
AUTOMATED STUDENT PERFORMANCE DATA AND REPORT MANAGEMENT SYSTEM

¹Akshay Laxman Ryakawar, ²Mahi Dipak Patil, ³Avika Sunil Harne, ⁴Harshada Sanjay Avhad, ⁵*Prof. C.A. Shewale

^{1,2,3,4}Department of Information Technology Sandip Polytechnic, Nashik.

⁵Lecturer and project guide Department of Information Technology Sandip Polytechnic, Nashik.

Article Received: 31 December 2025, Article Revised: 18 January 2026, Published on: 09 February 2026

*Corresponding Author: Prof. C.A. Shewale

Lecturer and project guide Department of Information Technology Sandip Polytechnic, Nashik.

DOI: <https://doi-doi.org/101555/ijarp.2641>

ABSTRACT

NBA Criterion 4 focuses on evaluating students' performance, which includes academic results, pass percentage, student progression, placement outcomes, higher studies, internships, and achievements. In many educational institutions, this information is maintained using manual methods such as registers, spreadsheets, and scattered documents. As a result, departments often face issues like data redundancy, missing records, inaccurate reporting, and increased time and effort during accreditation preparation and internal performance evaluation. This project proposes an Automated Student Performance Data and Report Management System that provides a centralized and secure platform for storing, managing, and analyzing student performance data. The system enables authorized faculty and administrators to record student details, update academic results, maintain placement and progression information, and generate NBA Criterion 4 compliant reports. It also supports exporting reports in PDF and Excel formats, which simplifies documentation, sharing, and submission processes. Additionally, the system includes dashboards and analytical tools to monitor performance trends such as pass percentage, placement statistics, and student progression patterns. Overall, the proposed system reduces manual workload, improves accuracy, ensures transparency, and supports efficient preparation of NBA Criterion 4 documentation.

KEYWORDS: Student Performance, NBA Criterion 4, Result Analysis, Pass Percentage, Placement Records, Student Progression, Report Automation, Dashboard Analytics.

1. INTRODUCTION

Student performance is a key indicator of the academic quality and effectiveness of an educational institution. Accreditation bodies such as the National Board of Accreditation (NBA) require institutes to maintain systematic and verified documentation related to students' performance under NBA Criterion 4. This criterion includes semester-wise academic results, pass percentage, student progression, placement records, higher studies, internships, and student achievements in various academic and co-curricular activities.

In many institutions, student performance data is maintained using multiple sources such as paper files, departmental registers, and spreadsheets. During accreditation visits and internal audits, collecting and verifying this information becomes time-consuming and prone to errors. Additionally, manual processes often lead to data redundancy, missing records, and difficulties in generating standardized reports.

To overcome these challenges, this project proposes an Automated Student Performance Data and Report Management System that centralizes student performance records and supports structured data management. The system enables efficient data entry, secure storage, automated report generation, and export of reports in PDF/Excel formats. It also provides dashboards and analytics for monitoring performance trends, thereby supporting accurate decision-making and improving accreditation readiness.

2. PROBLEM DEFINITION / RESEARCH GAP

In many educational institutions, student performance data such as academic results, pass percentage, placement records, higher studies, internships, and achievements is maintained using manual registers or separate Excel sheets. This creates difficulties in collecting accurate information, verifying records, and preparing standardized reports for NBA accreditation. Manual handling also increases the chances of duplication, missing entries, and calculation errors, especially during accreditation audits and internal reviews.

Research Gap

Although several academic management systems exist, most of them do not fully support NBA Criterion 4 requirements.

The major gaps observed are:

- Lack of centralized and integrated student performance data management

- Limited automation for criterion-based report generation
- Absence of proper validation and approval workflow
- Insufficient dashboards and analytics for performance monitoring
- Difficulty in exporting NBA-ready reports in PDF/Excel formats

Therefore, a centralized automated system is required to ensure accurate record maintenance, efficient reporting, and improved accreditation readiness.

3. OBJECTIVE OF THE STUDY

The objectives of this project are:

1. To develop a centralized system for managing student performance data.
2. To store academic results, pass percentage, and performance indicators.
3. To manage placement, internship, and higher studies information.
4. To generate automated reports required for NBA Criterion 4.
5. To reduce manual effort and minimize human errors.
6. To provide dashboards and analytics for performance monitoring.
7. To improve transparency and accessibility of student performance records.

4. LITERATURE REVIEW

The proposed system is related to existing research and practical implementations in academic record management, student performance analytics, and automated report generation for accreditation processes. Several institutions use different approaches to maintain student performance records, ranging from manual documentation to fully integrated digital systems. This section summarizes the commonly used techniques and their limitations, highlighting the need for an automated and centralized solution aligned with NBA Criterion 4 requirements.

4.1 Manual and Spreadsheet-Based Performance Tracking

Many educational institutions maintain student performance data using manual registers and spreadsheet tools such as Microsoft Excel. These methods are easy to implement but often lead to issues such as inconsistent data entry, duplication of records, missing information, and difficulty in tracking student progression over multiple academic years. Additionally, preparing standardized reports for accreditation becomes time-consuming and prone to human error when data is maintained in separate files or formats.

4.2 ERP and College Management Systems

Enterprise Resource Planning (ERP) and college management systems provide integrated modules for managing student information, academic records, and administrative processes. Although these systems improve data availability and coordination, they may not be fully customized for NBA Criterion-based reporting. Furthermore, ERP solutions often involve high implementation costs, complex configuration, and regular maintenance, which can be challenging for institutions with limited resources.

4.3 Student Portals and Academic Dashboards

Student portals allow learners to access results, attendance, and academic updates online, while dashboards provide visual summaries of academic performance. These platforms improve accessibility and transparency; however, they typically focus on student-level access rather than accreditation-level reporting. In many cases, they do not provide structured data export and automated generation of criterion-specific reports required for NBA documentation.

