

QR CODE BASED HALL TICKET

Submitted in partial fulfillment of requirement for the award of the Degree

Bachelor of Computer Science

In the faculty of Computer Science of Bharathiar University, Coimbatore

Submitted by

S.DIVYA

(Reg.No.2022K0125)

Under the guidance of

Mrs.N.SUGANTHI MCA.,M.Phil.,(Ph.D)

Lecturer, Department of Computer Science



Department of Computer Science

LRG GOVERNMENT ARTS COLLEGE FOR WOMEN

(Affiliated To Bharathiar University)

TIRUPUR-4

MAY-2023

CERTIFICATE

CERTIFICATE

This is to certify that the project work entitled “**QR CODE BASED HALL TICKET**” Submitted to Bharathiar University in partial fulfillment of the requirement for the award of the Degree of Bachelor of computer science is a record of the original work done by **Ms.S.DIVYA(Reg.No.2022K0151)** under my supervisor and that project work has not formed the basis for the any Degree /Diploma /Association /Fellowship or similar title to any candidate of any university.

Internal Guide

Mrs.N.SUGANTHI MCA.,M.Phil.,Ph.D

Head of the Department

Dr.R.PARIMALA MSc.,M.Phil.,Ph.D

Viva-voce examination is held on _____ L.R.G Government Arts College for Women, Tirupur-641604.

Internal Examiner

External Examiner

DECLARATION

DECLARATION

I hereby declare that the project work submitted to the **Department of the Computer Science, L.R.G. Government Arts College for Women, Tirupur** , affiliated to Bharathiar University, Coimbatore in the partial fulfillment of the required for the award of Bachelor of Computer Science is an original work done by me during the sixth semester.

Place:

Date:

Signature of the candidate

(S.DIVYA)

(Reg. No:2022K0125)

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SYNOPSIS

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The project entitled as “QR Code Based Hall ticket System” has developed using JAVA as front end and My SQL server as back end. This project is being created to decrease the effort of human and forgery in hall tickets in the educational institutes. The hall ticket is fully based on the Quick Response (QR) code, which is a new embedding technique. This project is the pure automated solution and it will help to generate student hall ticket easily. It is a special type of software which will be used to make a secure hall ticket with QR code instead of the bar code. In current scenario, educational institutes have different types of examinations. For all these they need to distribute hall ticket. In the existing system, there are printed hall tickets are used. So any one can forge and make malpractice over the printed copies.

CHAPTER 1

1. INTRODUCTION

1.1 ORGANIZATION PROFILE

Tata Consultancy Services Ltd (TCS), a subsidiary of Tata Sons Pvt Ltd, is a provider of information technology (IT) services. It offers IT infrastructure services, engineering, and industrial services, business intelligence, business process outsourcing, and consulting services, cloud services, quality engineering, block chain, enterprise solutions, and IoT. The company offers business solutions to various industries, including banking, financial services, communication, media, technology, insurance, life sciences and healthcare, retail, consumer goods and distribution, manufacturing, information services, Hi-Tech, education, energy and utilities, life sciences, healthcare, travel, transportation, and hospitality. Its software products comprise TCS BaNCS, Ignio, TAP, TCS iON, TCS TwinX, TCS Optumera, TCS OmniStore, TCS ADD, TCS HOBS, Quartz, Jile, and TCS MasterCraft. The company has operations across Latin America, North America, Europe, Asia-Pacific, the Middle East, and Africa. TCS is headquartered in Mumbai, Maharashtra, India.

TCS offers a consulting-led, cognitive-powered, integrated portfolio of business, technology, and engineering services and solutions. This is delivered through its unique Location Independent Agile™ delivery model, recognized as a benchmark of excellence in software development.

A part of the Tata group, India's largest multinational business group, TCS has over 592,000 of the world's best-trained consultants in 55 countries. The company generated consolidated revenues of US \$25.7 billion in the fiscal year ended March 31, 2022, and is listed on the BSE (formerly Bombay Stock Exchange) and the NSE (National Stock Exchange) in India.

1.2 SYSTEM SPECIFICATION

System Requirements Specification also known as Software Requirements Specification, is a document or set of documentation that describes the features and behavior of a software application

WINDOWS OS

Windows is a graphical operating system developed by Microsoft. It allows users to view and store files, run the software, play games, watch videos, and provides a way to connect to the internet. It was released for both home computing and professional works.

Microsoft introduced the first version as 1.0

It was released for both home computing and professional functions of Windows on 10 November 1983. Later, it was released on many versions of Windows as well as the current version, Windows 10.

In 1993, the first business-oriented version of Windows was released, which is known as Windows NT 3.1. Then it introduced the next versions, Windows 3.5, 4/0, and Windows 2000. When the XP Windows was released by Microsoft in 2001, the company designed its various versions for a personal and business environment. It was designed based on standard x86 hardware, like Intel and AMD processor. Accordingly, it can run on different brands of hardware, such as HP, Dell, and Sony computers, including home-built PCs.

Play Video

Editions of Windows

Microsoft has produced several editions of Windows, starting with Windows XP. These versions have the same core operating system, but some versions included advance features with an additional cost. There are two most common editions of Windows:

- Windows Home
- Windows Professional

Windows Home is basic edition of Windows. It offers all the fundamental functions of Windows, such as browsing the web, connecting to the Internet, playing video games, using office software, watching videos. Furthermore, it is less expensive and comes pre-installed with many new computers.

JAVA

Java is a high-level programming language developed by Sun Microsystems. It was originally designed for developing programs for set-top boxes and handheld devices, but later became a popular choice for creating web applications.

The Java syntax is similar to C++, but is strictly an object-oriented programming language. For example, most Java programs contain classes, which are used to define objects, and methods, which are assigned to individual classes. Java is also known for being stricter than C++, meaning variables and functions must be explicitly defined. This means Java source code may produce errors or "exceptions" more easily than other languages, but it also limits other types of errors that may be caused by undefined variables or unassigned types.

Unlike Windows executable (.EXE files) or Macintosh applications (.APP files), Java programs are not run directly by the operating system. Instead, Java programs are interpreted by the Java Virtual Machine, or JVM, which runs on multiple platforms. This means all Java programs are multiplatform and can run on different platforms, including Macintosh, Windows, and Unix computers. However, the JVM must be installed for Java applications or applets to run at all. Fortunately, the JVM is included as part of the Java Runtime Environment (JRE),

MYSQL

MySQL is an Oracle-backed open source relational database management system (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX and Windows. Although it can be used in a wide range of applications, MySQL is most often associated with web applications and online publishing.

