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An Integrated Faculty Profile Management System for Efficient Academic Data Handling

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Abstract: ***The effective maintenance of data related to the faculty is an essential requirement for modern academic institutions in relation to administrative activities, accreditation process, and performance evaluation. Existing approaches used for maintenance of faculty data are usually disintegrated, inaccurate and ineffective. This paper describes the development of the web-based Faculty Profile Management System that offers a central place for keeping, modifying and managing all academic data. The implemented functionality includes creating profiles of the staff, uploading documents and verifying them, role-based checking of the data, and generating of reports automatically. Developed on the technologies of ASP.NET Core and SQL Server, the system is implemented according to the three-tier architecture principle. Implementation results show significant improvement in accuracy and accessibility of data. Data verifications increase accuracy, and reports support managerial decision making. The proposed system greatly decreases administrative work load and makes the process of managing of academic data organized and efficient.***
Keywords: Faculty Profile System, Academic Data Management, Web Application, MIS Reporting, Role-Based Access Control

I. INTRODUCTION

In educational institutions, it is important to have effective methods of management and organization of the information regarding faculty members. Since the latter are very influential in teaching and research processes, it is important to store accurate and up-to-date information about their academic accomplishments, qualifications, project participation, and so on. Unfortunately, some institutions continue using outdated means of information organization, such as manual documentations or Excel sheets. Such practices often result in inefficiency, redundancy, or loss of data. As a consequence, decision-making becomes less efficient, and the process becomes time-consuming.

As information technologies continue developing, institutions are expected to use them to enhance their functioning. Faculty Profile Management System is designed for the storage and management of information pertaining to faculty members. In this regard, such systems may help to achieve several goals at once. They make it possible to organize and keep the information in a consistent way, facilitate its access, and ensure transparency. At the same time, these tools play an important role in accreditation and strategic decision-making. This research work is concerned with the designing and implementation of an online Faculty Profile Management System which consists of faculties' profile management, documents handling, verification process, and automated reporting. The suggested system attempts to solve the problems associated with traditional systems of faculty's profile management.

Moreover, the use of an online Faculty Profile Management System makes coordination among various departments much easier since it guarantees that all academic information is kept in a single place. It eliminates redundancy in processes performed and provides consistent representation of data by all departments of the organization. Role-based authentication increases security by allowing the performance of sensitive activities like data verification and report generation to be done only by authorized users. Besides, the online Faculty Profile Management System enables real-time updating of faculty members' profiles.

Furthermore, the inclusion of automated report generation and data analysis makes the decision-making process within institutions even better. The administrators can create detailed reports regarding the work done by the teaching staff, their productivity, and the contribution of each department to the overall institution’s performance effortlessly. This not only cuts down on time spent but also ensures that accurate information is generated in the process. The system serves as a platform that could be used for further development in the field of technology, for example, by linking up with external academic databases and using the cloud.

II. LITERATURE REVIEW

The topic of faculty profiling systems and academic information systems has become increasingly relevant in recent years due to the necessity of proper data handling. Numerous scientists examined different methodologies and technologies that could help in improving the process of data management in academic organizations.

In particular, Susilowati et al. suggested utilizing the method of profile matching in the context of allocating employee positions in the organization. Their findings prove the significance of applying systematic data evaluation, which can also be done in faculty management systems for assessing employees' performance and assigning roles accordingly [1]. Moreover, Villamor et al. designed a profiling system that helps with organizing and managing the institution's data [2]. As shown by their research, faculty profiling systems are necessary when the amount of managed data is significant and should be consistently updated.

Finally, Zare-Farashbandi et al. conducted a systematic literature review regarding the current state of faculty profiling systems in the field of academia. According to their results, such systems have proved to be effective in terms of evaluating the level of productivity, research collaboration, and overall academic performance of faculty members [3].

Additionally, Jeyapragash et al. mentioned the use of the VIDWAN database, a faculty profiling tool at the national level meant to ensure the maintenance of academic credentials and contributions [4]. The effectiveness of such centralized databases in handling large amounts of academic information can be seen through this example. In a similar manner, Thanuskodi and Kannan talked about IRINS (Indian Research Information Network System), which is an effective tool for faculty research profile management and bibliometrics [5].

One such research was carried out by Cheng, where he introduced an intelligent faculty management system which involves modular design and efficient data management system [6]. The research emphasizes the significance of scalability and flexibility of a system, allowing organizations to evolve as per their changing needs. Moreover, Bajao et al. have come up with a Web-based faculty development system focusing on professional development and training management [7]. This study has emphasized the importance of digital media in managing faculty development processes.

However, despite the emergence of new technologies in the faculty management arena, most existing systems fail to address the issue of integrated verification and reporting facilities. In fact, very little work has been done in terms of verification and automation of workflows. Data security and accessibility also constitute other issues that need immediate attention. Thus, it is crucial to introduce an integrated system which addresses the above-mentioned limitations.

