



COLLEGE OF APPLIED BUSINESS & TECHNOLOGY

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Report of partial fulfillment of CSC 366: E-Governance on

“Result Distribution System: Result-e”

PRACTICAL EXAM-2081

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DECLARATION

I, Biraj Pudasaini, hereby declare that the project work entitled "Result-e: Result Distribution System" is a record of original work done by me under the guidance of Mr. Tekendra Nath Yogi. This project work has not been used to get any Degree, Diploma, Associate-ship, Fellowship, or any other similar titles. The work presented here is my own effort, and I have carried it out with honesty and dedication. All sources of information have been properly acknowledged.

SUPERVISOR RECOMMENDATION

With this certification, I verify that the project work titled "Result-e" is a true account of the work that Biraj Pudasaini completed under my direction and guidance. The project exhibits a great degree of technical proficiency, creativity, and dedication. Biraj Pudasaini has created and executed a comprehensive digital solution that effectively tackles the inefficiencies present in Tribhuvan University's current result distribution procedure. This work demonstrates the technical proficiency and problem-solving abilities of Biraj by demonstrating the application of theoretical knowledge to real-world situations.

Supervisor:

Mr. Tekendra Nath Yogi

Lecturer, E-Governance

Tribhuvan University

ACKNOWLEDGEMENT

This project has been a valuable learning experience. I worked diligently to gather information and develop the Result-e. Numerous individuals have contributed to the successful completion of this project, and we are deeply appreciative of everyone's generous support.

I want to sincerely thank all those who have been recognized and the countless others who have helped in various ways. Your participation and assistance in this project have been invaluable.

I express my deepest gratitude to our faculty, Mr. Tekendra Nath Yogi, for his well-directed guidance and constant support throughout the project. His expertise and encouragement were crucial to our success. We are also equally grateful to the “College of Applied Business And Technology” for providing us this opportunity to gain new experiences and expand our knowledge.

Thank you all for your contributions and support.

Biraj Pudasaini (26044)

ABSTRACT

The Result-e is a project aimed at revolutionizing the way results are published and distributed within the university. The goal of Result-e: Result Distribution System project is to completely transform the way results are disseminated and published on campus. Through the use of modern technologies like Go, MySQL, and GORM, this system offers students a digital platform that guarantees real-time access to results. It improves the entire student experience by addressing the inefficiencies in the manual result distribution procedure, which frequently causes delays and inaccuracies.

For administrators, Result-e offers a robust toolset for managing student data, courses, semesters, and marks. The system allows for seamless CRUD (Create, Read, Update, Delete) operations, ensuring that data management is both efficient and secure. Administrators can easily add, edit, delete, and update information related to students, batches, programs, semesters, marks, and courses. The system also includes mechanisms to ensure that results are only published when all necessary marks are entered, promoting accuracy and completeness.

The primary objective of Result-e is to make the result distribution process digital, effective, and fast. By providing a user-friendly interface, the system makes it easy for students to view their results as soon as they are published. Additionally, the system is designed to be scalable, allowing for future enhancements such as detailed mark sheets for all semesters, re-examination management, and updated results for students who retake exams. Overall, Result-e aims to bring significant improvements to the result distribution system at Tribhuvan University, making it more efficient and responsive to the needs of students and administrators alike.

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LIST OF ABBREVIATIONS

TU: Tribhuvan University

ER: Entity-Relationship

CRUD: Create, Read, Update, Delete

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CHAPTER 1: INTRODUCTION

1.1 Introduction:

The Result-e is a Result Distribution System which is designed to modernize and streamline the process of result publication and distribution. This system addresses the limitations of the current manual process by offering real-time access to results for students and a comprehensive management tool for administrators. By digitizing the result distribution process, the system aims to improve efficiency, reduce errors, and provide a more user-friendly experience.

The Result-e system automates these processes, including the secure entry of marks, result calculation, and publication. For administrators, it simplifies data management and ensures results are published only when all necessary information is complete. This innovative approach aims to enhance the overall effectiveness and speed of result distribution at Tribhuvan University.

