Deloitte USI Consulting Classroom Training

Final Project Report

QuickTicket.com: An online portal to book movie tickets

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1. Abstract

The emergence of a new digital economy is changing the ways in which businesses and development organizations engage. Transaction costs have been radically driven down, enabling greater inclusion. And technology is driving efficiency improvements, and permitting rapid scaling-up and transitional change.

The project "QuickTicket.com" is a web based application that allows the movie theatre owner and the viewers to handle all the cinema activities online quickly and safely. Using Interactive GUI anyone can quickly learn to use the complete system.

2. Introduction

Going to cinemas has been the culture of almost all the families of today's generation. It is a time when the family can spend some time altogether by stealing some hours from their busy schedule. Cinemas help in contributing in our daily memories as they provide an essential part of our culture.

But with most traditional businesses are undergoing digital transition, the traditional ticket reservation system is proving faulty and cumbersome. The modern user needs include pre booking, easy movie browsing and selection and finally a consolidated ticket details which makes the movie watching experience hassle-free and in true sense "entertainment".

This project is aimed at fulfilling those with the help of an online portal "QuickTicket.com".

The online movies ticket booking and reservation system provides facilities like booking and reserving tickets, seat management, and ticket cancellation. The system is simple and attractive which will make the audiences/viewers comfortable to use and choose their movie along with desired seat no and seat position.

The system allows the owner to keep track on available seats for a particular movie and even maintain various details of the audiences.

Viewers can view the movies which are being shown in the theatre or the ones which are going to be released for a short while along with their show timings and also book the tickets online.

3. Study of existing systems

India is one of the largest markets for movies in the world. India hasaround2400 Multiplex screens and around 6700 single screen theatres with big chains such as Inox and PVR which provide a wholesome movie watching experience with air conditioned screens and snack counters.

But with the advent of fast and cheap internet, the traditional ticket booking system of these theatres is falling short of providing a satisfactory services to its ever increasing set of consumers who turn to cinema to stress busting and entertainment but are faced with issues such as unavailability of seats, cancellation of shows and constantly changing show time.

The modern consumer is getting acquainted to easy access to various services through internet. They expect an easy way to book their movie tickets without the hassle of going to the theatre to book the tickets prior to the show and making a choice amongst the available few seats and then paying a higher price for it. Many a times consumers make an impromptu decision to go to the movies but no shows are running at that time or are houseful.

Faced with an increasing number of customers standing in long queues outside

The theatres, the theatre owners are faced the challenge of providing "Customer Delight".

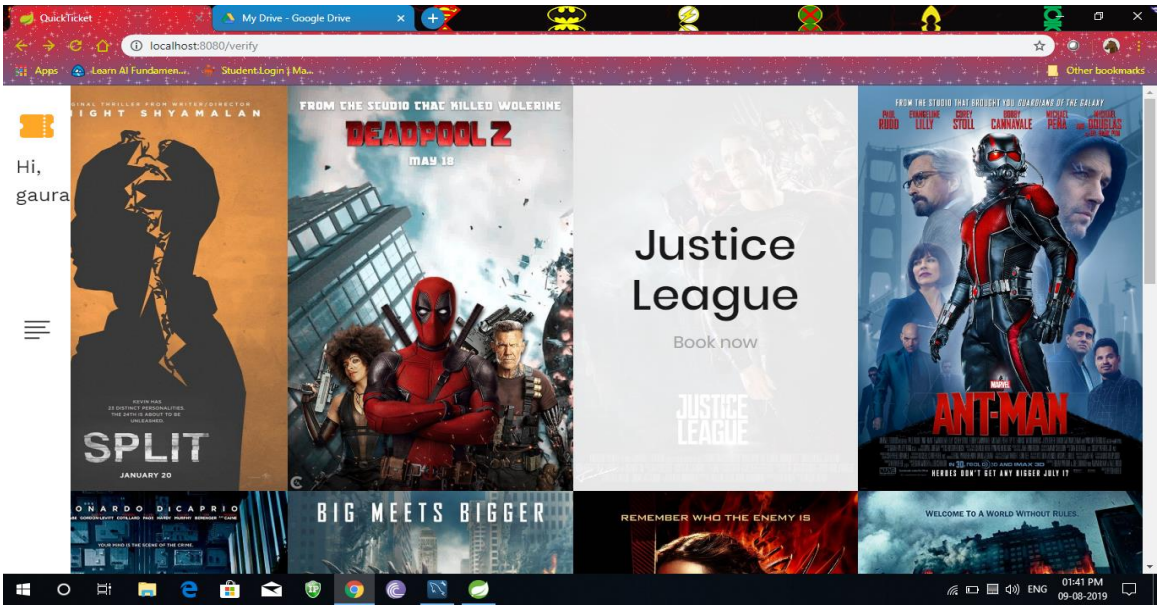
Customers desperately wanted an easy way of ordering and paying for their tickets without the delays and inconvenience of standing in long queues. The theatres also need to provide for promotional and membership services to help partners maximize their presence at the multiplexes. Many theatres had introduced phone booking but it was not to prove viable, as customers were often "no-shows", leading to un-sold seats. This affected business profits.