MySQL is an important component of an open source enterprise stack called LAMP. LAMP is a web development platform that uses Linux as the operating system, Apache as the web server, MySQL as the relational database management system and PHP as the object-oriented scripting language. (Sometimes Perl or Python is used instead of PHP.)

Originally conceived by the Swedish company MySQL AB, MySQL was acquired by Sun Microsystems in 2008 and then by Oracle when it bought Sun in 2010. Developers can use MySQL under the GNU General Public License (GPL), but enterprises must obtain a commercial license from Oracle.

Relational database management systems use structured query language (SQL) to store and manage data. The system stores multiple database tables that relate to each other. MS SQL Server, MySQL, or MS Access are examples of relational database management systems. The following are the components of such a system.

A SQL table is the basic element of a relational database. The SQL database table consists of rows and columns. Database engineers create relationships between multiple database tables to optimize data storage space.

SQL statements, or SQL queries, are valid instructions that relational database management systems understand. Software developers build SQL statements by using different SQL language elements. SQL language elements are components such as identifiers, variables, and search conditions that form a correct SQL statement.

1.2.1 HARDWARE SPECIFICATION

- Processor : P 4 700 GHz.
- RAM : 4 GB RAM
- Hard Disk Drive : 180 GB

1.2.2 SOFTWARE SPECIFICATION

- Operating System : Windows 7/8/10
- Front End : JAVA
- Back End : MYSQL

CHAPTER 2

SYSTEM STUDY

2.1 EXISTING SYSTEM

The existing system of hall ticket the student should taken the hall ticket before reaching the exam hall. If student might be forget to took the hall ticket before the exam hall or before leaving from home it may cause unnecessary problem. We can avoid this issue using our digitalized hall ticket.

2.1.1 DRAWBACKS

- Virtual hall ticket chance for lost or broke the ticket.
- It's not comfortable on pressure situation.
- Need to spend money to print the hall ticket.

2.2 PROPOSEDSYSTEM

Our system to be modify the hall ticket generation as an digitalized. The teacher can scan using some third party application to scan the QR code. The QR code will be showing the details of the student and then teacher can verify the details.

2.2.1 FEATURES

- No need to carry the ticket in hand
- No need to handle safely because of its digitalized
- Avoid the cost of the hall ticket

CHAPTER 3

SYSTEM DESIGN AND DEVELOPMENT

3.1 FILE DESIGN

The selection of the file system design approach is done according to the needs of the developers what are the needed requirements and specifications for the new design. It allowed us to identify where our proposal fitted in with relation to current and past file system development. Our experience with file system development is limited so the research served to identify the different techniques that can be used. The variety of file systems encountered show what an active area of research file system development is. The file systems may be from one of the two fundamental categories. In one category, the file system is developed in user space and runs as a user process. Another file system may be developed in the kernel space and runs as a privileged process. Another one is the mixed approach in which we can take the advantages of both aforesaid approaches. Each development option has its own pros and cons. In this article, these design approaches are discussed.

A file system is the data structure designed to support the abstraction of the data blocks as an archive and collection of files. This data structure is unique because it is stored on secondary storage (usually the disk), which is a very slow device.

The file system structure is the most basic level of organization in an operating system. Almost all of the ways an operating system interacts with its users, applications, and security model are dependent upon the way it organizes files on storage devices.

File Design Information systems in business are file and database oriented. Data are accumulated into files that are processed or maintained by the system. The systems analyst is responsible for designing files, determining their contents and selecting a method for organizing the data.

The most important purpose of a file system is to manage user data. This includes storing, retrieving and updating data. Some file systems accept data for storage as a stream of bytes which are collected and stored in a manner efficient for the media.

3.2 INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:’

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

- Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.
- It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.
- When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user
- will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

3.3 OUTPUT DESIGN

The design of output is the most important task of any system. During output design, developers identify the type of outputs needed, and consider the necessary output controls and prototype report layouts.

External Outputs

Manufacturers create and design external outputs for printers. External outputs enable the system to leave the trigger actions on the part of their recipients or confirm actions to their recipients.

Some of the external outputs are designed as turnaround outputs, which are implemented as a form and re-enter the system as an input.

Internal outputs

Internal outputs are present inside the system, and used by end-users and managers. They support the management in decision making and reporting.

Output Integrity Controls

Output integrity controls include routing codes to identify the receiving system, and verification messages to confirm successful receipt of messages that are handled by network protocol.

Printed or screen-format reports should include a date/time for report printing and the data. Multipage reports contain report title or description, and pagination. Pre-printed forms usually include a version number and effective date.

3.4 DATABASE DESIGN

Today's businesses depend on their databases to provide information essential for day-to-day operations, especially in case of electronic commerce businesses who has a definite advantage with up-to-date database access. Good design forms the foundation of any database, and experienced hands are required in the automation process to design for optimum and stable performance.

Software Solutions have been constantly working on these platforms and have attained a level of expertise. We apply proven methodologies to design, develop, integrate and implement database systems to attain its optimum level of performance and maximize security to meet the client's business model.

Business needs addressed:

- Determine the basic objects about which the information is stored
- Determine the relationships between these groups of information and the objects
- Effectively manage data and create intelligent information
- Remote database administration or on site administrative support
- Database creation, management, and maintenance
- Information retrieval efficiency, remove data redundancy and ensure data security

The most important consideration in designing the database is how the information will be used. The main objective of designing a database is Data Integration, Data Integrity and Data Independence.

Data Integration

In a database information from several files is coordinated, accessed and operated upon as through it is in a single file. Logically, the information is centralized physically the data may be located on different devices, connected through data communication facilities.

Data Integrity

Data integrity means storing all data in one place only and how each application accesses it. This approach results in more consistent information, one update being sufficient to achieve a new record status for all applications. This leads to less data redundancy that is data items need not be duplicated.

Data Independence

Data independence is the insulation of application programs from changing aspects of physical data organization. This objective seeks to allow changes in the content and organization of physical data without reprogramming of application and allow modifications to application programs without reorganizing the physical data.