1.2 Problem Statement

The current result distribution process at Tribhuvan University is manual and inefficient, leading to delays and errors. Students often receive their results and mark sheets months after the results are published, which hampers their academic progress and creates unnecessary stress. Additionally, the manual handling of data increases the risk of inaccuracies and mismanagement, further complicating the process. This outdated system highlights the urgent need for a more efficient and reliable digital solution to improve both the timeliness and accuracy of result distribution [1].

1.3 Objectives of the study

The primary objective of this project is to develop a digital Result Distribution System that enhances the overall result management process at Tribhuvan University. This system aims to provide:

- **Real-time Access to Results:** Students will be able to view their academic results immediately after they are published, eliminating delays and allowing for timely academic planning and decision-making.
- **Efficient Management:** Administrators will benefit from a streamlined tool for managing student data, courses, and results. The system will support automated

updates and data management, reducing administrative workload and minimizing errors.

- **Secure and User-friendly Interfaces:** Both students and administrators will interact with secure, intuitive interfaces designed to ensure ease of use and protect sensitive information. The system will implement robust authentication and authorization mechanisms to safeguard data and provide a seamless user experience.
- **Automated Result Calculation:** The system will automatically calculate results based on entered marks, ensuring accuracy and consistency. This automation will reduce the risk of human error and speed up the result publication process.
- **Batch-wise Result Publication:** Results can be published batch-wise, allowing for organized and systematic dissemination of information. This feature will enable administrators to manage large volumes of data efficiently.

1.4 Scope

This project's scope consists of:

- creation of an easy-to-use web application to distribute results.
- CRUD operations for students, batches, programs, semesters, grades, and courses are implemented.
- To safeguard sensitive data, use secure permission and authentication procedures.
- Students' viewing and posting of results in real time.
- automated validation and computation of results to guarantee accuracy.
- Results are managed both programmatically and batch-wise for structured data processing

1.5 Development Methodology

For the development of the Result-e system, the Waterfall model can be a suitable choice. The Waterfall model is a linear sequential approach that progresses through defined phases in a strict order, where each phase is completed before moving on to the next. This model is appropriate for Result-e because the requirements are well-defined and unlikely to change significantly during the development process [2].

Here are the reasons to choose the Waterfall model for Result-e:

- **Structured Approach:** Follows a clear, sequential process that ensures each step is

completed before moving on to the next.

- **Clear Documentation:** Produces detailed documentation at each stage, ensuring that all aspects of the project are thoroughly recorded and easily understood.
- **Well-Defined Stages:** Each phase has specific deliverables and review processes, making it easy to track progress and ensure that all requirements are met.
- **Easier Management:** The linear nature of the Waterfall model makes it straightforward to manage, allowing for better planning, monitoring, and control throughout the development process.

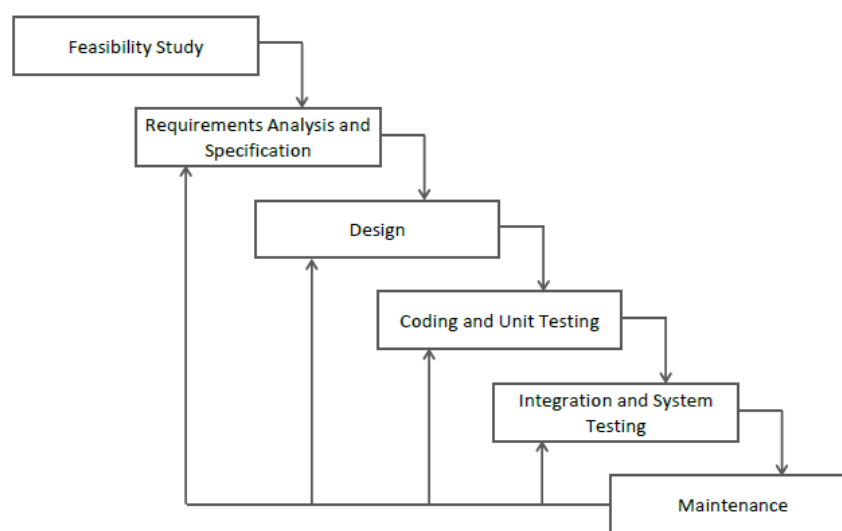


Figure 1: Waterfall Model

1.6 Organization of the Report

This report is organized into the following sections:

- **Background and Literature Review:** Provides an overview of existing research and systems related to result distribution.
- **Requirement Analysis:** Details the functional and non-functional requirements, including use case diagrams and system specifications.
- **Design:** Describes the system architecture, including ER diagrams, DFDs, class diagrams, and sequence diagrams.
- **Implementation:** Outlines the development process, tools used, major code modules, and test cases.
- **Conclusion:** Summarizes the project outcomes and key findings.

- **Future Enhancement:** Suggests potential improvements and additional features for the system.
- **References:** Lists the sources and literature referenced in the report.
- **Appendix:** Includes supplementary materials such as code, data, and screenshots of the project.

CHAPTER 2: BACKGROUND AND LITERATURE REVIEW

The current result distribution system at Tribhuvan University is largely manual, involving paper-based processes that are both time-consuming and prone to errors. This traditional method not only delays the availability of results but also increases the workload for administrative staff. Students often face long wait times to receive their mark sheets, which can hinder their academic planning and progress. This inefficiency is compounded by the potential for human errors in data entry and result calculation, further complicating the process and leading to inaccuracies that can significantly impact students' academic records.

Literature on digital result distribution systems highlights numerous benefits, including increased efficiency, accuracy, and accessibility. Studies have shown that adopting digital systems can streamline the entire process, from data entry to result publication, thereby reducing administrative burden and minimizing errors. Various universities worldwide, such as Harvard, Stanford, and the University of Melbourne, have successfully implemented digital result distribution systems, resulting in faster, more reliable dissemination of results. These systems often feature real-time result access, automated calculations, and secure data management, ensuring that students receive their results promptly and accurately. By implementing a similar digital system, Tribhuvan University can modernize its result distribution process, offering a more efficient, accurate, and user-friendly experience for both students and administrators.

CHAPTER 3: REQUIREMENT ANALYSIS

3.1 System Analysis:

System Analysis is the process of studying and understanding a system to identify its requirements and problems, and to define its functionality. It involves:

1. **Requirement Analysis:** Gathering and defining the needs of users and stakeholders.
2. **Functional Requirements:** Specifying what the system should do, including key functionalities and processes.
3. **Use Case Diagrams:** Visual representations of system interactions between users and the system, illustrating user roles and system functions.
4. **System Design:** Creating a blueprint of how the system will be structured and how components will interact to meet the requirements.

