

# **Result Pro**

## **University Results Management System**

by

**[Group 11]**

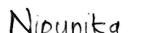
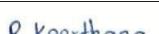
*Submitted in partial fulfilment of the requirement for the degree  
of Bachelor of Science in Information Technology*

Department of Physical Science  
Faculty of Applied Science  
University of Vavuniya

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# Declaration

We Group [11] declare that this Project Report is original and has not been published and/or submitted for any other degree award to any other University before. The project is publicly available in the following GitHub repository <https://github.com/punya2001-pk/ResultPro.git>, and it will not be removed.

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# **Approval**

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# Chapter 1

## Introduction

### 1.1 Background

Currently, the university follows a semi-digital process for publishing student examination results, where all results are released collectively in a single PDF document. Although this method is simple to implement, it introduces several limitations. Students are required to manually search through lengthy PDF files to locate their individual results, which is time-consuming and inefficient. In addition, this approach compromises student privacy as the academic performance of all students is visible to others.

Furthermore, calculations of the Grade Point Average (GPA) and the Cumulative Grade Point Average (CGPA) often need to be performed manually, increasing the likelihood of human error. The semi-digital nature of the process also restricts accessibility, automation, and effective data management.

To address these issues, this project introduces an academic prototype named ResultPro, a University Results Management System. The proposed system provides a secure digital platform where students can log in and access only their personal results. It automates GPA and CGPA calculations to ensure accuracy and reduces administrative workload. The system also enables administrators to manage courses, modules, and student results within a structured database environment. Compared to the existing PDF-based approach, the proposed solution offers improved privacy, efficiency, accessibility, and reliability in result publication.

## **1.2 Problem Statement**

The current result publication method used by the university is semi-digital, where examination results are distributed collectively through a single PDF document. This approach creates several challenges. First, it lacks privacy, as all students' results are visible to others. Second, navigating through large PDF files to locate individual results is inconvenient and inefficient for students.

Moreover, the existing process does not provide automated GPA or CGPA calculations, which increases the possibility of human error and reduces accuracy. From an administrative perspective, managing results using manual or semi-digital methods makes data validation, verification, and error tracking difficult. The absence of a centralized and secure digital system limits scalability, transparency, and timely result publication.

Therefore, there is a need for a secure, centralized, and fully digital result management system that ensures privacy, accuracy, and efficiency in managing university examination results. Such a system should allow students to access only their individual results, automate GPA and CGPA calculations, and provide administrators with structured tools to manage academic records effectively.

## **1.3 Main Objective**

The main objective of this project is to design and develop a centralized, secure, and efficient University Results Management System that replaces the existing semi-digital PDF-based result publication method. The system aims to provide students with personalized and private access to their examination results while enabling administrators to manage academic records in a structured and reliable digital environment.

### **1.3.1 Specific Objectives**

The specific objectives of the study were:

- To analyze the limitations of the existing semi-digital result publication system used by the university.
- To conduct a preliminary study on the current method of publishing examination results through common PDF documents.

- To design a secure, web-based result management system that provides personalized access for students and effective management tools for administrators.
- To implement system features such as secure user authentication, result entry and management, and automated GPA/CGPA calculation.
- To test the developed system to ensure accuracy, security, usability, and reliability.

## 1.4 Scope of the study

This project is limited to developing a mechanism that supports the secure and efficient management of university examination results. The scope of the study includes both student and administrator functionalities, such as secure authentication, result entry, verification, publication, and automated GPA and CGPA calculation. The system primarily focuses on replacing the existing PDF-based result publication method with a personalized and secure digital platform.

However, the study does not cover other academic management functions such as attendance tracking, timetable scheduling, fee management, or transcript generation. The system is developed as an academic prototype and does not directly interact with real university databases or official examination records.

## 1.5 Significance of the study

The significance of this study lies in its contribution to improving the efficiency, accuracy, and privacy of university examination result management. The proposed system, ResultPro, addresses the limitations of the existing semi-digital result publication method by introducing a secure and personalized web-based platform.