3.5 SYSTEM DEVELOPMENT

Systems development is the process of defining, designing, testing, and implementing a new software application or program. It could include the internal development of customized systems, the creation of database systems, or the acquisition of third party developed software.

Systems development life cycle phases include planning, system analysis, system design, development, implementation, integration and testing, and operations and maintenance.

3.5.1 DESCRIPTION OF MODULES

Teacher / Admin Login

Teacher or Admin has the login credential and they have to be login in to this application. For the security reason they should login and access this application. The login details are stored in a database when the admin or teacher trying to login it can refer from the login table.

Student Registration

The college staff only able to register the student details, before that they should collect all the information from the student and they can register. These details are stored in a student table. Once the details are stored then student have own access to login into this application.

Hall Ticket Registration

After the student registration has been completed, the admin registered the hall ticket details. This record will be stored in to the hall ticket table. Once the ticket has been registered then the QR code has been generated.

QR Code Generation

QR Code will be generated and viewed into the server, when student login into the application it will can show into the hall ticket details screen.

Student Login

Once the student registration has been completed, then they have unique username and password. Which fields are collect the information from the student table. If the username or password is incorrect, we won't allow entering into the application.

View Hall Ticket

Student can able to view the hall ticket as a QR code. When student reached the exam hall the teachers scanning the QR code view the student details accordingly

CHAPTER 4

TESTING AND IMPLEMENTATION

TESTING METHODOLOGIES

System testing is state of implementation, which is aimed at ensuring that the system works accurately and efficiently as expect before live operation commences. It certifies that the whole set of programs hang together.

System testing requires a test plan that consists of several key activities and step for run program, string, system and user acceptance testing. The implementation of newly designed package is important in adopting a successful new system

Testing is the important stage in software development. the system test in implementation stage in software development process. The system testing implementation should be confirmation that all is correct and an opportunity to show the users that the system works as expected. It accounts the largest percentage of technical effort in the software development process.

Testing phase in the development cycle validates the code against the functional specification testing is vital to achievement of the system goals. The objective of the testing is to discover errors to fulfill this objective a series of test step unit, integration. Validation and system tests were planned and executed the test steps are:

SYSTEM TESTING

Testing is an integral part of any system development life cycle. Insufficient and untested applications may tend to crash and the result is loss of economic and manpower investment besides user's dissatisfaction and downfall of reputation. Software testing can be looked upon as one among many processes, an organization performs, and that provides the lost opportunity to correct any flaws in the developed system. Software testing includes selecting test data that have more probability of giving errors.

The first step in system testing is to develop a plan that tests all aspects of the system. Completeness, correctness, reliability and maintainability of the software are to be tested for the best quality assurance that the system meets the specification and requirements for its intended use and performance. System testing is the most useful practical process of executing a program with the implicit intention of finding errors that make the program fails. System testing is done in three phases.

- Unit Testing
- Integration Testing
- Validation Testing

UNIT TESTING

Unit testing focuses verification effort on the smallest unit of software the module. Using the detailed design and the process specification testing is done to registration by the user with in the boundary of the Login module. The login form receives the username and password details and validates the value with the database. If valid, the home page is displayed.

INTEGRATION TESTING

Integration Testing is the process of this activity can be considered as testing the design and hence module interaction. The primary objective of integration testing is to discover or is in the interfaces between the components. Login form and registration form are integrated and tested together. If the user is newly registered, the received details will be stored in the registration table. While logging in, the application will check for valid user name and password in the registration table and if valid the user is prompted for submitting complaints.

Data can be lost across an interface, one module can have adverse effect on another sub function when combined it may not produce the desired major functions. Integration testing is a systematic testing for constructing test to uncover errors associated within an interface.

The objectives taken from unit tested modules and a program structure is built for integrated testing. All the modules are combined and the test is made.

A correction made in this testing is difficult because the vast expenses of the entire program complicated the isolation of causes. In this integration testing step, all the errors are corrected for next testing process.

VALIDATION TESTING

Validation are independent procedures that are used together for checking that a product, service, or system meets requirements and specifications and that it fulfills its purpose the actual result from the expected result for the complaint process. Select the complaint category of the complaint by user. The input given to various forms fields are validated effectively. Each module is tested independently. It is tested that the complaint module fields receive the correct input for the necessary details such as complaint category, complaint id, reference name, complaint description, and email for further process.

After the completion of the integrated testing, software is completely assembled as a package; interfacing error has been uncovered and corrected and a final series of software test validation begins.

Validation testing can be defined in many ways but a simple definition is that validation succeeds when the software function in a manner that can be reasonably expected by the customer. After validation test has been conducted, one of two possible conditions exists.

OUTPUT TESTING

The next process of validation testing, is output testing of the proposed system, since no system could be successful if it does not produce the required output in the specified format. Asking the user about the format required, list the output to be generated or displayed by the system under considerations.

Output testing is a different test whose primary purpose is to fully exercise the computer based system although each test has a different purpose all the work should verify that all system elements have been properly integrated and perform allocated functions.

The output format on the screen is found to be corrected as the format was designed in the system design phase according to the user needs for the hard copy also; the output testing has not resulted in any correction in the system.

SYSTEM IMPLEMENTATION

When the initial design was done for the system, the client was consulted for the acceptance of the design so that further proceedings of the system development can be carried on. After the development of the system a demonstration was given to them about the working of the system. The aim of the system illustration was to identify any malfunction of the system.

After the management of the system was approved the system implemented in the concern, initially the system was run parallel with existing manual system. The system has been tested with live data and has proved to be error free and user friendly.

Implementation is the process of converting a new or revised system design into an operational one when the initial design was done by the system; a demonstration was given to the end user about the working system.

This process is used to verify and identify any logical mess working of the system by feeding various combinations of test data. After the approval of the system by both end user and management the system was implemented.

System implementation is made up of many activities. The six major activities are as follows.

CODING

Coding is the process of whereby the physical design specifications created by the analysis team turned into working computer code by the programming team. A design code may be a tool which helps ensure that the aspiration for quality and quantity for customers and their requirements, particularly for large scale projects, sought by the water agency Design pattern are documented tried and tested solutions for recurring problems in a given context. So basically you have a problem context and the proposed solution for the same.

