement alternative for websites such as kamilkoç.

## Design Goals

Usability: Viatorem is easy to understand and use for ordinary internet users. Anyone who occasionally uses internet should not have any problem with using Viatorem.

Reliability: User password is not displayable even for admins and payment information is not shown anywhere except purchase page.

Performance: Registered users can buy as many tickets as they want.

Supportability: Admin should be able to organize trips and campaigns without any problem.

Implementation:

Legal: This software ins regulated under the DDNB(first letters of our names) general public license.

## Definitions, Acronyms, and Abbreviations

Viatorem is designed with using php, html, and mysql.

Admin: Admin is a user who is responsible from the system.

Visitor: A user who is not logged in to system.

Registered User: A user who io logged in to system.

Viatorem: A website where you can buy and reserve bus tickets from a city to another.

Officer: Officer is an employee whose job is answering mails sent through “contact us” section.

Interface: Interface is the sight of website which users see.

Html: Html is a programming language.

Php: php is a programming language.

MySQL: MySql is a database management system.

Subsystem: Subsystem is collection of classes that are closely related to each other.

## References

* KamilKoç
* Metro Tourism
* Biletall.com

# Current Software Architecture

Especially across the country, there are many different, advanced applications that offer the bus ticket purchase/reservation function, which is the main purpose of our application. An example of these applications is given below.

[www.kamilkoc.com](http://www.kamilkoc.com)

[www.metroturizm.com](http://www.metroturizm.com)

[www.obilet.com](http://www.obilet.com)

The main subsystem of these applications is to purchase or reserve bus tickets. Advanced and large applications such as these cater to a wide range of users, accommodating a range of system requirements. In addition to the technical requirements, they have a long operational requirement. Our application, on the other hand, does not appeal to a large audience as much as the applications mentioned, but to smaller audiences. Since it is a web-based application, the 3-Layered artchitecture structure is used as software architecture pattern. The system has got four actors; admin, registered user, visitor and officer who will contact with the registered users. Our system has a design that meets the technical requirements expected by the users and minimizes the problems that may arise.

# Proposed Software Architecture

At out system, users will be able to search for trips to their destination, select the one that suits them, and purchase or reserve. They can cancel these transactions if they want. It will not endanger users for safety reasons. User data privacy is extremely important and will keep the data as secure as possible. Users will be able to cancel the transactions they perform within the specified time limits, such as cancellation of purchased tickets and cancellation of the reservation. The user interface is successfully simple to understand and does not make the user difficult to use the application. Due to the creation of a fast data exchange channel between the client-side and the server-side, the user is intended to avoid time-consuming problems when using the application. Our system opens a window to the users to solve the problems encountered while using the system as soon as possible. Users are provided with a service to communicate any complaints or suggestions to the system administrator. Ticket information received by the user will be shown to the user through the application at any time. In this way, the user will benefit if they forgets the information.

## Overview

The system will have a layered architecture and there will be 3 layers; there are interface , application and data. Users will be interacting with the system by using the interface layer that designed in simple way to use, application layer will have all the functions of the system, for example buying/reservation of a ticket, interact with the officer, cancellations etc. and data layer will have all the information about the users, tickets, trips, messages etc.

Interface layer will have the AdminInterface, UserInterface and OfficerInterface subsystems.

Application layer will have the Login Subsystem, Registration Subsystem, TripManagement Subsystem, Campaign Subsystem, Communication Subsystem and UserManagement Subsystem. These subsystems will be responsible of login, registration, buy ticket, communication, edit trip, edit account, view trip and edit campaign services.

Data layer will have the TripInfo, TicketInfo, MessageInfo, CampaignInfo and UserInfo subsystems that has got the information about users, tickets, messages ,trips and campaigns.

Admin can be manage to add trip, cancel trip,add campaign, cancel ticket, view all trips.