This study is significant to students, as it provides a private and convenient way to access individual examination results, automatically calculated GPA and CGPA values, and downloadable or printable result sheets. It eliminates the need to search through lengthy PDF documents and reduces the risk of privacy violations.

From an administrative perspective, the system simplifies result entry, verification, and publication processes while minimizing manual errors. Au-

tomated calculations and structured data management improve reliability and transparency in academic record keeping.

Academically, this project serves as a practical prototype demonstrating the application of modern web technologies to solve real-world university-level problems. The study also establishes a scalable foundation that can be extended in the future to support additional academic management functionalities such as transcript generation and advanced reporting.

# Chapter 2

# Requirement Analysis

## 2.1 Introduction

This chapter contains a detailed description of the system requirements identified for the proposed **ResultPro – University Result Management System**. Requirement analysis is a critical phase of system development, as it helps to clearly understand what the system is expected to do and the constraints under which it must operate.

The requirements were gathered by analyzing the existing semi-digital result publication process used by the university and identifying its limitations, such as lack of privacy, manual GPA/CGPA calculation, and inefficient result access. Based on this analysis, the functional and non-functional requirements of the proposed system were defined.

This chapter outlines the expectations of both administrators and students, ensuring that the system meets user needs, maintains data security, and delivers accurate and reliable results. The identified requirements serve as the foundation for system design, implementation, and testing in subsequent chapters.

## 2.2 Requirements Gathering

The requirements for the proposed **ResultPro – University Result Management System** were collected using multiple systematic methods to ensure accuracy, relevance, and completeness. These methods were selected to clearly understand the needs of both students and administrative users, as well as the limitations of the existing system.

- **Observation:** The existing result publication process was closely observed, particularly the use of common PDF documents for publishing

examination results. This helped to identify issues such as lack of privacy, difficulty in searching results, and inefficiencies in result access.

- **Document Analysis:** Existing result sheets, grading formats, GPA/CGPA calculation methods, and academic records were reviewed to understand the current structure of result management and academic workflows.
- **User Discussions:** Informal discussions were conducted with students and academic staff to gather user expectations, challenges faced in the current system, and desired features for the new system.
- **Literature Review:** Related research articles, academic project reports, and existing university result management systems were studied to identify best practices and common system features.
- **System Analysis:** Analysis of similar digital result management platforms was carried out to understand standard functionalities, security mechanisms, and workflow structures.

These methods collectively ensured that the gathered requirements were realistic, user-centered, and aligned with academic and institutional standards. The collected requirements form the foundation for defining the functional and non-functional requirements of the proposed system.

## 2.3 Requirements Specification

This section summarizes the functional and non-functional requirements of the proposed **ResultPro – University Result Management System**. These requirements define what the system should do and the quality attributes it must satisfy in order to provide a secure, reliable, and user-friendly solution for managing university examination results.

### 2.3.1 Functional requirements

The functional requirements describe the core functions and services that the system must provide to its users.

- The system shall provide secure authentication for administrators and students.
- The system shall allow administrators to add, update, and manage student records.

- The system shall allow administrators to manage courses, degree programs, and modules.
- The system shall enable administrators to enter, update, and delete examination results.
- The system shall support bulk upload of results using CSV or Excel files.
- The system shall automatically calculate GPA and CGPA based on predefined grading rules.
- The system shall allow administrators to verify and approve results before publication.
- The system shall allow students to securely log in and view only their individual results.
- The system shall allow students to download or print personalized result sheets.
- The system shall maintain logs of result modifications for auditing purposes.

### **2.3.2 Nonfunctional requirements**

The non-functional requirements specify the quality attributes and constraints of the system.

- **Security:** The system shall ensure data privacy through authentication and role-based access control.
- **Reliability:** The system shall store, retrieve, and process result data accurately without data loss.
- **Usability:** The system shall provide an intuitive and user-friendly interface for both administrators and students.
- **Performance:** The system shall efficiently handle large volumes of student and result data.
- **Scalability:** The system shall be extensible to support future academic functionalities.
- **Maintainability:** The system shall be easy to update and maintain.

- **Auditability:** The system shall maintain logs for accountability and error tracking.