4. System Design of “QuickTicket.com”

4.1 User Interface

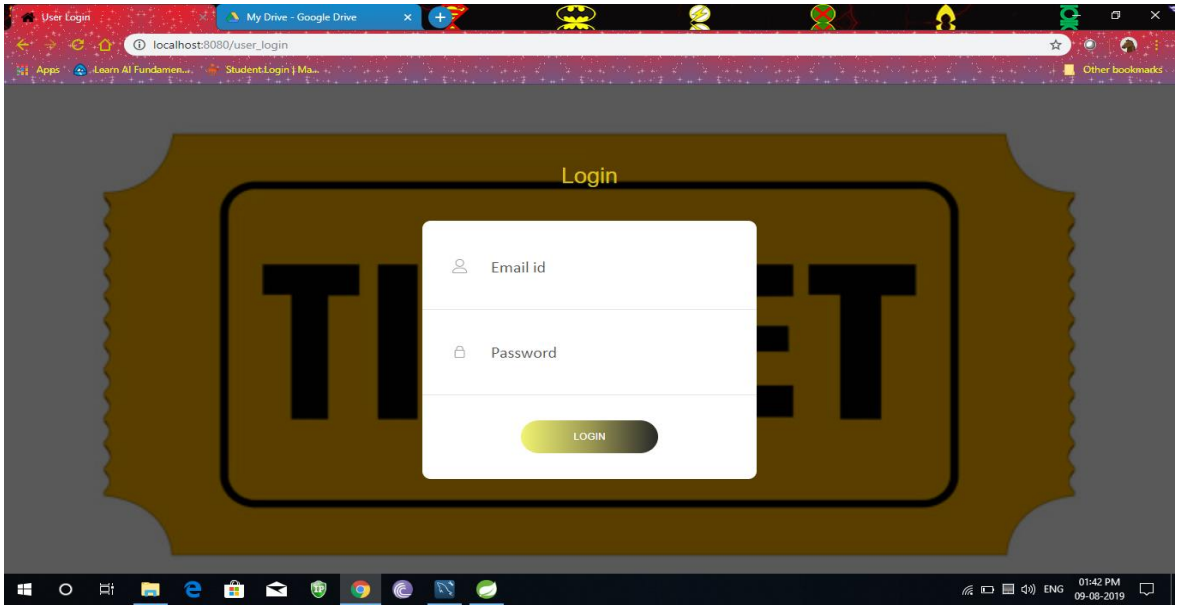
4.1.1 Welcome Page

The Welcome page starts with an array of movie posters displaying the range of all the movies that are currently running at the theatre. Hovering over individual poster displays the details of the movies. If you click on the movie name you are lead to the login page.



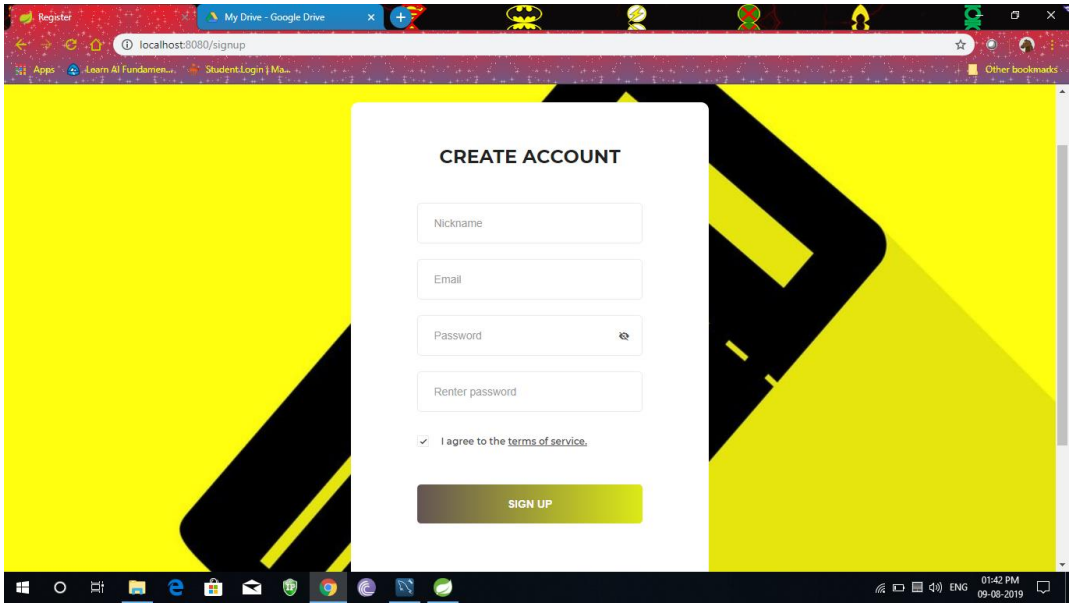
4.1.2 Login Page

For registered users there are fields to enter username and password and after authentication the user is taken back to the welcome page. There is an option for not registered users to register themselves.



