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DIGITAL ACADEMIC PASSPORT: ELEVATING COLLEGE OPERATIONS

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ABSTRACT

Colleges and universities face data management challenges due to outdated systems and manual record-keeping, leading to errors and inefficiencies. The Digital Academic Passport, a cutting-edge College Management System, aims to simplify administrative processes and enable data-driven decisions. It improves data management by centralizing information in a database, reducing errors, and ensuring accuracy. This web application benefits all organizational levels. The Digital Academic Passport is a comprehensive solution for higher education institutions seeking efficient data management and improved operational effectiveness.

Index Terms: Data Security, DBMS, Web Application.

INTRODUCTION

Educational institutions have long grappled with the challenge of managing vast amounts of data related to students [1][2], faculty, courses, fees, and administrative tasks. Traditionally, this data has been stored in disparate systems, often in paper-based formats, making it cumbersome to access, update, and utilize effectively. These archaic methods result in several critical issues:

Inefficiency: Vaishali, et al[2] mentioned that manual data entry and retrieval processes are time-consuming and error-prone, diverting valuable resources away from core educational activities. Students, faculty, and administrators often struggle to access real-time information, leading to frustration and miscommunication. Educational institutions are unable to harness the full potential of their data for informed decision-making and strategic planning.

The need for a Digital Academic Passport (DAP) in educational institutions is driven by the imperative to address these challenges. DAP offers a transformative solution to modernize administrative processes, ensuring efficient data management, transparency, and security.

Simplify Complexity

A. Motivation

Our motivation for undertaking the Digital Academic Passport project stems from the desire to:

B. Simplify Complexity

We recognized the complexity of managing student and faculty data in educational institutions and sought to simplify these

C. Empower Institutions

We wanted to empower colleges and universities with a robust and user-friendly system that could enhance their administrative capabilities.

D. Promote Efficiency

Efficiency in administrative processes is crucial for the effective functioning of educational institutions. We aimed to reduce manual workloads and free up time for educators.

E. Objectives

The primary objectives of our project, Digital Academic Passport, are as follows:

Student Management
Develop a comprehensive system for storing and managing student records efficiently, including personal data, academic progress, and attendance.

B. Faculty Management
Streamline faculty management by providing tools for record-keeping, scheduling, and performance evaluations.

C. Course Management
Facilitates the planning, scheduling, and monitoring of courses, ensuring streamlined curriculum delivery.

D. Fees Management
Automate the billing and payment processes while maintaining an accurate record of fees owed and received [as suggested in [4].

E. Login Management
Implement a secure user authentication and authorization system, differentiating between students, teachers, and administrators, each with their respective permissions.

F. System User Management
Provide administrators with effective tools to manage user accounts, roles, and permissions efficiently.

The Digital Academic Passport project is an innovative response to the evolving needs of educational institutions. By leveraging modern technology and providing a comprehensive College Management System, DAP aims to empower colleges and universities to operate more efficiently, transparently, and securely [1] [4].

LITERATURE REVIEW

The "Digital Academic Passport" is a college management website designed to streamline academic record management and enhance administrative efficiency. Existing literature highlights its significance and key features:

A. Digital Academic Records
The "Digital Academic Passport" facilitates the transition from traditional paper-based records to digital academic records, offering benefits such as improved accessibility, reduced administrative burden, and heightened data accuracy.

B. Educational Technology
As a part of the broader educational technology The "Digital Academic Passport" leverages technology to enhance learning and administrative processes, aligning with the trend of personalized education and data-driven decision-making mentioned by S. Arora, et al [3].

C. MERN Stack and Full-Stack Development
The "Digital Academic Passport" harnesses the power of the MERN stack (MongoDB, Express.js, React, Node.js) by [6], to create a dynamic and scalable web application (as suggested in [8] [11].

Full-stack development plays a pivotal role in ensuring seamless user experiences and efficient management of academic data.

D. Data Presentation and Visualization
Data presentation and visualization within the "Digital Academic Passport" enable effective communication of complex academic information.

These features support informed decision-making by educators, administrators, and students, contributing to improved educational outcomes.

METHODOLOGY

Our project is designed as a web-based College Management System, comprising a client-side interface and a server-side backend. The system architecture includes components for student management, faculty management, course management, fee management, and user authentication.

A. Data Collection

Academic data is collected from users and administrators via user-friendly interfaces, with secure storage in a database for processing.

This streamlined approach ensures accurate and efficient data management in educational institutions.