INSTALLATION

Installation is the process during which the current system is replaced by the new system. This includes conversion of existing data, software, and documentation and work procedures to those consistent with the new system.

DOCUMENTATION

Documentation is descriptive information that describes the use and operation of the system. The user guide is provided to the end user as the student and administrator. The documentation part contains the details as follows,

User requirement and water agency details administration has been made online. Any customer can request their water requirement details through online and also use of documentation, they can view the purpose of each purpose, The admin could verify the authentication of the users, users requirements and need to take delivery process, thus the documentation is made of full view of project thus it gives the guideline to study the project and how to execute also.

USER TRAINING AND SUPPORT

The software is installed at the deployment environment, the developer will give training to the end user of the regional transport officer and police admin officer in that software. The goal of an end user training program is to produce a motivated user who has the skills needed to apply what has been to apply what has been learned to perform the job related task. The following are the instruction which is specified the handling and un-handling events in the application,

- The authenticated user of admin and office workers only login in the application with authorized username and password.
- Don't make user waste their time to come straight to the water agency or make a phone call.
- It can easily track through online by the user.
- Very user friendliness software

IMPLEMENTATION PROCEDURES

Implementation includes all the activities that take place to convert the old system to the new one. Proper implementation is essential to provide a reliable system to meet the organization requirements. Implementation is the stage in the project where the theoretical design is turned into a working system. The most crucial stage is achieving a successful new system & giving the user confidence in that the new system will work efficiently & effectively in the implementation state.

IMPLEMENTATION PROCEDURES

PILOT RUNNING

Processing the current data by only one user at a time called the pilot running process. When one user is accessing the data at one system, the system is set to be engaged and connected in network. This process is useful only in system where more than one user is restricted.

PARALLEL RUNNING:

Processing the current data by more than one user at a time simultaneously is said to be parallel running process. This same system can be viewed and accessed by more than one user at the time. Hence the implementation method used in the system is a pilot type of implementation.

Implementation is the stage in the project where the theoretical design is turned into a working system. The most crucial stage is achieving a successful new system & giving the user confidence in that the new system will work efficiently & effectively in the implementation state.

The stage consists of,

- Testing the developed program with sample data.
- Detection's and correction of error.
- Creating whether the system meets user requirements.
- Making necessary changes as desired by the user.
- Training user personnel.

USER TRAINING

User Training is designed to prepare the user for testing & consenting the system. .

- User Manual.
- Help Screens.
- Training Demonstration.

USER MANUAL

The summary of important functions about the system and software can be provided as a document to the user.

HELP SCREENS

This features now available in every software package, especially when it is used with a menu. The user selects the “Help” option from the menu. The system accesses the necessary description or information for user reference.

TRAINING DEMONSTRATION:

Another User Training element is a Training Demonstration. Live demonstrations with personal contact are extremely effective for Training Users.

SYSTEM MAINTENANCE

Maintenance is actually the implementation of the review plan. As important as it is, many programmers and analysts are to perform or identify themselves with the maintenance effort. There are psychological, personality and professional reasons for this. Analysts and programmers spend far more time maintaining programs than they do writing them. Maintenance accounts for 50-80 percent of total system development

Maintenance is expensive. One way to reduce the maintenance costs are through maintenance management and software modification audits.

- Maintenance is not as rewarding as exciting as developing systems. It is perceived as requiring neither skill nor experience.
- Users are not fully cognizant of the maintenance problem or its high cost.
- Few tools and techniques are available for maintenance.
- A good test plan is lacking.
- Standards, procedures, and guidelines are poorly defined and enforced.
- Programs are often maintained without care for structure and documentation.
- There are minimal standards for maintenance.
- Programmers expect that they will not be in their current commitment by time their programs go into the maintenance cycle.

Corrective Maintenance

It means repairing, processing or performance failure or making changes because of previously uncovered problems or false assumptions. Task performed to identify, isolate, and rectify a fault so that the failed equipment, machine, or system can be restored to an operational condition within the tolerances or limits established for in-service operations.

Corrective maintenance can be subdivided into "immediate corrective maintenance" (in which work starts immediately after a failure) and "deferred corrective maintenance" (in which work is delayed in conformance to a given set of maintenance rules).

Perfective Maintenance

It means changes made to a system to add new features or to improve performance. Preventive maintenance is predetermined work performed to a schedule with the aim of preventing the wear and tear or sudden failure of equipment components. process or control equipment failure can have adverse results in both human and economic terms. In addition to down time and the costs involved to repair and/or replace equipment parts or components, there is the risk of injury to operators, and of acute exposures to chemical and/or physicals.

Time-based or run-based Periodically inspecting, servicing, cleaning, or replacing parts to prevent sudden failure .On-line monitoring of equipment in order to use important/expensive parts to the limit of their serviceable life. Preventive maintenance involves changes made to a system to reduce the chance of future system failure.

An example of preventive maintenance might be to increase the number of records that a system can process far beyond what is currently needed or to generalize how a system sends report information to a printer so that so that the system can adapt to changes in printer technology.

Preventive Maintenance

Changes made to a system to avoid possible future problems Perfective maintenance involves making enhancements to improve processing performance, interface usability, or to add desired, but not necessarily required, system features. The objective of perfective maintenance is to improve response time, system efficiency, reliability, or maintainability.

During system operation, changes in user activity or data pattern can cause a decline in efficiency, and perfective maintenance might be needed to restore performance. Usually, the perfective maintenance work is initiated by the IT department, while the corrective and adaptive maintenance work is normally requested by users.

CHAPTER 5

CONCLUSION

QR code-based hall tickets are a modern and innovative way to manage the examination process for educational institutions. These hall tickets contain a unique QR code that can be scanned using a smartphone or a QR code reader to verify the identity of the student and their examination details.

QR code-based hall tickets offer several benefits, including enhanced security, convenience, and accuracy. By incorporating a unique QR code, these hall tickets are virtually impossible to replicate, ensuring that only genuine students are allowed to take the exam. This reduces the risk of fraud and cheating, ensuring the integrity of the examination process.

Moreover, QR code-based hall tickets are convenient for both students and examiners. Students can easily access and carry their hall tickets on their mobile devices, eliminating the need for printed hall tickets. Examiners can quickly and accurately verify the identity of the student and their examination details by scanning the QR code.