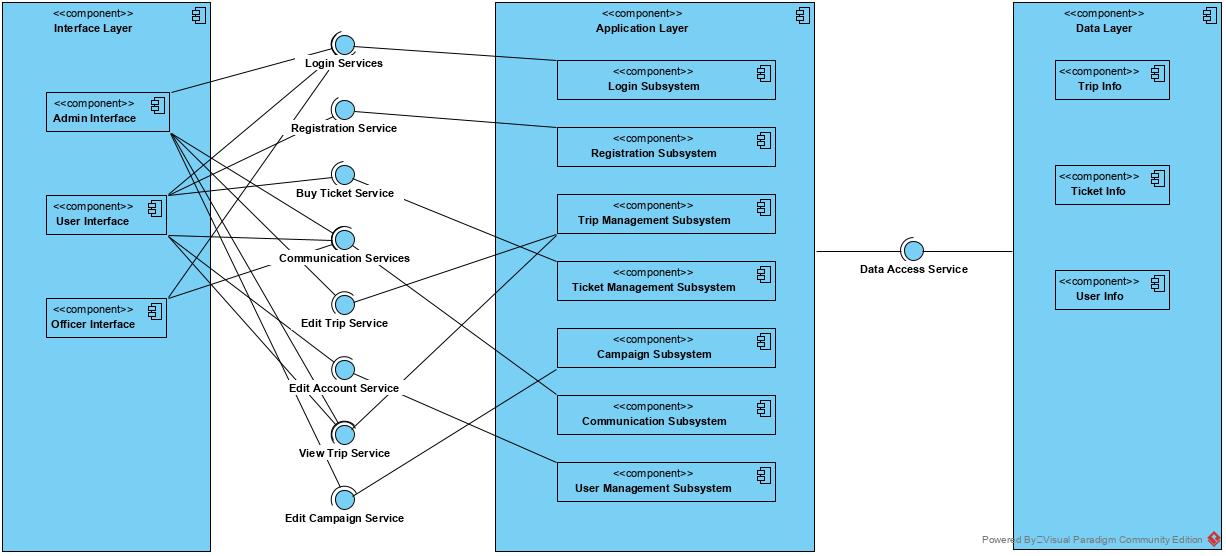
Registered user and visitor will have the services of viewing trips, buying tickets and canceling tickets. Some of the functions are specific to registered user and visitor separately. In addition to the registered user subsystem, it will be responsible for contacting the officer, editing profile, login and booking services.

## System Decomposition

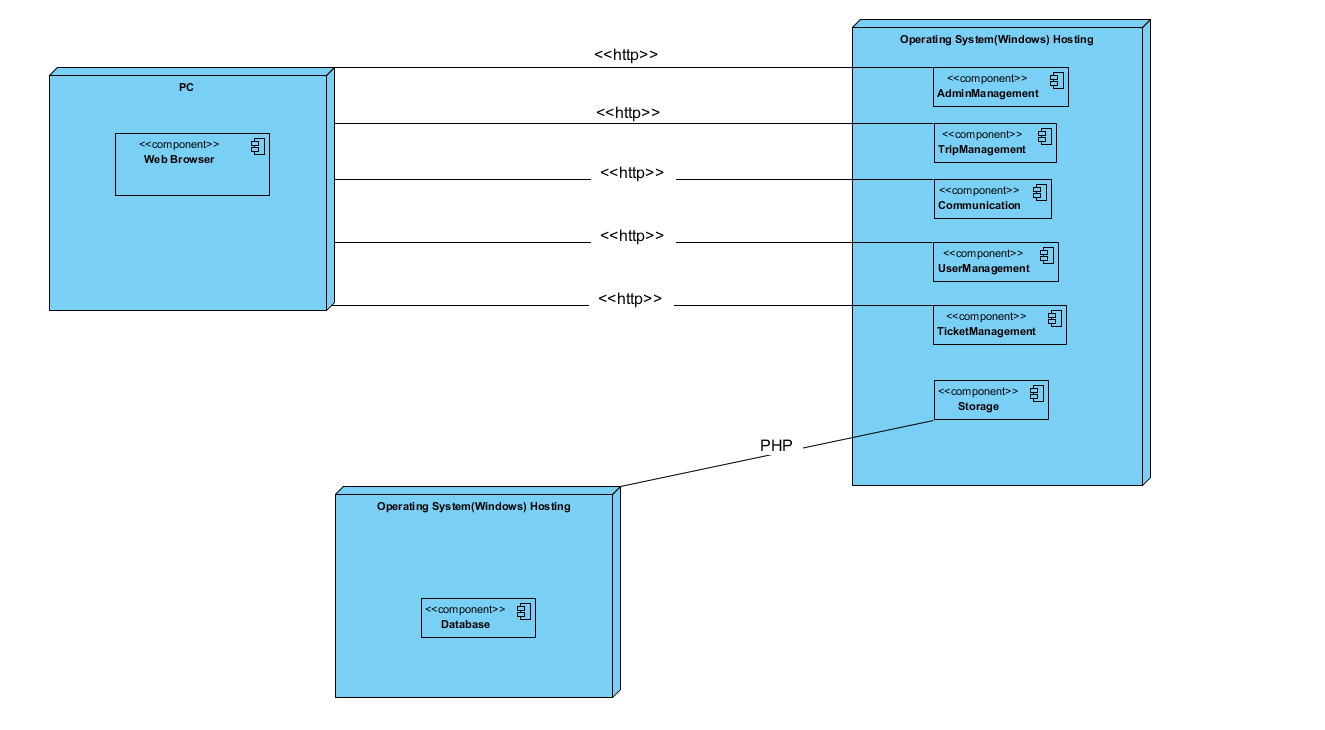
In Data Layer we have components of TripInfo that holds information about trips that are added or cancelled in the system, TicketInfo that holds information about tickets and reservations , UserInfo that holds information about registered users and admin.