4.4 Automated Reporting Systems

Automated reporting systems generate reports using predefined templates and structured data sources. Such systems reduce manual workload, improve consistency, and ensure faster documentation. However, many existing reporting solutions do not fully support NBA Criterion 4 requirements, especially in terms of integrated student performance tracking, validation workflows, and export-ready reports in standardized formats.

Overall, the literature indicates a strong need for a centralized system that can manage student performance records efficiently and generate accurate, NBA-compliant reports with minimal manual effort.

5. COMPARATIVE ANALYSIS

Different approaches are used for managing student performance data in educational institutions. Each approach has its own advantages and limitations in terms of accuracy, automation, scalability, and report generation. A comparison of commonly used methods is presented below.

5.1 Comparison

1. Data Management Method

- Manual systems rely on registers and paper records, which require significant effort to maintain.
- Spreadsheet-based systems store data digitally but often remain unorganized and separate across files.
- ERP systems provide integration but may be expensive and complex to implement.
- The proposed system uses a centralized database with automated workflows for efficient data handling.

2. Accuracy and Reliability

- Manual and spreadsheet methods are prone to errors, duplication, and missing entries.
- The proposed system improves accuracy through structured forms, validation, and controlled access.

3. Report Generation

- Manual report preparation is time-consuming and requires repeated formatting.
- The proposed system generates NBA Criterion 4 reports automatically and supports export in PDF/Excel formats for documentation and submission.

4. Performance Tracking

- Traditional methods do not provide a systematic way to track student progression over multiple semesters and academic years.
- The proposed system enables year-wise and semester-wise analysis for monitoring academic progress.

5. Placement and Progression Integration

- Existing methods often store placement and higher studies data separately.
- The proposed system integrates academic performance, placements, internships, and higher studies information in a single platform.

6. Security

- Manual records and spreadsheets provide limited security and access control.
- The proposed system provides secure login and role-based access control for data protection.

7. Analytics and Dashboard

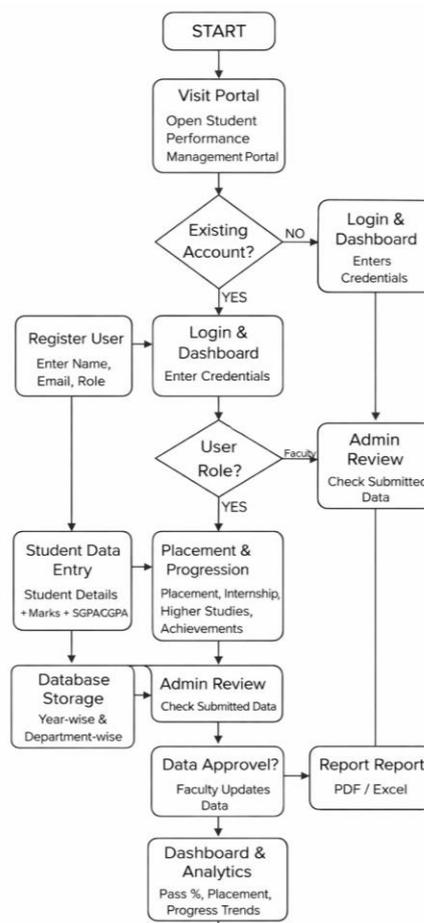
- Traditional methods do not provide visual insights or analytical summaries.
- The proposed system offers dashboards and analytics to support quick decision-making and accreditation readiness.

6. PROPOSED WORK OVERVIEW

The proposed Automated Student Performance Data and Report Management System is designed to systematically collect, store, verify, and generate reports related to NBA Criterion 4 (Students' Performance). The system provides a centralized platform that helps departments maintain accurate student performance records and produce accreditation-ready documentation with minimal manual effort.

The solution supports structured data entry, centralized database storage, administrative verification, automated report generation, and analytical dashboards. By integrating academic performance records with placement and progression details, the system ensures complete and consistent information availability for internal evaluation and NBA accreditation requirements.

6.1 System Architecture



1. Login Module

- Secure login for Admin and Faculty

- Role-based access control
- 2. Student Data Entry Module**
 - Student details (Name, Roll No, Branch, Year)
 - Academic records (semester-wise marks, SGPA/CGPA or percentage)
 - Pass/Fail status and performance indicators
- 3. Placement & Progression Module**
 - Placement details (Company, Role, Package)
 - Higher studies (GATE, MBA, MS, etc.)
 - Internship details and certifications
 - Student achievements (competitions, hackathons, awards)
- 4. Database Management**
 - Centralized database for all student performance records
 - Department-wise and year-wise data storage
- 5. Report Generation Module**
 - Automated NBA Criterion 4 report generation
 - Export reports in PDF/Excel formats
 - Year-wise and department-wise performance summary
- 6. Dashboard & Analytics**
 - Pass percentage graphs
 - Placement statistics charts
 - Student progression trend analysis
 - Quick performance summary for NBA coordinator

Workflow:

Data Entry → Database Storage → Admin Review → Report Generation → Export (PDF/Excel)

7. CONCLUSION

The Automated Student Performance Data and Report Management System provides an efficient and centralized solution for managing student performance records required under NBA Criterion 4. The system reduces manual paperwork, minimizes duplication, improves data accuracy, and saves significant time during accreditation preparation and internal evaluations.

It integrates academic results, placement details, higher studies, internships, and student achievements into a single platform, ensuring better accessibility and transparency. Additionally, dashboards and analytics enable monitoring of pass percentage, placement trends, and student progression, supporting effective decision-making. Overall, the proposed system enhances institutional productivity and strengthens accreditation readiness for diploma engineering programs.

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