QR code-based hall tickets also offer improved accuracy in the examination process. By eliminating the need for manual data entry, errors can be reduced, ensuring that the correct information is recorded for each student.

In conclusion, QR code-based hall tickets are an innovative and efficient way to manage the examination process for educational institutions. These hall tickets offer several benefits, including enhanced security, convenience, and accuracy. Educational institutions can leverage these benefits to ensure the integrity of the examination process, provide a better experience for students, and improve the accuracy of examination data.

BIBLIOGRAPHY

Book Reference:

- Bloch, Joshua. Effective Java: Programming Language Guide. Addison-Wesley, 2017.
- Eckel, Bruce. Thinking in Java. Prentice Hall, 2006.
- Freeman, Eric, and Elisabeth Robson. Head First Java. O'Reilly Media, 2005.
- Horstmann, Cay S. Core Java Volume I--Fundamentals. Prentice Hall, 2018.
- Lea, Doug. Concurrent Programming in Java: Design Principles and Patterns. Addison-Wesley, 2000.
- Naftalin, Maurice, and Philip Wadler. Java Generics and Collections. O'Reilly Media, 2006.
- Shildt, Herbert. Java: A Beginner's Guide. McGraw-Hill Education, 2018.
- Sierra, Kathy, and Bert Bates. Head First Java, 2nd Edition. O'Reilly Media, 2005.
- Subramaniam, Venkat. Functional Programming in Java: Harnessing the Power of Java 8 Lambda Expressions. Pragmatic Bookshelf, 2014.
- Walrath, Kathy, et al. The Java Tutorial: A Short Course on the Basics. Addison-Wesley Professional, 2018.

Website:

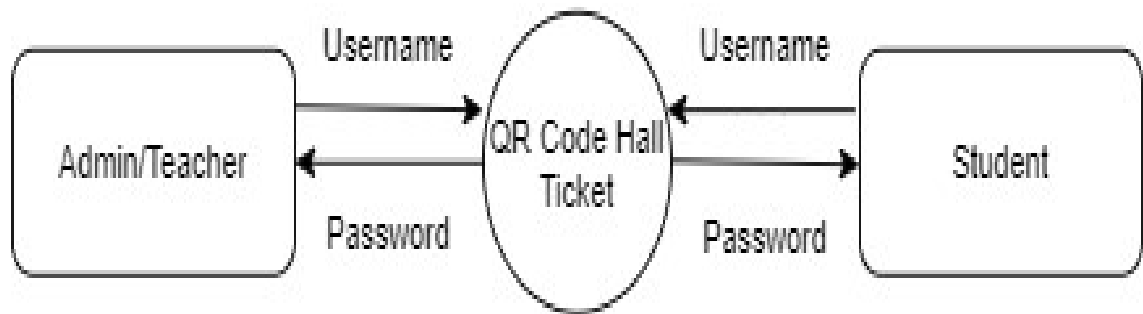
- Baeldung. "Java Tutorials and Articles." Baeldung, 2023, <https://www.baeldung.com/java-tutorials>.
- GeeksforGeeks. "Java Programming Language." GeeksforGeeks, 2023, <https://www.geeksforgeeks.org/java/>.
- Stack Overflow. "Questions tagged [java]." Stack Overflow, <https://stackoverflow.com/questions/tagged/java>.
- Tutorials Point. "Java Tutorial." Tutorials Point, 2023, <https://www.tutorialspoint.com/java/index.htm>.
- Vogella. "Java Tutorials." Vogella, 2023, <https://www.vogella.com/tutorials/java.html>.
- GitHub. "Java Repositories." GitHub, <https://github.com/topics/java>.