B. Data Verification Process

Teachers play a crucial role in verifying academic data, and ensuring accuracy and integrity. Verified data is then updated for use by administrators and students as mentioned in [10].

C. Collaborative Functionality

Our system fosters collaboration: Students can seek guidance from faculty, faculty can communicate about course matters, and administrators have comprehensive data for informed decisions, enhancing the educational experience.

D. Technologies Used

We have utilized modern web technologies such as HTML5, CSS3, and JavaScript to develop user interfaces, ensuring cross-browser compatibility and responsive design (as suggested in [11]).

The server-side logic is built using Node.js, while Express.js is employed for routing and API development. MongoDB is the primary database system, offering scalability and flexibility [8].

To ensure data security, we have implemented the JWT technique for user authentication to check the role of the user and encryption techniques for sensitive data storage.

PROJECT DETAILS

This project consists of two major dashboards

A. Student Dashboard

1) Personal Details: This section allows students to input and update their personal information, including name, contact details, address, and other relevant particulars.
2) Academic Details: Within this section, students can access their academic records, including Semester Grade Point Average (SGPA), Cumulative Grade Point Average (CGPA), and detailed mark sheets for each semester of their undergraduate studies. This provides a comprehensive overview of their academic performance.
3) Extra-curricular Activities: Students can document and provide evidence of any extracurricular activities they engaged in during their graduation. This might include participating in clubs, sports, volunteer work, or other activities contributing to their holistic development.
4) Internship Data**:** This section allows students to record their internship experiences during their bachelor's degree. It includes information such as the company name, role, duration of the internship, and any valid offer letters or completion certificates.
5) Competitive Exams: Here, students can list the competitive exams they took during their graduation, along with their respective scores or results. This provides a snapshot of their achievements beyond coursework.
6) Technical Activities: This section highlights any technical projects or activities undertaken during their undergraduate studies. It can include coding projects, research work, or any other technical accomplishments.

7) LOR Application**:** Students can utilize this feature to request Letters of Recommendation (LORs) from their respective teachers. This streamlines the LOR application process by connecting it directly to the academic record-keeping system.

8) AMCAT Details: The AMCAT section contains the results of all student attempts in aptitude and coding tests. It helps students track their progress in these assessments.

9) Notices: This section displays notices issued by teachers, departments, or the college. It ensures that students are informed about important updates, events, or announcements relevant to their academic journey.

B. Teachers Dashboard:

1) **Personal Details:** This section allows teachers to input and update their personal information, including name, contact details, address, and other relevant particulars.

2) **Internship Data:** Teachers play a crucial role in bridging the gap between classroom learning and real-world experience by providing valuable feedback and guidance to students during their internships, helping them develop essential skills and make informed career decisions.

3) **Student Data:** This section empowers teachers with the ability to easily retrieve and analyze student data, facilitating a more tailored and effective educational experience for each individual, as well as aiding in academic planning and support.

4) **Guardian Batch:** Teachers have the ability to create batches that include students and their parents or guardians. This feature facilitates efficient communication, allowing teachers to send notices and updates to specific batches via email. This collaborative approach promotes transparency and keeps parents or guardians informed about their child's academic progress and any important updates, fostering a supportive educational environment.

5) **LORs:** Teachers can view and respond to LOR requests from students. This streamlines the LOR recommendation process, making it easier for both students and teachers to manage.

6) **Notices:** Teachers can create and distribute notices to specific departments, batches, or the entire college.

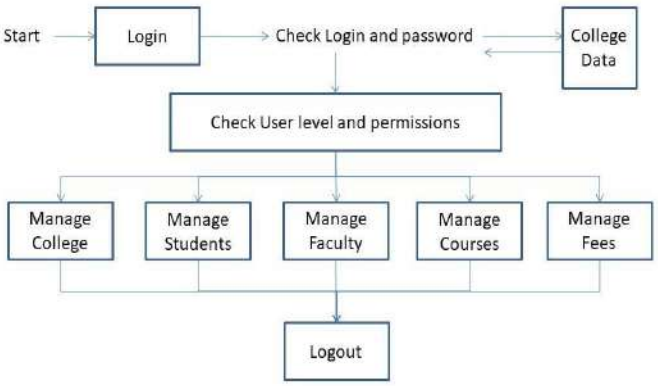

Figure 1: Block Diagram

DISCUSSION

A Digital Academic Passport (DAP) is essential in modern education, streamlining administration, providing real-time data access, and enhancing transparency. It empowers institutions, benefits stakeholders, and prioritizes data security and privacy.