## 2.4 Summary

This chapter presented a comprehensive analysis of the requirements for the proposed **ResultPro – University Result Management System**. It discussed the methods used to gather requirements and identified the functional and non-functional requirements necessary for the successful development of the system.

Through requirement gathering and analysis, the limitations of the existing semi-digital result publication process were clearly identified. The summarized requirements emphasize the need for secure authentication, accurate result management, automated GPA/CGPA calculation, and improved privacy for students.

The requirements specified in this chapter serve as a foundation for the system design and implementation phases discussed in the subsequent chapters. By clearly defining system expectations and constraints, this chapter ensures that the developed system meets user needs, maintains data security, and delivers reliable academic result management.

# Chapter 3

## System Design

### 3.1 Introduction

The project cycle as shown in the Figure 3.1



Figure 3.1: Project Cycle

## 3.2 Methodology

The development of the **ResultPro – University Result Management System** follows the Agile software development methodology. Agile was selected because it supports incremental development, flexibility, and continuous feedback, which are essential for developing an academic prototype with evolving requirements.

The methodology divides the development process into iterative phases, allowing system components to be designed, implemented, and tested in small, manageable increments. This approach enables early identification of issues and provides opportunities for improvements based on user and supervisor feedback.

The Agile process applied in this project consists of the following stages:

- **Requirement Analysis:** Identification and analysis of system requirements based on observations, discussions, and review of existing systems.
- **System Design:** Designing the overall system architecture, database structure, and user interfaces based on the identified requirements.
- **Implementation:** Developing system modules such as authentication, result management, GPA/CGPA calculation, and reporting using selected tools and technologies.
- **Testing:** Conducting unit testing and integration testing to verify the correctness, security, and reliability of system functions.
- **Review and Refinement:** Evaluating the developed features and refining the system based on feedback and testing results.

The Agile methodology is suitable for this project as it allows continuous evaluation of system functionality and ensures that the final prototype meets user requirements while maintaining quality, security, and efficiency.