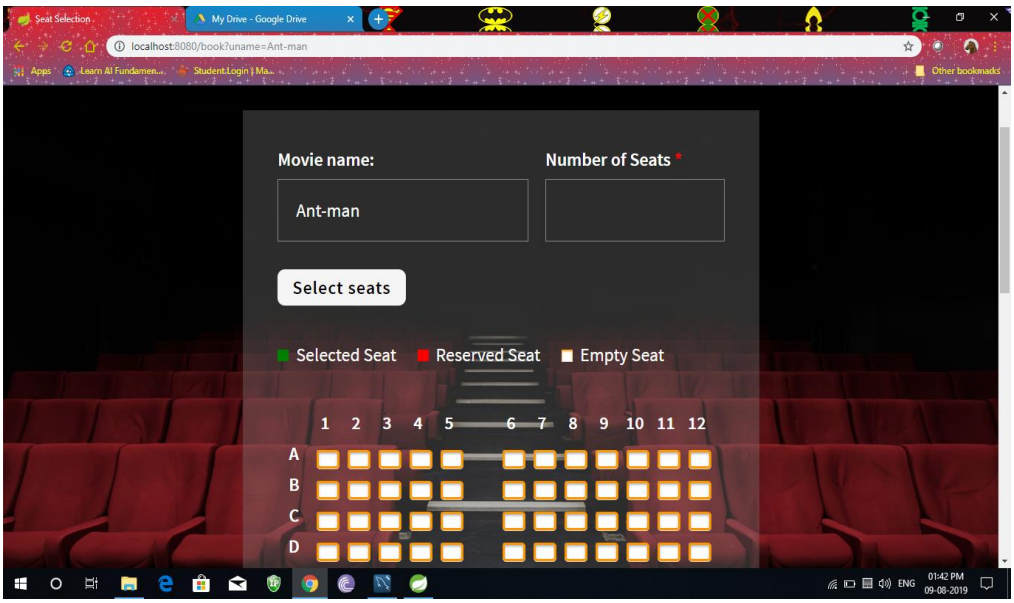
4.1.3 Register Page

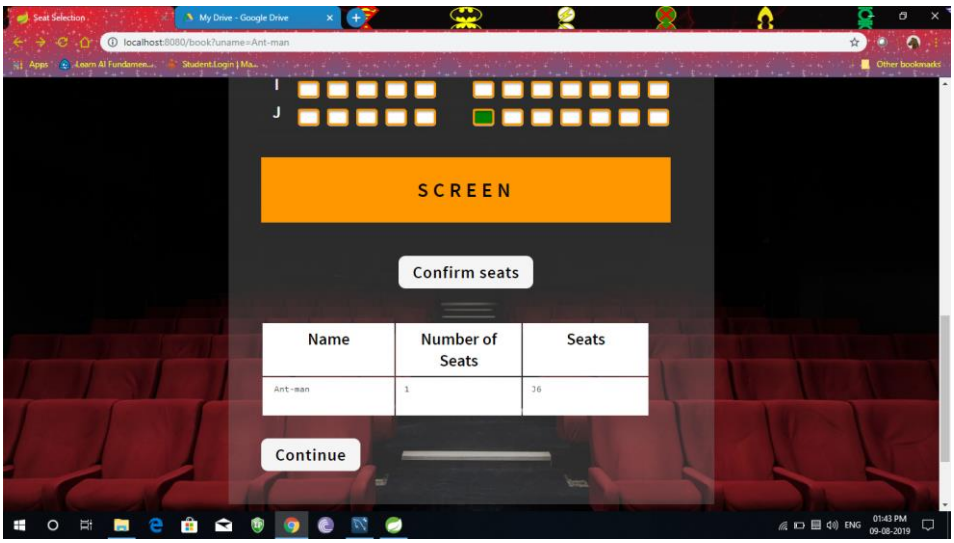
The register page has Fields for the user to enter necessary details including name and contact details and then set password. On confirming the details are stored on the database and the user is taken to login page.



4.1.4 Seat and Show selection

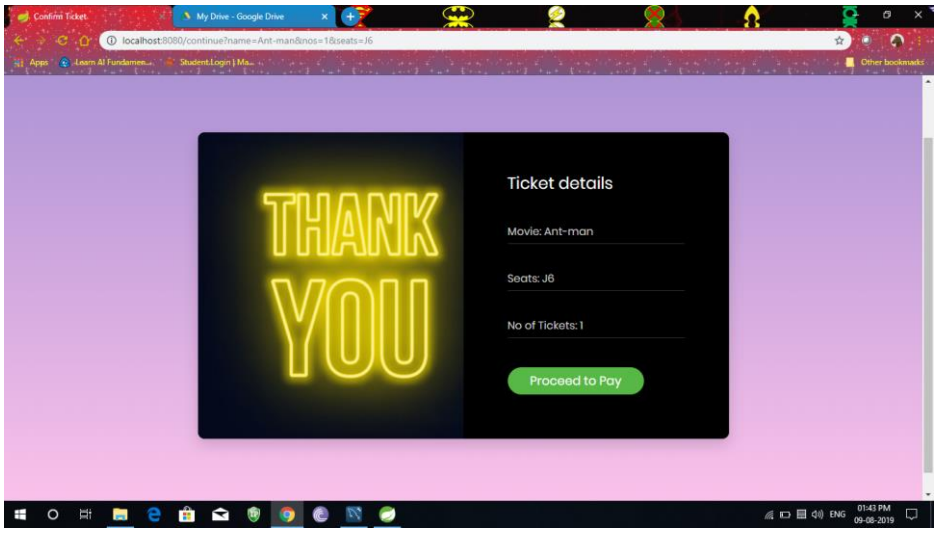
Once the user has finished login and selected the movie, they are led to the seat and show selection page, where they can enter the number of seats and then choose those seats in a representative image of the seating arrangement in the theatre by clicking on the seats. The seats are color coded. On confirming the seat selection the seat-number are displayed and the user can submit it.