In application layer holds Login, Registration, TripManagement, TicketManagement, Campaign, Communication, UserManegement subsystems. Login subsystem handles the logining in to the system service for admin, officer and registered users. Registration subsystem handles the registration service. TripManagement subsystem handles services like adding, cancelling or viewing trips. TicketManagement subsystem handles buying, cancelling ticket services. Campaign Subsystem handles functions of adding campaign to system. Communication subsytem handles communicaiton services, UserManagement subsytem handles EditAccount services.

In Interface Layer Admin interface provides admin services of login, communication, EditTrip, ViewTrip, EditCampaign, UserInterface provides users services of login, Registration, BuyTicket, Communication, EditAccount, ViewTrip, Officer Interface provides officer services of Login and communication.

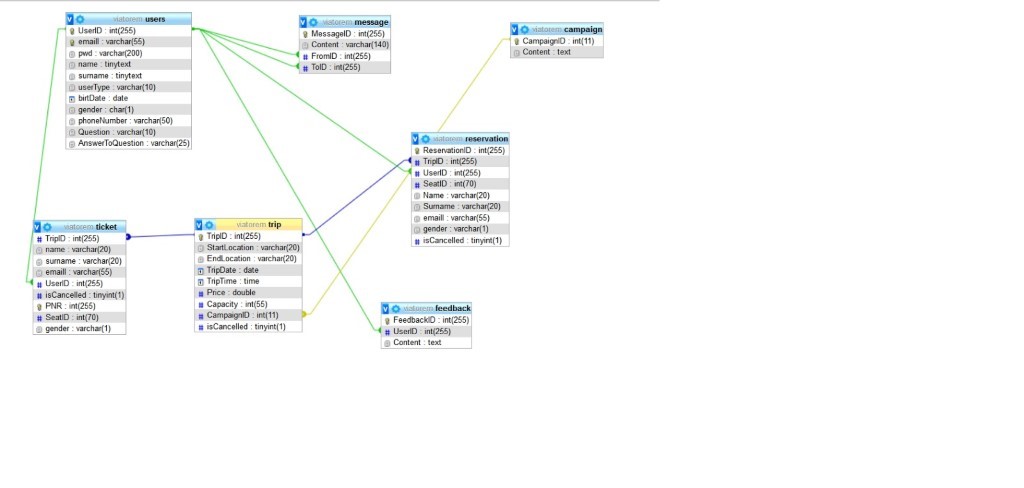


## Hardware Software Mapping



## Persistent Data Management

The system will persistantly store the information about users, trips, tickets bought, reservations made, campaigns, feedback to the website. This data will be accessed and changed by users who perform any function on the website. We will use MySQL Community Edition for relational database management.



The database schema is made of tables “Users” ,”Trip”, ”Ticket”, ”Reservation”, “Campaign”, “Feedback”, “Message”, “Bank”.

User table holds informations about user of the website, these informations include UserID, Email, Name, Surname, UserType for specifying whether the user is admin, officer or registered user, birthdate, gender, phone number, and ticket count.

Trip table holds information about every trip added to the system such as TripID, starting location, ending location, date, time, price and capacity of the trip.

Ticket table has information about tickets bought by users, these informations are PNR, TripID for specifying which trip the ticket is for, UserID for specifying which user it belongs to but only when user is registered so UserID can be null, and “cancelled” information to specify wheter the ticket is cancelled.