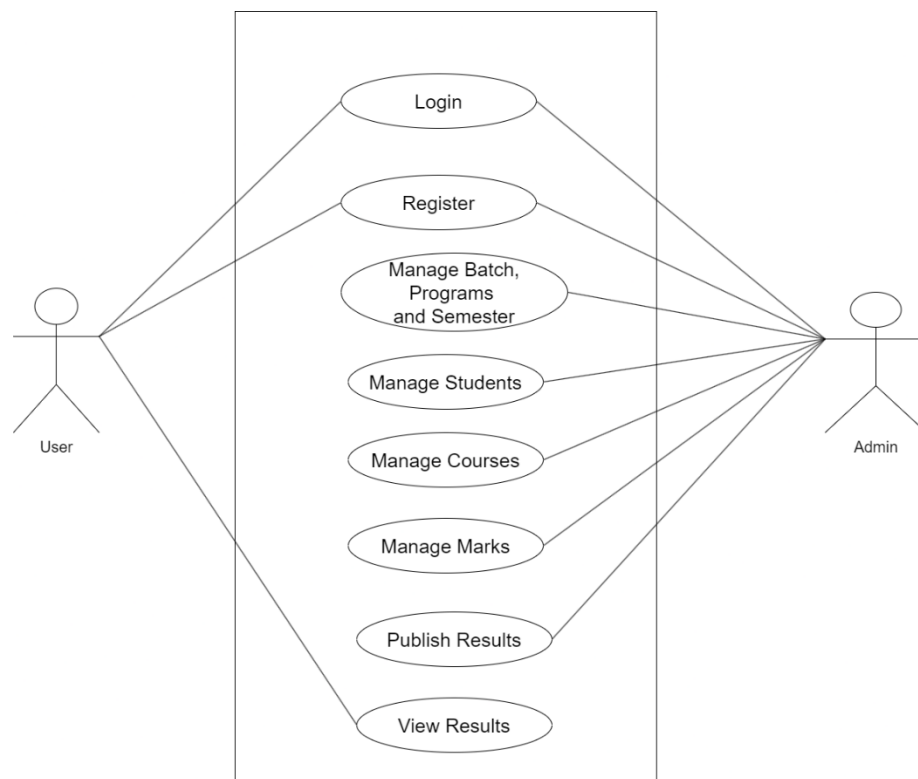


Figure 2: Use Case Diagram

3.1.1 Requirement Analysis

i. Functional Requirements

To make the website functional, we require the following:

- **User Registration and Authentication:** Users must be able to create accounts, log in securely, and manage their profiles.
- **Profile Management:** Users should update their personal information, view transaction history, and manage document requests.
- **Application Processing:** Automate workflows for submitting applications, approvals, and document issuance.
- **Data Validation and Verification:** Integrate with national databases for accurate and authentic data verification.
- **Administrative Dashboards:** Enable government staff to monitor application processes, generate reports, and handle disputes.

ii. Non-Functional Requirements

Non-functional requirements define the quality attributes and constraints that the system must adhere to, ensuring overall effectiveness and user satisfaction. For the e-commerce website project that sells bikes, these include:

- **Security:** Implement advanced encryption, secure authentication, and access control measures to protect sensitive data.
- **Scalability:** Ensure the system can handle a growing number of users and records without performance degradation.
- **Usability:** Design user-friendly interfaces for both citizens and administrative staff.
- **Reliability:** Ensure the system is highly available with minimal downtime.
- **Interoperability:** Ensure seamless integration with other governmental systems for data sharing and collaboration.

Chapter 4: SYSTEM DESIGN

System Design is a phase in the software development lifecycle focused on defining the architecture and structure of a system. It involves creating detailed plans for how the system's components will interact to meet the specified requirements.