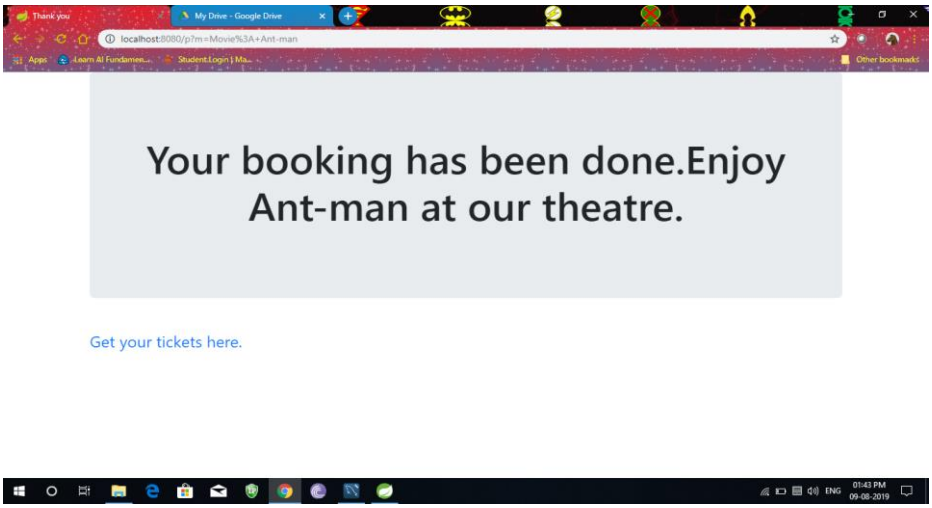


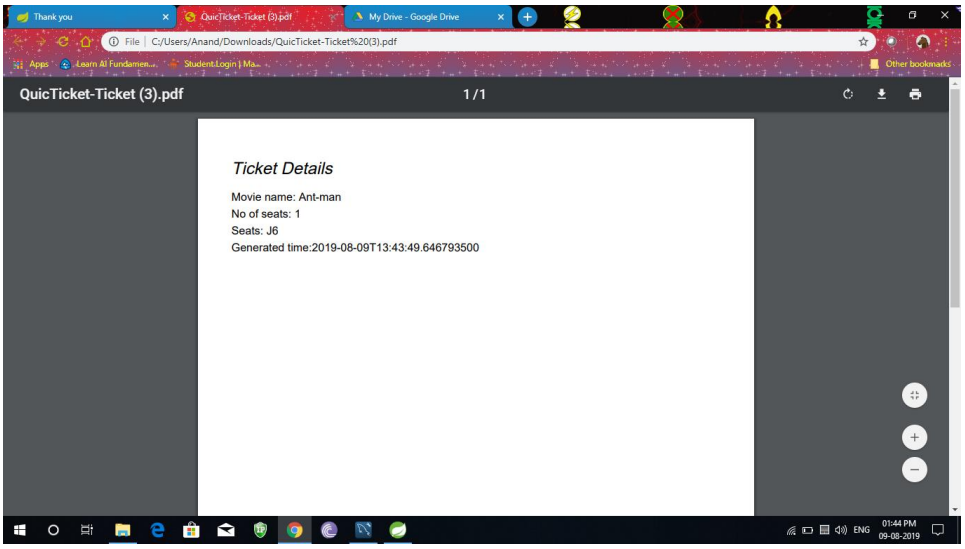


4.1.5 Final Page

On the final page a consolidated list of necessary details are displayed on the screen for the user to take note making the check in free of any issues. These details can be downloaded as a pdf file.







4.1.6 Technology used

The UI was developed using HTML 5. HTML 5 is a software solution stackthat defines the properties and behaviors of web page content by implementing a markup based pattern to it.

Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML5 is the next major revision of the HTML standard superseding HTML 4.01, XHTML 1.0, and XHTML 1.1. HTML5 is a standard for structuring and presenting content on the World Wide Web.

The new standard incorporates features like video playback and drag-and-drop that have been previously dependent on third-party browser plug-ins such as Adobe Flash, Microsoft Silverlight, and Google Gears.

JavaScript

JavaScript (**JS**) is a lightweight, interpreted, or just-in-time compiled programming language with first-class functions. JavaScript enables interactive web pages and is an essential part of web applications. JavaScript supports event-driven, functional, and imperative (including object-oriented and prototype-based) programming styles. It has APIs for working with text, arrays, dates, regular expressions, and the DOM.