Our initiative, DAP, has made important advancements in the area of educational technology. DAP improves data accessibility, encouraging openness and cooperation amongst instructors, and staff.

And administrators. The user-centric design ideas implemented into DAP prioritize usability, creating a platform that is simple to use and encourages productivity and engagement.

As the project advances, potential enhancements include integrating DAP with LMS platforms for synchronized data exchange [5], implementing AI algorithms for personalized learning, developing mobile applications for broader accessibility, exploring blockchain for enhanced data security, and adapting DAP for global use with multilingual support. Additionally, adapting DAP to accommodate multiple languages and diverse educational systems will broaden its global utility and accessibility.

Table 1: A Summary of Research Reviewed

WORK	METHODOLOGIES	KEY FINDINGS/RESULTS
Pankaj Kunekar; Ayush Gundawar; Somesh Kamnapure; Devang Manjramkar; Ishan Gujarathi; Dhananjay Deore[1]	Design and Implementation of an Advanced Semester Management Collaboration System for Academic Institutions	Implementation of an Advanced Semester Management
Vaishali Gentyal1, Ritesh patil2, Vaishnavi mudaliyar3, Gauri kanpurne4, Devyani Ambi[2]	MERN (MongoDB, Express.js, React, Node.js) stack	Development of a web application for colleges
Shakti Arora; Dinesh Chander Verma; Vijay Anant Athavale [3]	Attendance Taking Algorithm	Implementation of attendance management system security
Dr. R.M.S Parvathi1, Guru Kishore J2, Janane S3, Kaviarasu B4 [4]	Automated Fees management React JS	Implementation of the fees management system
Salomão Bento Nilo Pena; Arnaldo Manuel Pinto Santos [5]	Implementation of a Learning Management System (LMS) Systematic Literature Review	Insights into LMS implementation in Angolan higher education
P. Kanchanamala, B. H. Sai, B. Balaji, A. Panigrahi, K. Srinivas and A. V. Vardhan [6]	Automated Programming Evaluation using MERN MERN (MongoDB, Express.js, React, Node)	Programming, Software, Web development, Database, MongoDB, React.JS, Node.JS, Express.JS
S. Chickerur, A. Goudar and A. Kinnerkar [7]	Comparison of Relational Database with Document-Oriented Database MongoDb	SQL vs NoSQL, Big Data Applications
S. Palanisamy and P. SuvithaVani [8]	RDBMS and NoSQL Databases	MySQL vs NoSQL
V. Nohria, R. Maurya, S. Suraj and S. Jain [9]	Modernization of College Utilities	access services, admin panel, basic libraries, canteen, chat-bot interface, college utilities, daily processes, easy manner, long queues queues, overcrowding, payments
Piyumantha, H. P. A. H [10]	LMS systems MERN Stack	user management, course administration, material management, and library maintenance, LMS

Mahajan, Dilkash Shaikh, and Syed Rehan [11]	Structure of a live Website MERN Stack	MERN Stack, ReactJS, NodeJS, MongoDB, JWT
Shukla, S. K., Dubey, S., Rastogi, T., & Srivastava, [12]	Applications of MERN Stack Web Applications	MERN Stack Web apps E-commerce Platforms
Yojana, Ratna Mira, et al [13]	Project management system design Web App	System information management Final project system management Website based system Object-oriented modeling
S. Bhattacharya, G. S. Nainala, P. Das and A. Routray [14]	Attendance Monitoring using face recognition	Face Recognition technology, automatic attendance management system, quality monitoring, regular class attendance, academic system
.Mohammed, Khaled, A. S. Tolba, and Mohammed Elmogy [15]	Multimodal Attendance Management system for students	Student attendance management Radio Frequency Identification (RFID)Face detection and recognition Field Control (NFC)
Kumar, Kiran, Prem Chand Vashist [16]	Attendance Capturing System 2 step Authentication	2-step authentication, Android mobile application, computation time, final attendance, location-based service, provisional attendance, proxy attendances, real-time attendance capturing system
Sauphayana, S. [17]	Innovation in Education Policies. Education management and leadership	educational management, educational leadership, students, technology, higher education, COVID-19
Seo, Goeun [18]	Challenges in implementation ERP Systems	similarities and differences between corporate and university environment
Zhibing Liu; Huixia Wang; Hui Zan [19]	Student Information Management System React JS	student information management system, database maintenance, front-end application development, database design, functional module, user interface
Al-Ghofaili, Abdullah A., and Majed A. Al-Mashari [19]	ERP system adoption to education policies Cloud based Web apps	ERP systems vs. cloud-based ERP systems