### 3.3 Usecase Diagram

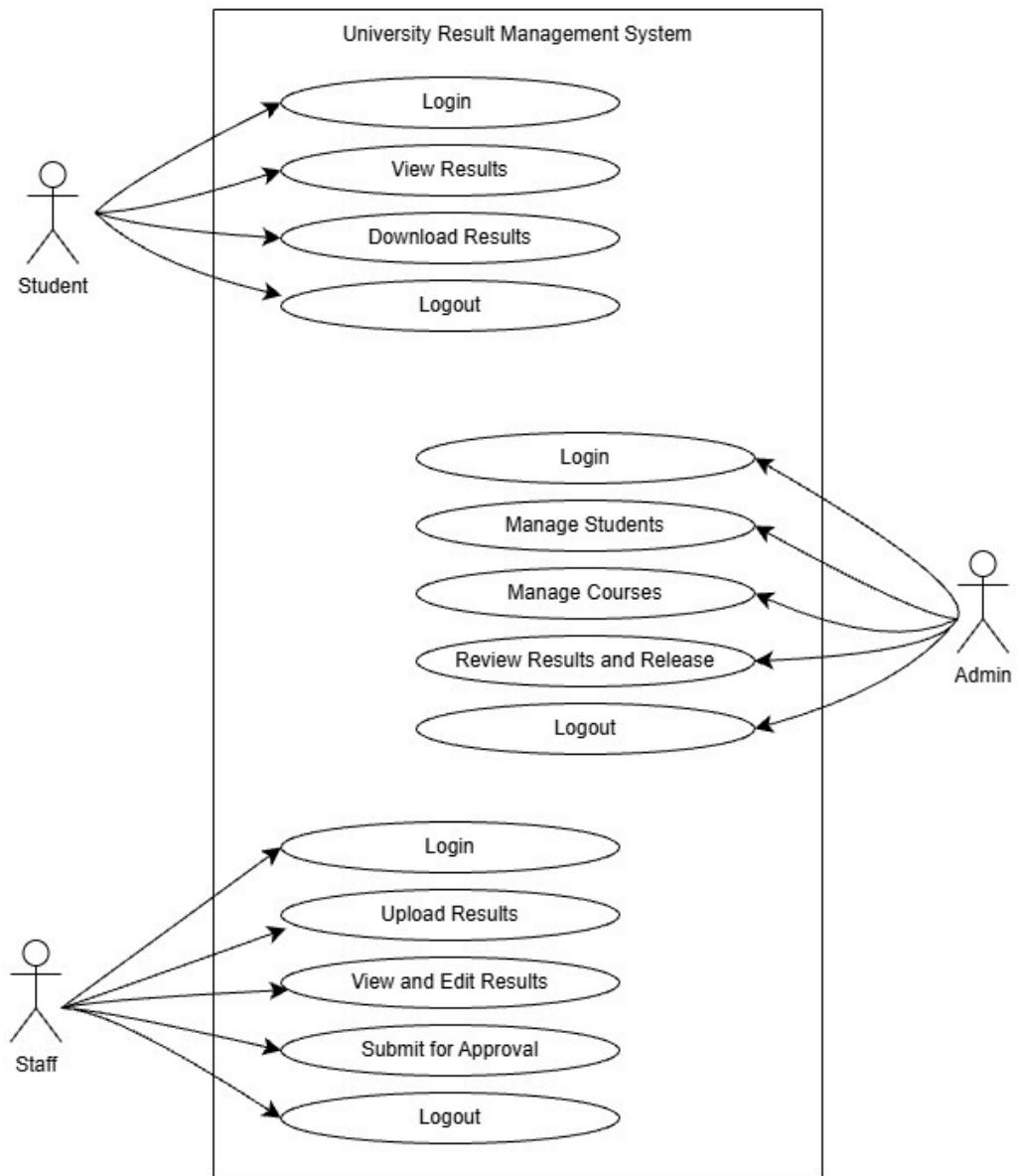


Figure 3.2: Usecase Diagram of the ResultPro System

## 3.4 Database Design

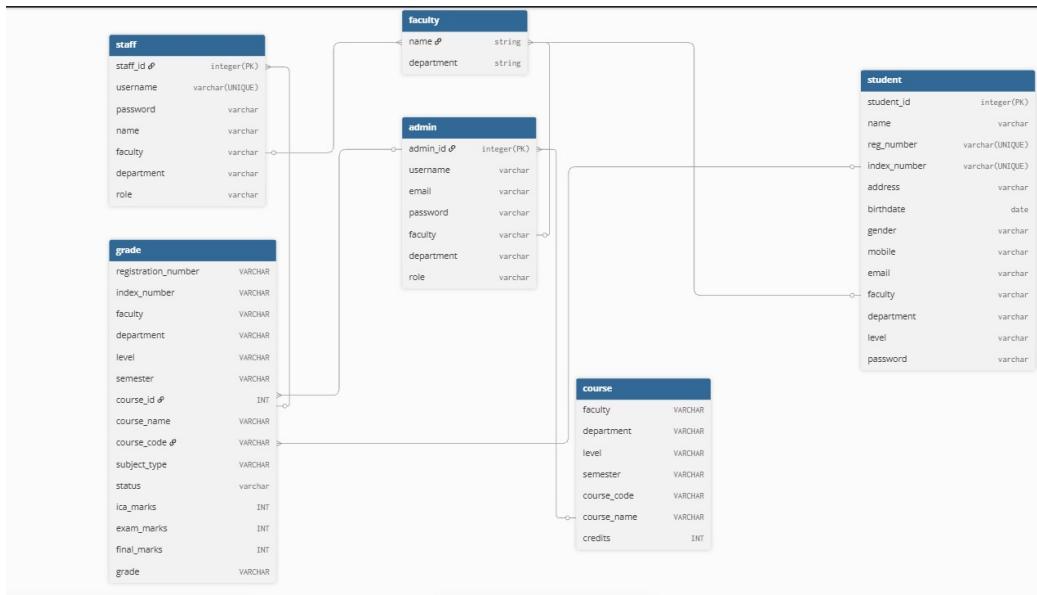


Figure 3.3: ER Diagram of the ResultPro System

## 3.5 Summary

This chapter presented the system design for the **ResultPro – University Result Management System**. It began with an overview of the project cycle, illustrating the iterative approach adopted for the development process.