JQuery

jQuery is a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation. It is free, open-source software using the permissive MIT License. Query's syntax is designed to make it easier to navigate a document, select DOM elements, create animations, and handle events. jQuery also provides capabilities for developers to create ins on top of the JavaScript library.

Bootstrap

Bootstrap is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains CSS- and (optionally) JavaScript-based design templates for typography, forms, buttons, navigation and other interface components.

Bootstrap is a web framework that focuses on simplifying the development of informative web pages (as opposed to web apps). The primary purpose of adding it to a web project is to apply Bootstrap's choices of color, size, font and layout to that project. As such, the primary factor is whether the developers in charge find those choices to their liking. Once added to a project, Bootstrap provides basic style definitions for all HTML elements. The end result is a uniform appearance for prose, tables and form elements across web browsers. In addition, developers can take advantage of CSS classes defined in Bootstrap to further customize the appearance of their contents. For example, Bootstrap has provisioned for light- and dark-colored tables, page headings, more prominent pull quotes, and text with a highlight. Bootstrap also comes with several JavaScript components in the form of jQuery plugins. They provide additional user interface elements such as dialog boxes, tooltips, and carousels. Each Bootstrap component consists of an HTML structure, CSS declarations, and in some cases accompanying JavaScript code. They also extend the functionality of some existing interface elements, including for example an auto-complete function for input fields.

4.2 Backend development

The backend development is done using java programming language with Spring-boot for web based application services with Hibernate for data persistence using the Eclipse IDE.

JPA: The Java Persistence API (JPA) is a specification of Java. It is used to persist data between Java object and relational database. JPA acts as a bridge between object-oriented domain models and relational database systems.

As JPA is just a specification, it doesn't perform any operation by itself. It requires an implementation. So, ORM tools like Hibernate, Top Link and iBatis implements JPA specifications for data persistence.

Hibernate: Hibernate is an Object/Relational Mapping solution for Java environments. The term Object/Relational Mapping refers to the technique of mapping data from an object model representation to a relational data model representation (and vice versa).

Hibernate not only takes care of the mapping from Java classes to database tables (and from Java data types to SQL data types), but also provides data query and retrieval facilities. It can significantly reduce development time otherwise spent with manual data handling in SQL and JDBC.

Spring Boot: Spring Boot provides a good platform for Java developers to develop a stand-alone and production-grade spring application that you can **just run**. You can get started with minimum configurations without the need for an entire Spring configuration setup.

Annotations used:

1. **@Entity** annotation marks a class as an entity bean, so it must have a no-argument constructor that is visible with at least protected scope.
2. The @Table annotation allows you to specify the details of the table that will be used to persist the entity in the database.
3. Each entity bean will have a primary key, which you annotate on the class with the **@Id** annotation.
4. By default, the @Id annotation will automatically determine the most appropriate primary key generation strategy to be used but you can override this by applying the **@GeneratedValue** annotation, which takes two parameters **strategy** and **generator.**
5. The @Column annotation is used to specify the details of the column to which a field or property will be mapped.
6. **@Bean** - indicates that a method produces a bean to be managed by Spring.
7. **@Repository** - indicates that an annotated class is a repository, which is an abstraction of data access and storage.
8. **@Controller** - marks the class as web controller, capable of handling the requests.
9. **@RequestMapping** - maps HTTP request with a path to a controller method.
10. **@Autowired** - marks a constructor, field, or setter method to be autowired by Spring dependency injection.
11. **@SpringBootApplication** - enables Spring Boot auto configuration and component scanning.
12. **@GetMapping** is specialized version of @RequestMapping annotation that acts as a shortcut for @RequestMapping(method = RequestMethod.GET). @GetMapping annotated methods handle the HTTP GET requests matched with given URI expression.
13. **@PostMapping** is specialized version of @RequestMapping annotation that acts as a shortcut for @RequestMapping(method = RequestMethod.POST). @PostMapping annotated methods handle the HTTP POST requests matched with given URI expression.

Thymeleaf : Thymeleaf is a modern server-side Java template engine for both web and standalone environments, capable of processing HTML, XML, JavaScript, CSS and even plain text.

The main goal of Thymeleaf is to provide an elegant and highly-maintainable way of creating templates. To achieve this, it builds on the concept of Natural Templates to inject its logic into template files in a way that doesn't affect the template from being used as a design

prototype. This improves communication of design and bridges the gap between design and development teams.

Thymeleaf has also been designed from the beginning with Web Standards in mind – especially HTML5 – allowing you to create fully validating templates if that is a need for you.

4.3 Data Base Structure

The data base consists of 7 Modules

4.3.1 Users Module

It consists the essential information as well as contact details of registered users. Its attributes are:

1. User_id: This is the individual and unique id used to map individual users.
2. User_name and password: It is used to authenticate registered users every time they login.
3. Email_id and Phone_no: These are used to store contact details of the consumers.

4.3.2 Movie module

It consists of the information about all the movies currently running at the theatre. Its attributes are:

1. Movie_id: It is individual id used to keep track of all the movies that are currently running in the theatre.
2. Movie_name and Description: It is used to store the name and description of the movie.