RESULTS

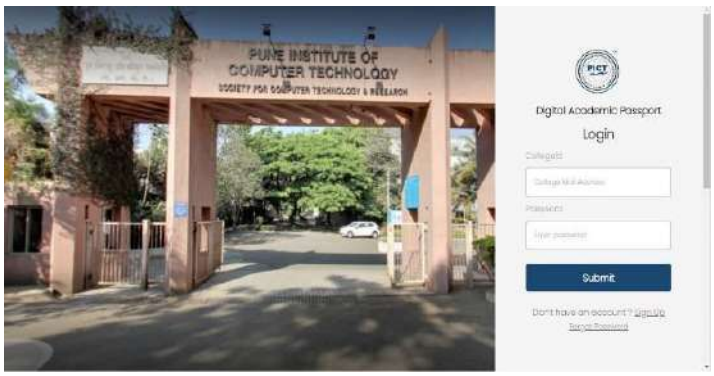

Figure 2: Login Page

Figure 3: Student Dashboard

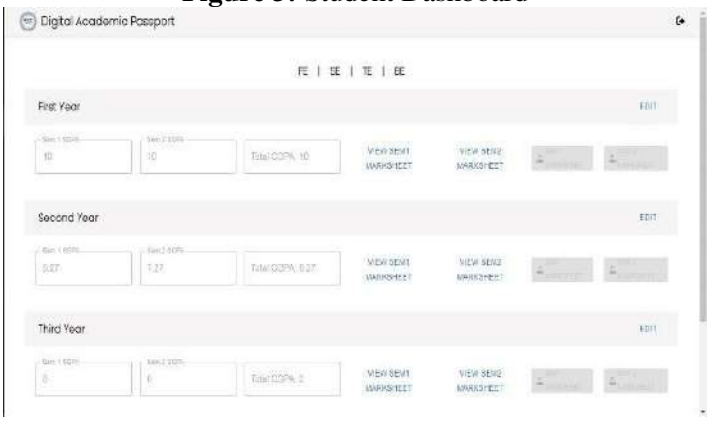

Figure 4: Academic Details

Figure 5: Internship Details

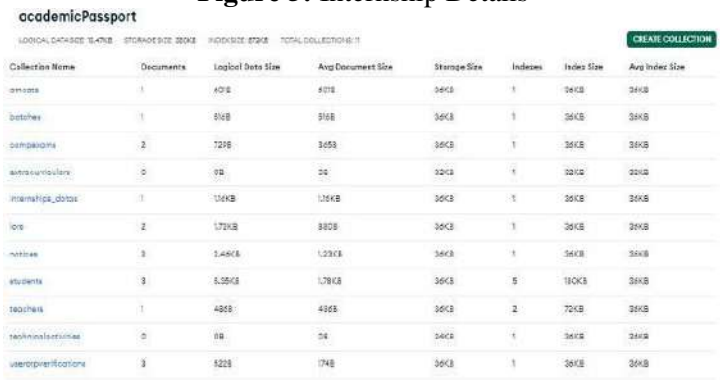

Figure 6: Database

CONCLUSION

In summary, the Digital Academic Passport (DAP) project aims to streamline academic data management in educational institutions, enhancing operational efficiency and transparency. It prioritizes data security and user-friendly design, with the potential to provide real-time data access and support informed decision-making, contributing to the modernization of educational administration. Furthermore, DAP's ongoing development and positive progress position it as a promising solution for addressing the evolving needs of educational institutions in the digital age. In summary, the Digital Academic Passport (DAP) project aims to streamline academic data management in educational institutions, enhancing operational efficiency and transparency. It prioritizes data security and user-friendly design, with the potential to provide real-time data access and support informed decision-making, contributing to the modernization of educational administration. Furthermore, DAP's ongoing development and positive progress position it as a promising solution for addressing the evolving needs of educational institutions in the digital age. DAP revolutionizes education by enhancing administration and enabling data-driven decisions, ultimately improving student outcomes and educational quality.

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[2] © June 2022 | IEEE| Volume 9 Issue 1 | ISSN: 2349-6002 IJIRT 155322 Web Application for College using MERN stack Vaishali Gentyal1 , Ritesh patil2 , Vaishnavi mudaliyar3 , Gauri kanpurne4 , Devyani ambi5 1,2,3,4,5 Pdea's college of engineering manjari bk, Pune, India

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