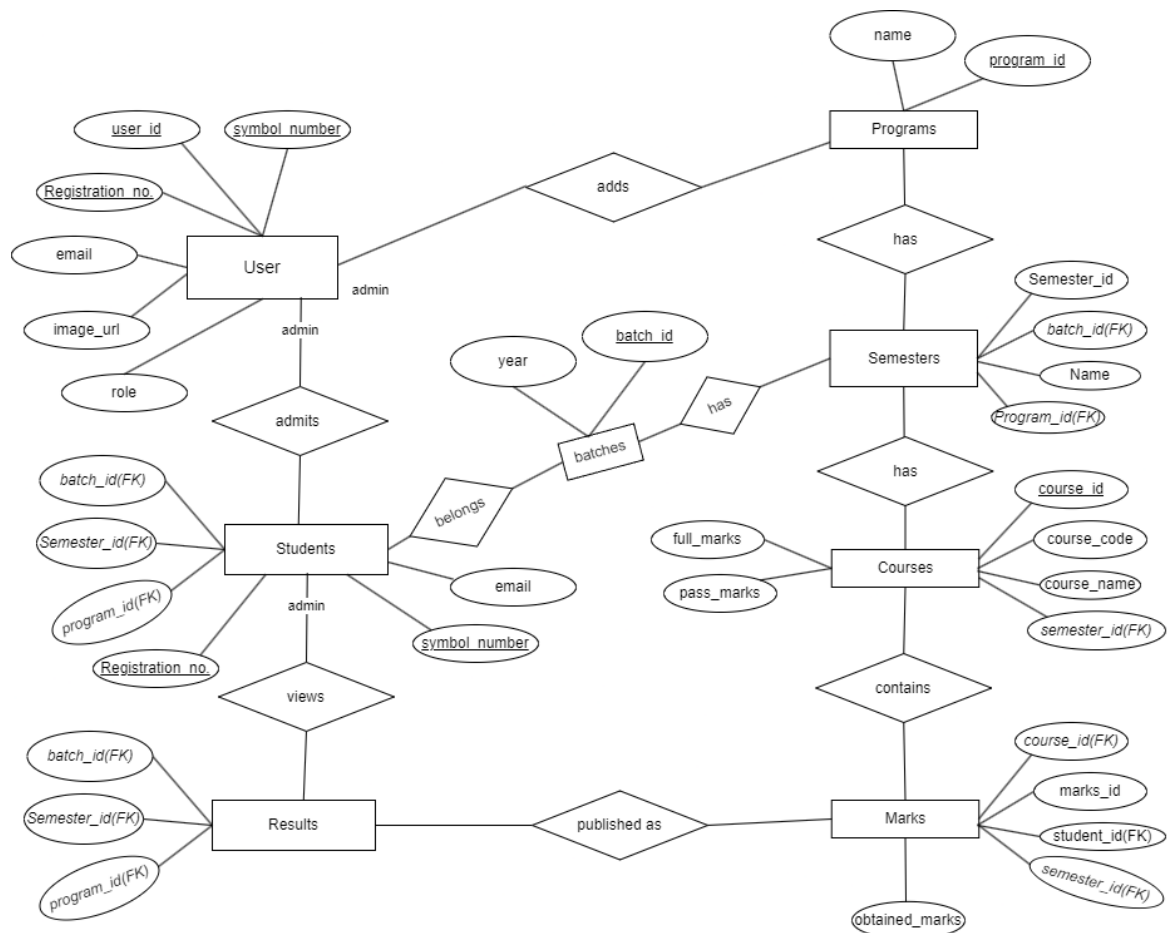


Figure 3: ER Diagram of Result-e

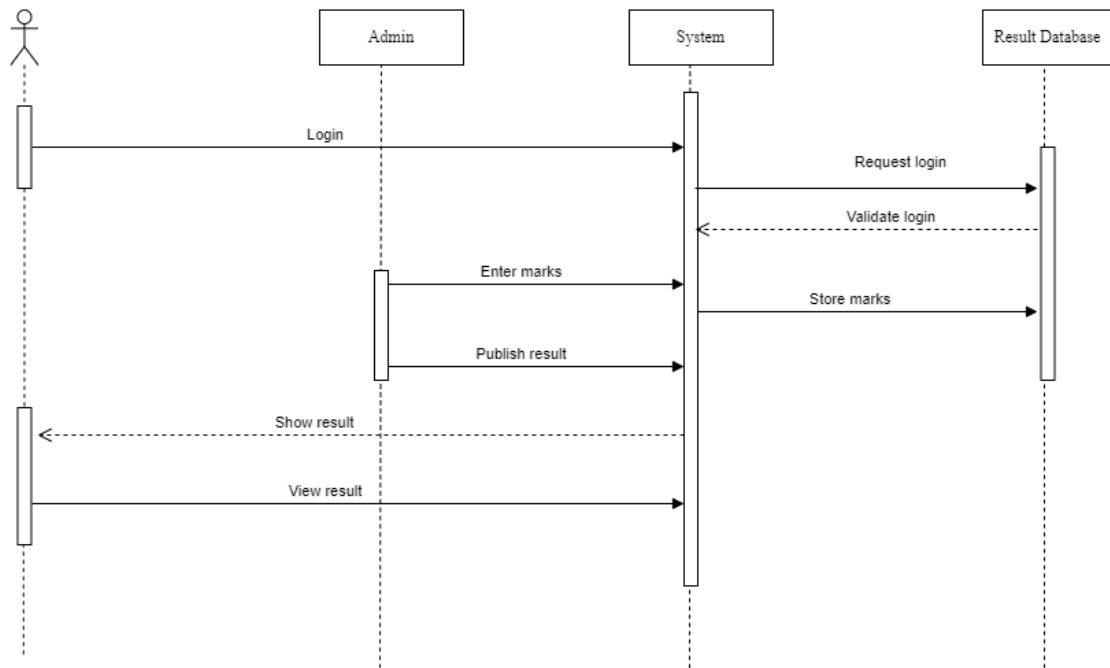


Figure 4: Sequence Diagram

Chapter 5: IMPLEMENTATION AND TESTING

5.1. Implementation

5.1.1 Tools Used:

A web application project requires a range of tools and technologies to be used to create functional and user-friendly websites. Here is a list of tools and technologies that were used to create this project:

- **Backend-Golang:** The Result-e system is developed using the Go programming language, known for its performance, efficiency, and ease of use.
- **Frontend-HTML, CSS, JS:** Go is a popular backend scripting language which integrates well with HTML and CSS.
- **Database-MySQL:** MySQL is used as the database management system to store and manage all the data related to students, courses, semesters, and results.
- **ORM-GORM:** GORM is utilized as the Object-Relational Mapping (ORM) library to interact with the MySQL database in a more efficient and structured manner.
- **Framework-Fiber:** Fiber is the web framework chosen for its simplicity, speed, and compatibility with Go, facilitating the development of the web-based application for Result-e.
- **Documentation:** Microsoft Word and Google Docs were used to document this project.
- **Visual Prototyping Tool:** Draw.io and Visual Studio were used as visual prototyping tools. This can be used to create mockups and prototypes of web applications. These tools make it easy to visualize and test the user interface of a web application before it is built.

5.2 Testing

5.2.1 Unit Testing:

Unit Testing focuses on testing individual components or units of the software in isolation. The goal is to verify that each unit of the software performs as expected.

Table 1: Test Case for Verifying the Login credentials.

TC_ID	Test Case Description	Expected Output	Actual Output	Remarks