4.3.3 Shows Module

It holds the date and time information about the various shows along with the movie that is being shown. Its attributes are:

1. Show_id: It is used to map individual shows running in the current week.
2. Screen_id: It is used to indicate the screen at which the show is going to take place.
3. Movie_id: It indicates the movie that is being played.
4. Show_date and Show_time: It is used to store the date and time of the screening.

4.3.4 Seats Module

It is used to record the status of the seat, whether it’s booked or not for a given show which is mapped using the show id. Its attributes are:

1. Show_id: It maps indivual show from the shows table.
2. Seat_no: It is represents individual seats for a given show.
3. Status: It determines whether the seat is booked or not.

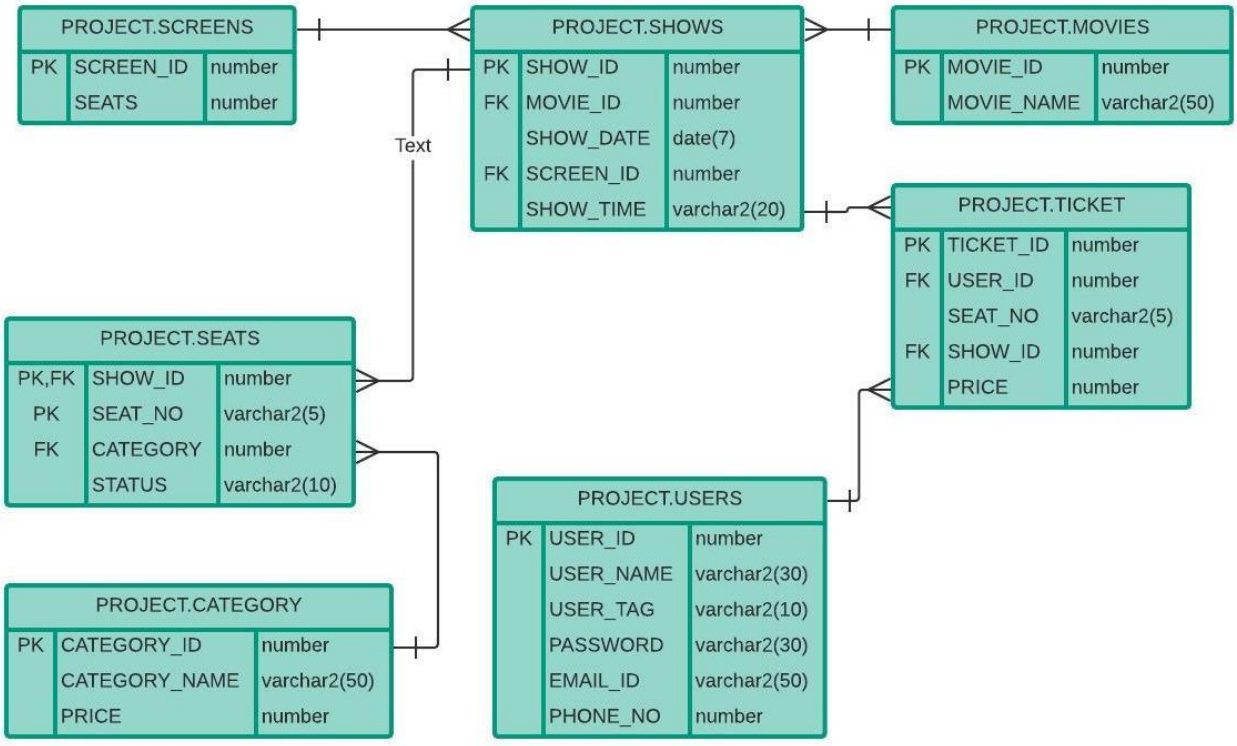
4. Category: The seats are usually divided into 2 or more categories with different price for each category.

4.3.5 Ticket Module

It is used to map every individual booking to a seat, show and user. It consolidates the information necessary for the user for an easy and quick check in. It also holds the price based on different seat categories. Its attributes are:

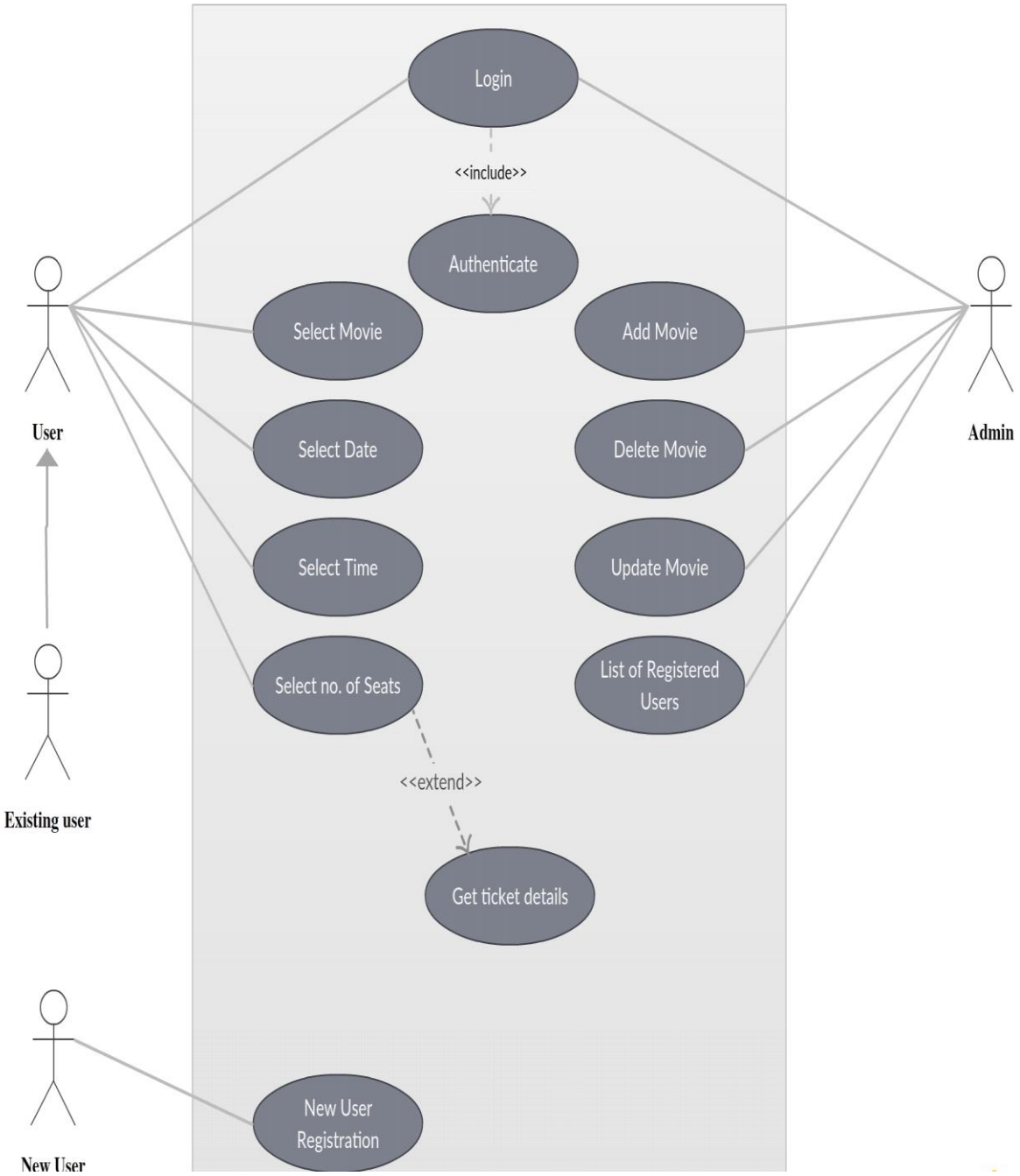
1. Ticket_id: It tracks individual tickets.
2. User_id, Show_id, Seat_no: These attributes are used to keep a consolidated record of all the details that are necessary for the user at check in.

4.3.6 UML Diagram



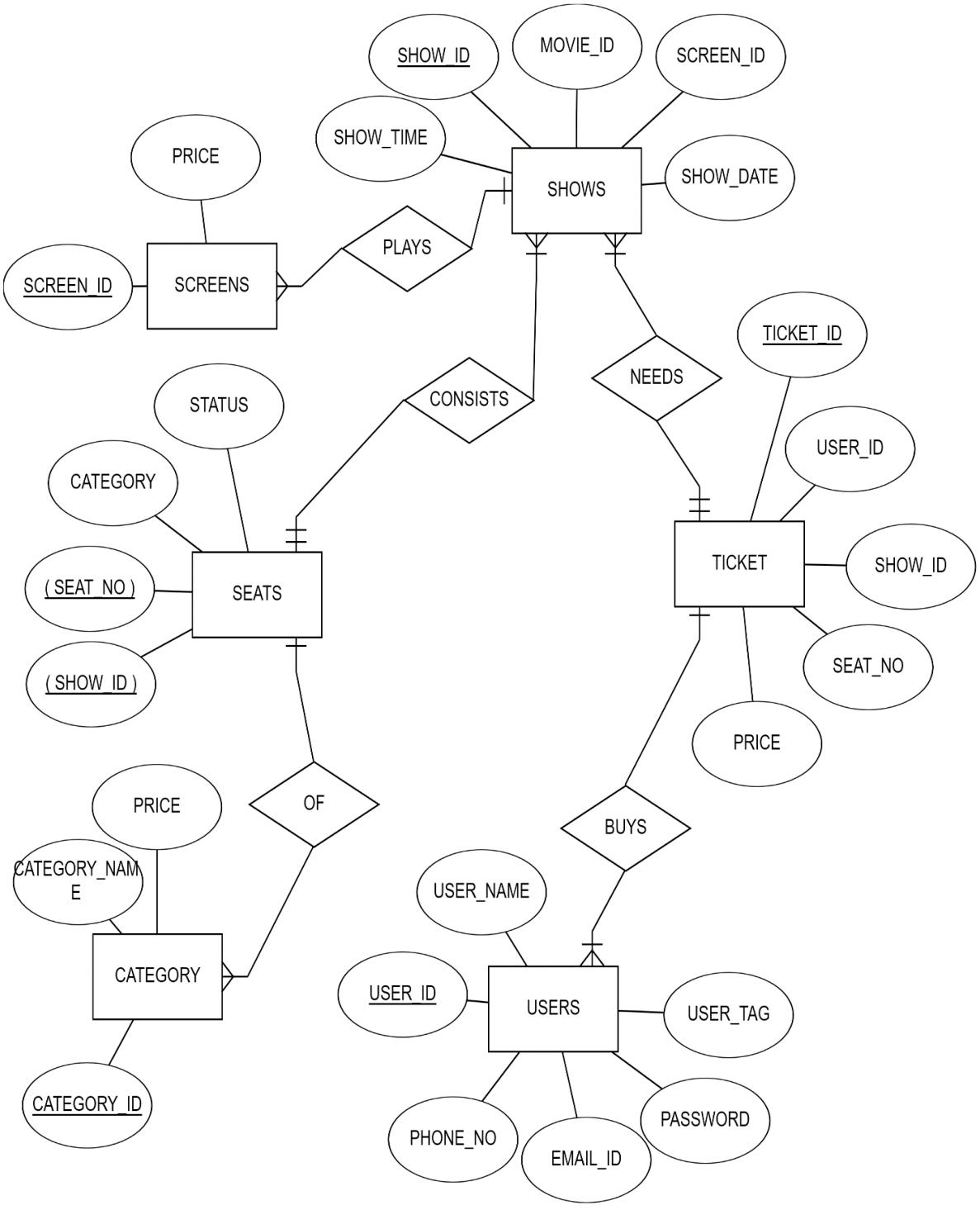
In the UML diagram, there are 7 classes, one for each module with primary key attributes as individual Ids as well as contact details for user, show date and time, seat status and ticket price. Further there are one to many relationship between certain classes. There are multiple shows for a single movie, multiple seats in a single show and a single user can book multiple seats.