The methodology section described the use of the Agile software development approach, which allowed incremental development, flexibility, and continuous feedback from users and supervisors. The key stages of the Agile process were highlighted, including requirement analysis, system design, implementation, testing, and review/refinement. This approach ensured that the system components could be designed, implemented, and tested in small, manageable increments, allowing early identification of issues and timely improvements.

Additionally, the chapter introduced the planned system models, including use case diagrams and database design (ER/EER), which provide a blueprint for implementing the system.

In summary, this chapter established a clear and structured foundation for the development of the system, ensuring that the design aligns with

user requirements, supports reliable and secure functionality, and provides a roadmap for subsequent implementation and testing phases.

# Chapter 4

## Implementation and Outcome

### 4.1 Introduction

This chapter presents the implementation of the **ResultPro – University Result Management System**. It provides detailed screenshots of system interfaces and explains the modules developed. The chapter demonstrates how the design and methodology were translated into a working application.

### 4.2 System Implementation

The system was implemented using modern web technologies to ensure modularity, security, and ease of use. Key modules include authentication, dashboards, student management, course management, result management, approval, reporting, and database management.

#### 4.2.1 Front Page

The front page provides general access and navigation to login or information pages.

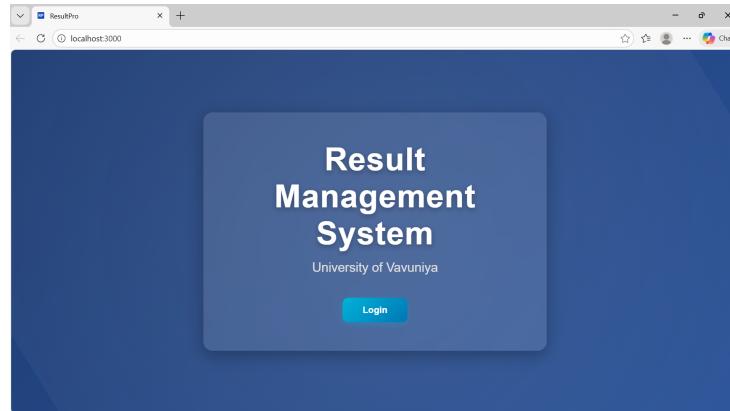


Figure 4.1: Front Page: Initial landing page for the system

#### 4.2.2 Authentication Module

The authentication module provides secure login for both administrators and students using role-based access control.

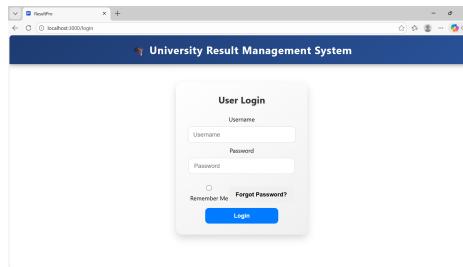


Figure 4.2: Login Page: Secure authentication for all users

#### 4.2.3 Dashboards

The system provides separate dashboards for administrators, staff, and students.

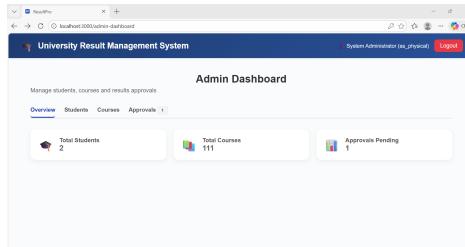


Figure 4.3: Administrator Dashboard

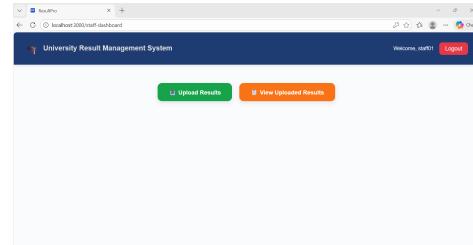


Figure 4.4: Staff Dashboard

The Student Dashboard displays the following information:

- Faculty of Applied Science: Semester CGPA: 0.87, Cumulative CGPA: 3.72
- Level: Level 1
- Courses taken: Faculty of Applied Science, Physical Science
- Course list:

CODE	COURSE NAME	CREDITS	GRADE
IT1103	Principles of Information Technology	3	AB
IT1102	Principles of Mathematics	2	C+
IT1104	Principles of Programming	4	C+
IT1106	Principles of Web Programming	4	C+
IT1102	Chemistry of Materials	2	C+
AC1103	Digital Logic I	3	C+

Figure 4.5: Student Dashboard

Figure 4.6: Dashboards: Interfaces for administrators, staff, and students

#### 4.2.4 Student Management Module

Administrators can add, edit, and view student details.

The interface allows for the following actions:

- Upload Students CSV
- Add New Student
- Search fields: Name, Registration Number, Index Number, Address, Birthdate (mm/dd/yyyy), Gender, Mobile, Email
- Table view of student details:

NAME	REG. NUMBER	INDEX NUMBER	ADDRESS	BIRTHDATE	GENDER	MOBILE	EMAIL
Punya Udayasiri	2021ict123	IT17103	Kegalle	11/12/2001	Female	0716957954	2021ict123@stu.vau.ac.lk
Kosala Madushan	2021ict36	IT17025	Balangoda	10/12/2002	Male	07744224212	2021ict36@stu.vau.ac.lk

Figure 4.7: Student Management: Adding and managing student information

## 4.2.5 Course Management Module

Administrators can manage courses, degree programs, and module details.

The screenshot shows a web browser window titled "ResultPro" with the URL "localhost:3000/courseDetails". The page is titled "Semester 1 - Course Details" and displays a table of courses for the Faculty of Applied Science, Physical Science, Level 1, Semester 1. The table has columns for COURSE CODE, COURSE NAME, CREDITS, and ACTIONS. The courses listed are:

COURSE CODE	COURSE NAME	CREDITS	ACTIONS
IT1113	Fundamentals of Information Technology	3	
IT1122	Foundation of Mathematics	2	
IT1154	Fundamentals of Programming	2	
IT1144	Fundamentals of Web Programming	2	
IT1152	Essentials of Statistics	2	
AD1113	English Language I	3	

Below the table, there is a section titled "Upload Courses via CSV" with a file input field labeled "Choose File: No file chosen" and a placeholder "Courses courseCode,courseName,credits". At the bottom, there is a form titled "Add New Course (Semester 1)" with fields for "Course Code", "Course Name", and "Credits", and a "Add Course" button.

Figure 4.8: Course Management: Adding and managing courses and programs

## 4.2.6 Result Management Module

This module allows staff and administrators to enter, edit, approve, and publish examination results.

The screenshot shows a web-based application titled 'Edit ICA Grades'. The course details are: Course Name: Fundamentals of Information Technology, Faculty: Faculty of Applied Science, Department: Physical Science, and Type: Theory (T). A message at the top says 'Successfully loaded 2 students.' Below this, there are two tables: 'Theory ICA Marks (30%)' and 'Practical ICA Marks (60%)'. Both tables have columns for Roll No., ICA 1, ICA 2, ICA 3, AICTE 1, AICTE 2, and TOTAL MARKS. The data for two students, 20114103 and 20114108, is shown. At the bottom are 'Add New' and 'Save Changes' buttons.

Figure 4.9: Edit ICA Grades (T)

This screenshot shows the same application interface as Figure 4.9, but for the Practical (P) type. The tables are labeled 'Theory ICA Marks (30%)' and 'Practical ICA Marks (60%)'. The data for the same two students is identical to Figure 4.9. The bottom buttons are also identical.

Figure 4.10: Edit ICA Grades (P)

The screenshot shows the 'University Result Management System' dashboard. A 'Upload Results' button is highlighted. Below it is a form titled 'Select Result Update Category' with 'ICA' and 'Final Exam' options.