TC_01	Verify if user is able to login with invalid credentials.	An error message should be displayed.	An error message is be displayed	Pass
TC_02	Verify if user can login with valid credentials.	The student should see the successful login and should be redirected towards the homepage.	User can login	Pass

Table 2: Test Case for Verifying Students/Users Registration form.

TC_ID	Test Case Description	Expected Output	Actual Output	Remarks
TC_01	Register a new student by entering symbol number, email address, password	User created and redirected to homepage.	User created and redirected to homepage.	Pass
TC_02	Enter an already used Email address/Symbol Number.	An error message: "The email or Symbol Number has already been taken."	Users receive the error message.	Pass

TC_03	Enter incorrect format for Email Address/Symbol Number for Email	An error message: "Invalid email / Symbol Number entered by user"	User should receive the pop up message as invalid email/Symbol Number	Pass
TC_04	Enter a different password for the password.	An error message: The password is short and weak.	Users receive the error message.	Pass

Table 3: Test Case for Marks Assigning form

TC_ID	Test Case Description	Expected Output	Actual Output	Remarks
TC_01	Enter invalid Course ID.	An Invalid Course ID	An error is shown	Pass
TC_02	Enter valid Course ID	Users redirect to the add marks form to enter the obtained marks	Users redirect to the marks assigning form table with information from the Students List.	Pass
TC_03	User tries to edit the preloaded marks.	Users should not be able to edit preloaded marks.	Users are not able to edit preloaded marks.	Pass

5.2.2 System Testing:

System Testing focuses on testing the complete and integrated software system to verify that it meets the specified requirements. This involves testing the entire application, including interactions between different components and external systems [3].