APPENDICES

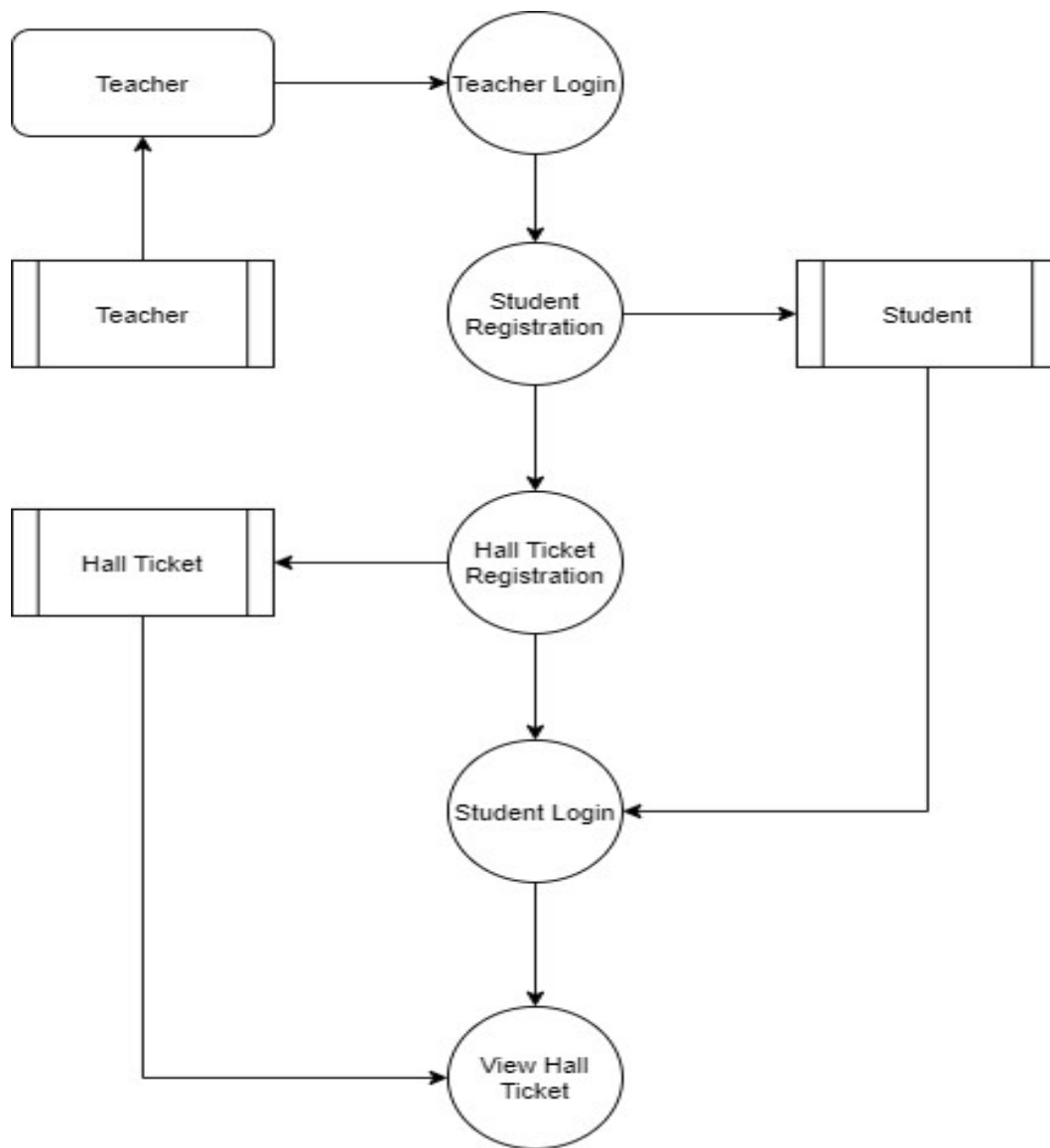
A. DATA FLOW DIAGRAM

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or system. The DFD also provides information about the outputs and inputs of each entity and process itself. A data-flow diagram is a part of structured-analysis modeling tools.

LEVEL 0:



LEVEL 1:



B. TABLE STRUCTURE

The table needed for each module was designed and the specification of each and every column was given based on the records and details collected during record specification of the system study.

TABLE NAME: TEACHER

FIELD	DATA TYPE	SIZE	CONSTRAINT
Teacher id	INT	10	Primary key
Username	Varchar	20	Not null
Password	Varchar	20	Not null

TABLE NAME: HALL TICKET

FIELD	DATA TYPE	SIZE	CONSTRAINT
Hall Ticket id	Int	10	Primary key
Student Id	Int	10	Foreign Key
Hall No	Varchar	10	Not null
Exam Date	Date	10	Not null

TABLE NAME: STUDENT

FIELD	DATA TYPE	SIZE	CONSTRAINT
Student id	Int	10	Primary key
Firstname	Varchar	20	Not null
Lastname	Varchar	5	Not null
Roll No	Int	10	Not null
Department	Int	20	Not null
Class name	Varchar	20	Not null
Username	Int	15	Not null
Password	Varchar	7	Not null

C. SAMPLE CODEING

```
package com.example.demo.configuration;
import java.util.Properties;
import javax.sql.DataSource;
import org.springframework.beans.factory.annotation.Value;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.jdbc.datasource.DriverManagerDataSource;
import org.springframework.orm.hibernate5.HibernateTransactionManager;
import org.springframework.orm.hibernate5.LocalSessionFactoryBean;
import org.springframework.transaction.annotation.EnableTransactionManagement;

@Configuration
@EnableTransactionManagement
public class HibernateConfiguration {
    @Value("${db.driver}")
    private String DB_DRIVER;
    @Value("${db.password}")
    private String DB_PASSWORD;
    @Value("${db.url}")
    private String DB_URL;
    @Value("${db.username}")
    private String DB_USERNAME;
    @Value("${hibernate.dialect}")
    private String HIBERNATE_DIALECT;
    @Value("${hibernate.show_sql}")
    private String HIBERNATE_SHOW_SQL;
    // @Value("${hibernate.hbm2ddl.auto}")
    private String HIBERNATE_HBM2DDL_AUTO;
    @Value("${entitymanager.packagesToScan}")
    private String ENTITYMANAGER_PACKAGES_TO_SCAN;

    @Bean
    public LocalSessionFactoryBean sessionFactory() {
        LocalSessionFactoryBean sessionFactory = new LocalSessionFactoryBean();
        sessionFactory.setDataSource(dataSource());
        sessionFactory.setPackagesToScan(ENTITYMANAGER_PACKAGES_TO_SCAN);
        Properties hibernateProperties = new Properties();
```

```

hibernateProperties.put("hibernate.dialect", HIBERNATE_DIALECT);
hibernateProperties.put("hibernate.show_sql", HIBERNATE_SHOW_SQL);
//    hibernateProperties.put("hibernate.hbm2ddl.auto", HIBERNATE_HBM2DDL_AUTO);
sessionFactory.setHibernateProperties(hibernateProperties);
return sessionFactory;
}

@Bean
public DataSource dataSource() {
    DriverManagerDataSource dataSource = new DriverManagerDataSource();
    dataSource.setDriverClassName(DB_DRIVER);
    dataSource.setUrl(DB_URL);
    dataSource.setUsername(DB_USERNAME);
    dataSource.setPassword(DB_PASSWORD);
    return dataSource;
}

@Bean
public HibernateTransactionManager transactionManager() {
    HibernateTransactionManager txManager = new HibernateTransactionManager();
    txManager.setSessionFactory(sessionFactory().getObject());
    return txManager;
}

}

package com.example.demo.configuration;
import org.springframework.context.annotation.Configuration;
import org.springframework.web.servlet.config.annotation.CorsRegistry;
import org.springframework.web.servlet.config.annotation.EnableWebMvc;
import org.springframework.web.servlet.config.annotation.WebMvcConfigurerAdapter;

@Configuration
@EnableWebMvc
public class WebConfig extends WebMvcConfigurerAdapter {

    @Override
    public void addCorsMappings(CorsRegistry registry) {
        registry.addMapping("/*");
    }
}

package com.example.demo.controller;
import java.util.List;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.GetMapping;