Figure 4.11: Upload Results

This screenshot shows the 'View & Send Results' section of the system. It includes a 'Results Set' dropdown, a 'New Search' button, and a 'Send Results' button. Below these are two tables: 'ICA Marks Overview' and 'Final Exam & Drafting'. The 'ICA Marks Overview' table shows marks for students 20114103 and 20114108 across various categories. The 'Final Exam & Drafting' table shows marks for student 20114108.

Figure 4.12: View & Send Results (Admin)

Figure 4.13: Result Management: Editing ICA grades, uploading results, and managing academic performance

#### 4.2.7 Approval and Verification Module

Administrators approve results before publication to ensure accuracy.

Figure 4.14: Approval Page

Figure 4.15: Approval Section

Figure 4.16: Approval Module: Reviewing and approving results before publication

## 4.2.8 Reporting Module

Students can view and download results. Administrators can send notifications.

Figure 4.17: View Uploaded Results

Figure 4.18: Send Notifications (Admin)

Figure 4.19: Reporting Module: Viewing results, sending notifications, and generating student reports

## 4.2.9 Database Module

The database stores all student, staff, course, and result information.

Collection name	Properties	Storage size	Documents	Avg. document size	Indexes	Total Index size
admins	-	20.48 kB	6	328.00 B	3	61.44 kB
courses	-	40.96 kB	111	219.00 B	2	73.73 kB
faculties	-	4.10 kB	0	0 B	2	8.19 kB
grades	-	36.86 kB	4	608.00 B	2	73.73 kB
otps	-	4.10 kB	0	0 B	3	12.29 kB
results	-	4.10 kB	0	0 B	1	4.10 kB
staffs	-	20.48 kB	2	281.00 B	2	40.96 kB
students	-	20.48 kB	2	448.00 B	3	61.44 kB

Table 4.1: Database Table: Viewing and managing stored student, course, and result data

#### 4.2.10 GitHub Repository

All project files are available on GitHub:

<https://github.com/punya2001-pk/ResultPro.git>

The QR code links to the repository:



Figure 4.20: QR Code linking to the ResultPro GitHub repository

### 4.3 Summary

This chapter detailed the implementation of the **ResultPro** system. Screenshots for all modules are now properly captioned, ensuring they appear correctly in the \*\*List of Figures\*\*. The database table and GitHub repository are also documented for clarity.

# Chapter 5

## Conclusion

### 5.1 Introduction

This chapter presents the overall conclusion of the **ResultPro – University Result Management System** project. It summarizes the outcomes achieved through the design and development of the proposed system, highlights the major challenges encountered during the project, discusses the limitations of the current prototype, and concludes with the overall significance of the system in improving university result management.

The project aims to replace the existing semi-digital PDF-based result publication method with a secure, efficient, and student-centered digital solution.

### 5.2 Challenges

The development of the ResultPro system involved several challenges, which are outlined below:

- Understanding and accurately modeling real university result workflows, including result verification and approval processes.
- Ensuring data privacy and security so that students can access only their own results.
- Designing an automated GPA and CGPA calculation mechanism that aligns with credit-based grading systems.
- Handling bulk result uploads while maintaining data consistency and validation.

- Integrating frontend and backend components effectively using modern web technologies.
- Managing role-based access control for administrators and students.

### 5.3 Limitations

Despite its advantages, the current version of the ResultPro system has certain limitations:

- The system is developed as an academic prototype and is not directly connected to real university examination databases.
- Certain university-specific policies, such as grading rules and result publication schedules, may vary and are not fully configurable.
- Advanced features such as grade appeals, transcript generation, and notification services are not included in the current scope.
- System performance under very large-scale real-world data has not been fully tested.
- Integration with other university systems such as learning management systems is not implemented.

### 5.4 Conclusion

In conclusion, the **ResultPro – University Result Management System** successfully demonstrates a secure and efficient approach to managing and publishing examination results. The system addresses key issues in the existing semi-digital process by ensuring privacy, accuracy, and accessibility of student results.

Through features such as automated GPA/CGPA calculation, role-based access control, and personalized result access, ResultPro provides a strong foundation for a modern academic result management platform.

Although the prototype has certain limitations, it effectively showcases how digital transformation can enhance transparency and efficiency in university examination processes and can be extended further in future developments.

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