Table 4: Test Case for Result Publication

TC_ID	Test Case Description	Expected Output	Actual Output	Remarks
TC_01	User fills the publishing result.	The information should be stored in the central DB and result is issued which can be viewed in the “Student Profile” along with marks.	The information should be stored in the central DB and result is issued which can be viewed in the “Student Profile” along with marks	Pass

5.3 Major Code Modules [4]

```
package main
```

```
import (
```

```
    "log"
```

```
    "os"
```

```
    "github.com/gofiber/fiber/v2"
```

```
    "github.com/gofiber/fiber/v2/middleware/session"
```

```
    "github.com/gofiber/template/html/v2"
```

```
    "github.com/mysterybee07/result-distribution-system/initializers"
```

```
    "github.com/mysterybee07/result-distribution-system/middleware"
```

```
    "github.com/mysterybee07/result-distribution-system/routes"
```

```

func init() {

    initializers.Connect()

    initializers.LoadEnvironment()

}

func main() {

    port := os.Getenv("PORT")

    if port == "" {

        log.Fatal("The port is taken by another process.")

        port = "8080"

    }

    log.Println("Starting the server on port " + port + ".....")

    // Load templates

    engine := html.New("./resources/views", ".html")

    engine.AddFunc("add", func(values ...int) int {

        sum := 0

        for _, v := range values {

            sum += v

        }

        return sum

    })

    app := fiber.New(fiber.Config{

        Views: engine,

```



```
})
```

```
// Initialize session store
```

```
store := session.New()
```

```
// Use session middleware
```

```
app.Use(func(c *fiber.Ctx) error {
```

```
    sess, err := store.Get(c)
```

```
    if err != nil {
```

```
        return err
```

```
    }
```

```
    c.Locals("session", sess)
```

```
    return c.Next()
```

```
})
```

```
// Use flash messages middleware
```

```
app.Use(middleware.FlashMessages)
```

```
// Loading static files
```

```
app.Static("/", "./static")
```

```
// Loading images
```

```
app.Static("/static", "./static")
```

```
// Authentication routes
```

```
routes.Home(app)
```

```
// Routes
```

```
routes.Profile(app)
```

```
routes.Dashboard(app)

routes.Student(app)

routes.Batch(app)

routes.Program(app)

routes.Semester(app)

routes.Subject(app)

routes.Mark(app)

routes.Result(app)

routes.Error(app)

err := app.Listen(":" + port)

if err != nil {

    log.Fatalf("Server failed to listen: %v", err)

}

log.Println("Server exited")

}
```

Chapter 6: CONCLUSION AND FUTURE RECOMMENDATION

6.1 Conclusion

The Result-e, developed using Go, MySQL, and GORM, effectively addresses the significant shortcomings of the existing manual result distribution process. This project introduces a robust digital platform that provides real-time access to student results and an efficient management tool for administrators. The system ensures that students receive their results promptly, eliminating delays and reducing errors associated with manual handling. It also enhances the transparency and accessibility of academic records, which is crucial for both students and administrative staff. The successful implementation of this project demonstrates its potential to bring about a significant improvement in the academic administration of Tribhuvan University.

The Result-e system's user-friendly interface and secure authentication mechanisms make it an essential tool for modernizing the university's result distribution process. It not only meets the immediate needs of the stakeholders but also lays a foundation for future enhancements and scalability. The project has shown that digital transformation in educational institutions is not just feasible but also highly beneficial.

6.2 Future Recommendation

While the current implementation of the Result Distribution System has made considerable progress, there are several areas where future enhancements can further improve its functionality and user experience:

1. **Implementing Edit and Update Operations for Courses and Marks:** Extend the system's capabilities to allow administrators to edit and update course information and student marks. This will enable corrections and updates to be made efficiently, ensuring the accuracy of student records.
2. **Allowing Students to Access Mark Sheets for All Semesters:** Enhance the system to provide students with access to their mark sheets for all semesters, not just the most recently published results. This will offer students a comprehensive view of their academic performance over time.
3. **Storing and Updating Results for Students Who Fail and Need Re-examinations:** Introduce a module to handle re-examination processes. This will

include storing the results of students who fail, managing their re-examination schedules, and updating their records upon successful completion of re-examinations.