```

```

import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;
import com.example.demo.dao.ApiDao;
import com.example.demo.response.GetCitizenResponse;
import com.example.demo.response.GetComplaintResponse;
import com.example.demo.service.ApiService;

@RestController
@RequestMapping(value = { "/api" })
public class ApiController {

    @Autowired
    ApiService service;

    @Autowired
    ApiDaodao;

    @GetMapping("/login/{username}/{password}")
    public String login(@PathVariable String username, @PathVariable String password) {
        return service.login(username, password);
    }

    @GetMapping("/add_student/{firstname}/{lastname}/{rollno}/{dept}/{classname}/{username}/{password}")
    public String member_register(@PathVariable String firstname, @PathVariable String lastname,
                                   @PathVariable String rollno,
                                   @PathVariableString dept,
                                   @PathVariable String classname,
                                   @PathVariable String username,
                                   @PathVariable String password) {
        dao.studentRegister(firstname, lastname, rollno, dept, classname, username, password);
        return "Student Saved Successfully";
    }

    @GetMapping("/add_hallticket/{rollno}/{subjectname}/{hallno}/{date}")
    public String add_hallticket(@PathVariable String rollno, @PathVariable String subjectname,
                                 @PathVariable String hallno,
                                 @PathVariableString date) {
        dao.add_hallticket(rollno, subjectname, rollno, hallno, date);
        return "Hall Ticket Generated Successfully";
    }

    @GetMapping("/get_tickets")
    public List<Object[]> get_tickets() {

```

```

        returndao.get_tickets();
    }
    @GetMapping("/get_ticket/{id}")
    public List<Object[]>get_tickets(@PathVariable Integer id) {
        returndao.get_tickets(id);
    }
}

package com.example.demo.dao;
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.List;
import javax.transaction.Transactional;
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.query.NativeQuery;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Repository;

@Repository
@Transactional
public class ApiDao {
    @Autowired
    SessionFactory sf;

    public String login(String username, String password) {
        // TODO Auto-generated method stub
        Session session = sf.getCurrentSession();
        String sql = "select * from admin where username='"+username+"' and
password='"+password+"'";
        NativeQuery nq = session.createNativeQuery(sql);
        if (nq.list().size() != 0) {
            return "admin";
        } else {
            String sql1 = "select * from student where username='"+username+"' and
password='"+password+"'";
            NativeQuery nq1 = session.createNativeQuery(sql1);
            if (nq1.list().size() != 0) {
                List<Object[]> a = nq1.list();
                return "id="+a.get(0)[0];
            } else {
                return "Invalid";
            }
        }
    }
}

```

```

        }
    }
}

public void studentRegister(String firstname, String lastname, String rollno, String dept,
String classname,
    String username, String password) {
    // TODO Auto-generated method stub
    Session session = sf.getCurrentSession();
    String sql = "INSERT INTO `student` (`id`, `fname`, `lname`, `rollno`, `department`,
`classname`, `username`, `password`) VALUES "
        + "(NULL, '"+firstname+"', '"+lastname+"', '"+rollno+"', '"+dept+"',
        '"+classname+"', '"+username+"', '"+password+"');";
    System.out.print("test"+sql);
    session.createSQLQuery(sql).executeUpdate();
}

public void add_hallticket(String rollno, String subjectname, String rollno2, String hallno,
String date) {
    // TODO Auto-generated method stub
    Session session = sf.getCurrentSession();
    String sql = "INSERT INTO `hallticket` (`id`, `rollno`, `subject`, `hallno`, `exdate`)
VALUES"
        + " (NULL, '"+rollno+"', '"+subjectname+"', '"+hallno+"',
        '"+date+"');";
    session.createSQLQuery(sql).executeUpdate();
}

public List<Object[]>get_tickets() {
    Session session = sf.getCurrentSession();
    String sql = "select h.rollno,s.fname,s.lname,h.id as hallticket,h.subject from hallticket h left
join student s ON(s.rollno=h.rollno)";
    NativeQuery nq = session.createNativeQuery(sql);
    return nq.list();
}

public List<Object[]>get_tickets(Integer id) {
    // TODO Auto-generated method stub
    Session session = sf.getCurrentSession();
    String sql = "select h.rollno,s.fname,s.lname,h.id as hallticket,h.subject from
hallticket h left join student s ON(s.rollno=h.rollno) where s.id="+id;
    NativeQuery nq = session.createNativeQuery(sql);
    return nq.list();
}

```



```

}
package com.example.demo.controller;
import java.util.List;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.http.ResponseEntity;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.PathVariable;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.RestController;
import com.example.demo.dao.ApiDao;
import com.example.demo.response.GetCitizenResponse;
import com.example.demo.response.GetComplaintResponse;
import com.example.demo.service.ApiService;
@RestController
@RequestMapping(value = { "/api" })
public class ApiController {
    @Autowired
    ApiService service;
    @Autowired
    ApiDaodao;
    @GetMapping("/login/{username}/{password}")
    public String login(@PathVariable String username, @PathVariable String password) {
        return service.login(username, password);
    }
    @GetMapping("/add_student/{firstname}/{lastname}/{rollno}/{dept}/{classname}/{username}/{password}")
    public String member_register(@PathVariable String firstname, @PathVariable String lastname,
        @PathVariable String rollno,
        @PathVariable String dept,
        @PathVariable String classname,
        @PathVariable String username,
        @PathVariable String password) {
        dao.studentRegister(firstname, lastname, rollno, dept, classname, username, password);
        return "Student Saved Successfully";
    }
    @GetMapping("/add_hallticket/{rollno}/{subjectname}/{hallno}/{date}")
    public String add_hallticket(@PathVariable String rollno, @PathVariable String subjectname,
        @PathVariable String hallno,

```

```

        @PathVariableString date) {
            dao.add_hallticket(rollno,subjectname,rollno,hallno,date);
            return "Hall Ticket Generated Sucessfully";
        }
        @GetMapping("/get_tickets")
        public List<Object[]>get_tickets() {
            returndao.get_tickets();
        }
        @GetMapping("/get_ticket/{id}")
        public List<Object[]>get_tickets(@PathVariable Integer id) {
            returndao.get_tickets(id);
        }
    }
}

package com.example.demo.configuration;
import java.util.Properties;
import javax.sql.DataSource;
import org.springframework.beans.factory.annotation.Value;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;
import org.springframework.jdbc.datasource.DriverManagerDataSource;
import org.springframework.orm.hibernate5.HibernateTransactionManager;
import org.springframework.orm.hibernate5.LocalSessionFactoryBean;
import org.springframework.transaction.annotation.EnableTransactionManagement;

@Configuration
@EnableTransactionManagement
public class HibernateConfiguration {
    @Value("${db.driver}")
    private String DB_DRIVER;
    @Value("${db.password}")
    private String DB_PASSWORD;
    @Value("${db.url}")
    private String DB_URL;
    @Value("${db.username}")
    private String DB_USERNAME;
    @Value("${hibernate.dialect}")
    private String HIBERNATE_DIALECT;
    @Value("${hibernate.show_sql}")
    private String HIBERNATE_SHOW_SQL;
    // @Value("${hibernate.hbm2ddl.auto}")
    private String HIBERNATE_HBM2DDL_AUTO;