Reservation table has information about reservations made by users, these informations are ReservationID, TripID, UserID.

Campaign table holds information about campaigns added by the admin, it has CampaignID, starting date, ending date of campaign and content about campaign.

FeedBack table has information about the comments made by users about the website, it’s columns are FeedbackID, UserID and content.

Message table holds messages sent from users to the officer and officer to users, it’s columns are MessageID, FromID, ToID, content of the message.

Bank table holds information about bank accounts of every user, it has creditCard number and Balance for specifying amount of money a user has.

For the encapsulation of the database, data layer will have the TripInfo, TicketInfo, UserInfo components and will provide data through queries to the upper layers.

## Access Control and Security

|  |  |  |  |
| --- | --- | --- | --- |
|  | Administration | User | Viatorem |
| Admin | addCampaign ()  addTrip()  cancelTrip()  cancelTicket() | login()  logout() | viewTrip() |
| Registered User |  | login()  forgotPassword()  editProfile()  logout()  checkMailBox() | contactWithOfficer()  giveFeedback()  reserveTicket()  purchaseTicket()  cancelTicket()  viewMyAllTicketst()  seeHelp()  viewTrip()  seeCampaign() |
| User (Visitor) |  | register()  logout() | viewTicketDetail()  purchaseTicket()  cancelTicket()  seeHelp()  viewTrip()  seeCampaign() |
| Officer |  | checkMailBox()  logout() | sendMessage() |

User password is held encrypted in database and not even admin can see it. Credit card information is not held in database. Therefore there is no need for a further encryption.

## Global Software Control

Admin Interface that positioned at Interface Layer initializes login service, communication service, edit trip service that are responsible of adding trip, cancellation trip, view trip service and edit campaign service.

User Interface that positioned at Interface Layer initializes login service, registration service, buy ticket service that are responsible of buying ticket, contains buying ticket, cancellation ticket and reservation ticket which is let only by the registered users, communication service, edit account service that is also let only registered users and view trip service.

Officer Interface that positioned at Interface Layer initializes login service and communication service.

All of these services run on Application layer.

Login Subsystem controls logging into the system and each actor can log in system.

Registration Subsystem controls registration service and only visitors can execute the registration function.

Trip Management Subsystem controls edit trip service that includes adding a trip and cancellation trip and view trip service that allows to admin and user to view trips.

Ticket Management Subsystem controls buy ticket service which is includes buying/reservation ticket and cancellation ticket.

Campaign Subsystem controls edit campaign service that are initializes by only admin.

Communication Subsystem controls communication service which contains function of contacting between user and officer also admin.

User Management Subsystem controls edit account service which allows the registered user to execute some changing on their profile.

Data Layer has Trip Info Subsystem, Ticket Info Subsystem, User Info Subsystem, Message Info Subsystem. Trip Info Subsystem controls the trips’ data, Ticket Info Subsystem controls the tickets’ data, User Info Subsystem controls the user’s data and Message Info Subsystem controls the messages’ data.

## Boundary Conditions

For the Start-up the system runs on a computer.

Visitors can start browsing by entering the site address.

Visitors can register in the system after entering the required information.

The registered users enter the system with login information.

The error is given if the name and surname constraints are exceeding when registering .

The error is given if the username and password fields are empty.

The error is given if the username or password are incorrect.

# Subsystem Services

Login Service: Users can log in to the system through this service.

Registration Service: Visitors can register to the system through this service.

Buy Ticket Service: Users can buy or reserve tickets through this service.

Edit Ticket Service: Users can cancel their tickets through this service. Also admin can cancel user’s tickets if it is necessary.

Communication Services: Registered users and officer can communicate with each other through these services. Also Registered users can give feedbacks that are supervised by admin.

Edit Trip Service: Admin can add or cancel trips through this service.

Edit Account Service: Registered users can edit their account information through this service.

View Trip Service: Admin and users can view available trips through this service.

Edit Campaign Service: Admin can add or remove campaigns through this service.

# References

The following is an example of listing a book in this section. Check the text to see how it is cross referenced (The whole document is based on [1]).

1. Bruegge B. & Dutoit A.H.. (2010). *Object-Oriented Software Engineering Using UML, Patterns, and Java*, Prentice Hall, 3rd ed.