4. **Automated Notifications and Alerts:** Implement automated notifications to alert students and administrators about result publications, upcoming exams, and re-examination schedules. This will ensure that all stakeholders are kept informed in a timely manner.
5. **Integration with Other University Systems:** Explore the possibility of integrating the Result-e system with other university systems such as the student information system (SIS) and the learning management system (LMS) to provide a seamless experience for users.
6. **Enhanced Security Features:** Continuously improve the security features of the system to protect sensitive student data. This includes implementing advanced encryption methods, regular security audits, and user authentication improvements.

By addressing these future enhancements, the Result Distribution System can become an even more powerful and comprehensive tool for managing academic results at Tribhuvan University. The ongoing development and refinement of the system will contribute to a more efficient, transparent, and user-friendly educational environment.

Appendix

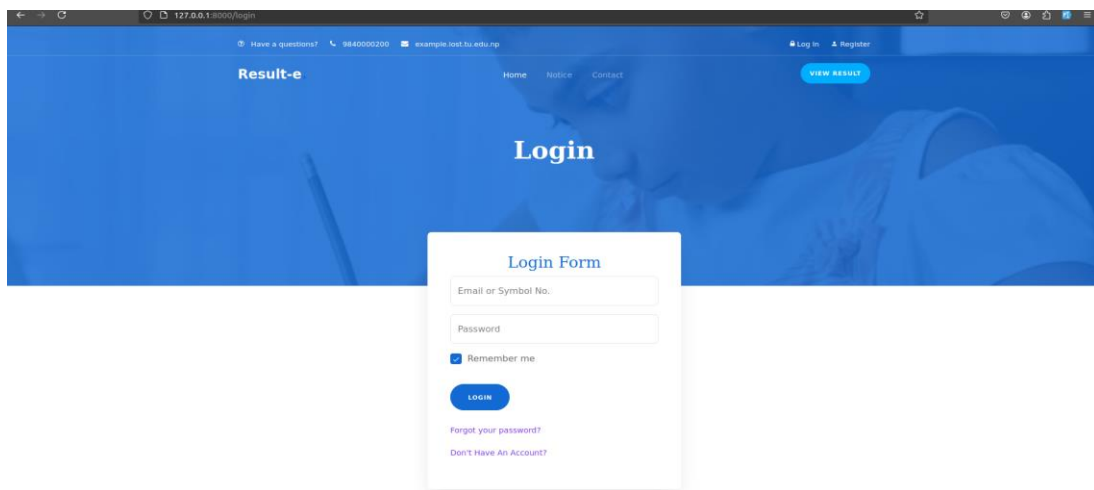


Figure 5: Login page

Add Student Data

Symbol Number	Registration	Fullname
A12345	B12345	Abc Xyz
C56789	D56789	Def Ghj

Add Student

Submit

Figure 6: Add Student Section

Enter Marks

Symbol Number	Semester Marks	Assistant Marks	Practical Marks
S12345	<input type="text"/>	<input type="text"/>	<input type="text"/>
S98765	<input type="text"/>	<input type="text"/>	<input type="text"/>

PreviousSubmit

Figure 7: Marks adding page

Result-e

Search for projects

Home

Students

Marks

Batch

Programs

Semester

Courses

Results

Notices

Add Admin

Add Batch

Select Batch

Select year

Submit Batch

Added Batch

S.NO.	NAME
1	2024
2	2023

Figure 8: Admin Dashboard page

```
...verybad7@system:~$
$ ls -la
total 4
-rw-r--r-- 1 user user 4096 Nov 11 12:11 .
```

Prayash Dhungel
S98765
2th Semester

Result Status pass

Email test@example.com

[Edit](#) [Forgot Password](#)

Semester: First

SNo.	Course Code	Subject	Full Marks				Pass Marks				Marks Obtained			
			Asst	Sem	Prac	Total	Asst	Sem	Prac	Total	Asst	Sem	Prac	Total
1	CSC 108	IIT	20	60	20	100	8	24	8	40	20	56	20	96
2	CSC 109	DSA	20	60	20	100	8	24	8	40	16	54	18	88
Grand Total:			200								184			

Figure 9: Student Profile Page

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- [1] "Examination Controller Division," [Online]. Available: <https://www.fomecd.edu.np/>. [Accessed 26 May 2024].
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