```

```

@Value("${entitymanager.packagesToScan}")
private String ENTITYMANAGER_PACKAGES_TO_SCAN;

@Bean
public LocalSessionFactoryBean sessionFactory() {
    LocalSessionFactoryBean sessionFactory = new LocalSessionFactoryBean();
    sessionFactory.setDataSource(dataSource());
    sessionFactory.setPackagesToScan(ENTITYMANAGER_PACKAGES_TO_SCAN);
    Properties hibernateProperties = new Properties();
    hibernateProperties.put("hibernate.dialect", HIBERNATE_DIALECT);
    hibernateProperties.put("hibernate.show_sql", HIBERNATE_SHOW_SQL);
    // hibernateProperties.put("hibernate.hbm2ddl.auto", HIBERNATE_HBM2DDL_AUTO);
    sessionFactory.setHibernateProperties(hibernateProperties);
    return sessionFactory;
}

@Bean
public DataSource dataSource() {
    DriverManagerDataSource dataSource = new DriverManagerDataSource();
    dataSource.setDriverClassName(DB_DRIVER);
    dataSource.setUrl(DB_URL);
    dataSource.setUsername(DB_USERNAME);
    dataSource.setPassword(DB_PASSWORD);
    return dataSource;
}

@Bean
public HibernateTransactionManager transactionManager() {
    HibernateTransactionManager txManager = new HibernateTransactionManager();
    txManager.setSessionFactory(sessionFactory().getObject());
    return txManager;
}

}

package com.example.demo.dao;
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.List;
import javax.transaction.Transactional;
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.query.NativeQuery;
import org.springframework.beans.factory.annotation.Autowired;

```

```

import org.springframework.stereotype.Repository;

@Repository
@Transactional
public class ApiDao {

    @Autowired
    SessionFactory sf;

    public String login(String username, String password) {
        // TODO Auto-generated method stub
        Session session = sf.getCurrentSession();
        String sql = "select * from admin where username='"+username+"' and
password='"+password+"'";
        NativeQuery nq = session.createNativeQuery(sql);
        if (nq.list().size() != 0) {
            return "admin";
        } else {
            String sql1 = "select * from student where username='"+username+"' and
password='"+password+"'";
            NativeQuery nq1 = session.createNativeQuery(sql1);
            if (nq1.list().size() != 0) {
                List<Object[]> a = nq1.list();
                return "id="+a.get(0)[0];
            } else {
                return "Invalid";
            }
        }
    }

    public void studentRegister(String firstname, String lastname, String rollno, String dept,
String classname,
        String username, String password) {
        // TODO Auto-generated method stub
        Session session = sf.getCurrentSession();
        String sql = "INSERT INTO `student` (`id`, `fname`, `lname`, `rollno`, `department`,
`classname`, `username`, `password`) VALUES "
            + "(NULL, '"+firstname+"', '"+lastname+"', '"+rollno+"', '"+dept+"',
 '"+classname+"', '"+username+"', '"+password+"')";
        System.out.print("test"+sql);
        session.createSQLQuery(sql).executeUpdate();
    }

    public void add_hallticket(String rollno, String subjectname, String rollno2, String hallno,
String date) {

```

```

        // TODO Auto-generated method stub
        Session session = sf.getCurrentSession();
        String sql = "INSERT INTO `hallticket` (`id`, `rollno`, `subject`, `hallno`, `exdate`)
VALUES"
        + " (NULL, '"+rollno+"', '"+subjectname+"', '"+hallno+",
        '"+date+"');";
        session.createSQLQuery(sql).executeUpdate();
    }
    public List<Object[]>get_tickets() {
        Session session = sf.getCurrentSession();
        String sql = "select h.rollno,s.fname,s.lname,h.id as hallticket,h.subject from hallticket h left
join student s ON(s.rollno=h.rollno)";
        NativeQuery nq = session.createNativeQuery(sql);
        return nq.list();
    }
    public List<Object[]>get_tickets(Integer id) {
        // TODO Auto-generated method stub
        Session session = sf.getCurrentSession();
        String sql = "select h.rollno,s.fname,s.lname,h.id as hallticket,h.subject from
hallticket h left join student s ON(s.rollno=h.rollno) where s.id="+id;
        NativeQuery nq = session.createNativeQuery(sql);
        return nq.list();
    }
}

```

D. SAMPLE INPUT & OUTPUT DESIGN

ADMIN LOGIN

QR CODE HALL TICKET

STUDENT REGISTRATION

[STUDENT REGISTRATION](#) [HALL TICKET REGISTRATION](#) [VIEW HALL TICKETS](#) [Logout](#)

FIRST NAME

divya

LAST NAME

s

ROLL NO

2022k0125

DEPARTMENT

computer science

CLASS NAME

b.sc

USERNAME

divya

PASSWORD

2023

Register Student

HALL TICKETS

[STUDENT REGISTRATION](#) [HALL TICKET REGISTRATION](#) [VIEW HALL TICKETS](#) [Logout](#)

ROLL NO

2022k0171

SUBJECT NAME

java

EXAM HALL NO




56

EXAM DATE

04-03-2023

Create Member

QR CODE GENERATION

STUDENT REGISTRATION HALL TICKET REGISTRATION <u>VIEW HALL TICKETS</u> Logout				
#	Roll No	Student Name	Hall Ticket Number	QR Code
1	2022k0125	divya	3	
2	2022k0125	divya	3	
3	2022k0126	kavi	4	

STUDENT LOGIN

QR CODE HALL TICKET

Username

Password

LOGIN

VIEW HALL TICKET

STUDENT REGISTRATION HALL TICKET REGISTRATION <u>VIEW HALL TICKETS</u> Logout				
#	Roll No	Student Name	Hall Ticket Number	QR Code
1	2022k0125	divya	3	
2	2022k0125	divya	3	