4.3.7 Use-Case Diagram



In the above diagram, there are 3 actors, new users, existing users and the admin. The new users have to register to the system. The existing users can login using user-name and password which is authenticated by the system. Then the users can select movie, shows and seats. Further the system returns a consolidated ticket details for faster check in at the theatre.

4.3.8 Entity-Relationship Diagram



The above diagram represents 7 entities one for each class with their respective attributes. It also displays one-to-many relationship between certain entities. It provides a diagrammatic model of the data-base and the data flow in the system.

4.3.9 Technologies Used

MySQL is used to develop a database and store the necessary information. **MySQL** is an open-source relational database management system (RDBMS). MySQL is free and open-source software under the terms of the GNU General Public License. Major features as available in MySQL:

- Cross-platform support
- Stored procedures, using a procedural language that closely adheres to SQL/PSM
- Triggers
- Cursors
- Updatable views
- Online Data Definition Language (DDL) when using the InnoDB Storage Engine.
- Information schema
- Performance Schema that collects and aggregates statistics about server execution and query performance for monitoring purposes.
- A set of SQL Mode options to control runtime behavior, including a strict mode to better adhere to SQL standards.
- X/Open XA distributed transaction processing (DTP) support; two phase commit as part of this, using the default InnoDBstorage engine
- Transactions with save points when using the default InnoDB Storage Engine. The NDB Cluster Storage Engine also supports transactions.
- ACID compliance
- Query caching
- Sub-SELECTs (i.e. nested SELECTs)

5. How the application operates

1. New users who want to book tickets need to register their basic details and set a password for authentication which are stored in the database.
2. Existing users can enter their User-name and password which is verified by the system and then access the booking services.
3. On the homepage the user is displayed all the movies currently running at the theatre.
4. The user can browse through the range of movies and select the movie by clicking on the poster.
5. The user can then select a date and Showtime from the available shows.
6. Then the user is displayed a diagrammatic representation of the theatre hall with position of screens and seats color coded for different categories and already booked seats.
7. From the available seats the user can make a choice for one or more seats and then confirm that selection.
8. After seat selection, Show date, time and the seat numbers are consolidated and displayed together to make the cinema watching experience hassle free.
9. These details can be downloaded as a pdf file.

6. Conclusion

Nowadays, traditional reservation ways of cinema ticketing is dying. Its new age where technology dominates human life. With the software and technological devices, exceptions are reduced and even terminated. Also, people prefer easy, quick and safe way for every part of his life. This project provides an alternative to traditional ticket booking system. The web application developed provides the user an opportunity to browse movies at his own leisure via internet and further gives an opportunity to book tickets and select shows and seats easily. The UI is simple. It makes the entire procedure very simple and tickets are booked with a few clicks. The database which is developed with MySQL provides a storage for all data and mappings of relationship between these tables makes it easy to add and remove movies, register new user and authenticate the login. It is possible for user to browse through all the movies, easily make a choice of show and seats and finally a consolidated ticket data is stored for the ease of customer. Finally the backend development of servers was done using spring boot and hibernate connecting the database to the UI. With this platform we developed, we are hoping to reduce time wasting, avoid misunderstandings, provide easy data flow, customer pleasure, and less hard work.