The suggested Faculty Profile Management System solves these problems through its centralized, secure, and scalable approach to managing academic information. By integrating a variety of functionalities, it improves on efficiency and accuracy of data as well as ease of use. This system incorporates existing studies but offers additional benefits regarding validation processes and reports generation.

III. METHODOLOGY

The creation of the Faculty Profile Management System adheres to a methodology that is both well-planned and systematic in accordance with the Software Development Life Cycle (SDLC). It guarantees that the system can be developed and implemented efficiently. The SDLC methodology combines requirement analysis, system design, development, testing, and deployment stages, which ensure that each phase enhances the whole process of developing and implementing the system..

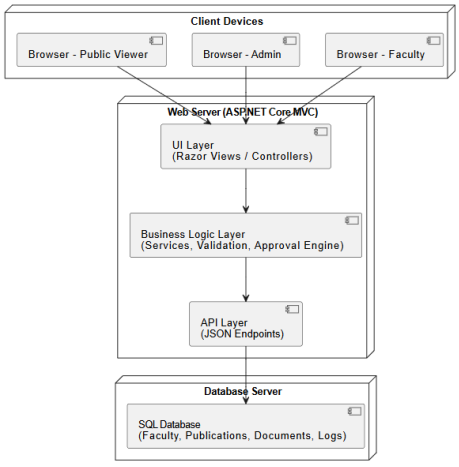

Figure 3.1:System Architecture Diagram

The requirement analysis phase includes the identification of the requirements of the stakeholders like the teachers and the management.

This process requires analyzing the current manual system to identify its shortcomings, such as data duplication, lack of validation, and inefficiency in generating reports. These requirements can be further categorized into functional and non-functional requirements. Profile management, document uploading, data validation, and report generation are considered functional requirements, whereas security, performance, and usability are the non-functional requirements.

Phase two encompasses the design of the system. The system uses a three tier architecture with the tiers being the presentation layer, application layer, and the data layer. Modeling of system behaviors and interactions will be done using UML diagrams like use case diagram, class diagram, and sequence diagram. Database design will be done using relational database design.

This phase deals with development of the system. In developing the system, HTML, CSS, and JavaScript will be used to build the frontend of the system, making it interactive. The ASP.NET MVC core technology will be employed for backend development. ASP.NET MVC follows a Model-View-Controller Architecture. SQL Server will be used as the database management system.

The testing stage is one of the important aspects of this methodology as it involves testing the system for functionalities, performance, and security. The unit testing process will be employed for individual modules, after which integration testing will ensure smooth interaction among various components. In addition, the system testing will involve performance verification while security testing will help in ensuring the absence of any unauthorized access.

In the final step of our methodology, the system will be deployed in a web server for accessing the same by users. Regular maintenance and improvements will ensure improved performance and new features in the system.

IV. IMPLEMENTATION

The deployment of the Faculty Profile Management System entails its actual creation and deployment through modern web development techniques and applications. The system is created as a web application for ease of access, flexibility, and usability in an educational organization setting.

The front-end of the application utilizes HTML, CSS, and JavaScript, which together create a user-friendly and responsive front-end. HTML is used for organizing the contents while CSS enhances the look of the site. In turn, JavaScript creates interactions on the site and enables client-side validation. The front-end of the system makes use of all these three languages and enables easy navigation among various modules, including profile management, document upload, and reports.

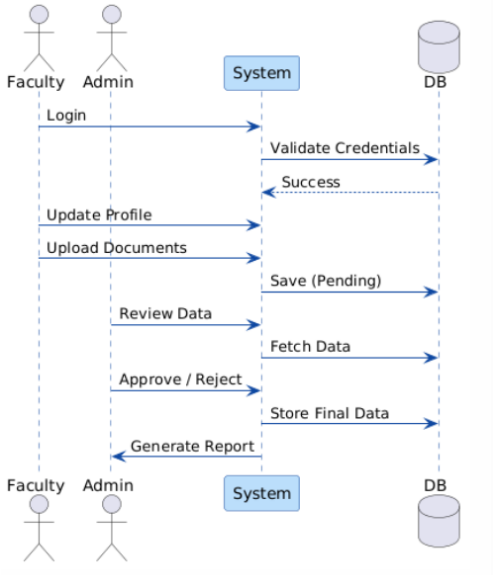

Figure 4.1: Sequence Diagram

The backend system is built using ASP.NET Core, adopting the MVC design pattern. MVC stands for Model View Controller, and it divides the application into three distinct layers, where the model layer deals with data and business logic, the view layer takes care of the presentation layer, and the controller layer deals with user interaction. Role-based authentication and authorization are some of the features used in the backend system.

The Database System will be developed using Microsoft SQL Server, which is a reliable tool for storage and management of data. The Database Design will be created using the process of normalization to ensure that there is no redundancy of information.

Tables representing the entities like faculty details, credentials, research papers, projects, and documents are created.

The steps involved in the workflow process start from the authentication stage, then proceed to profile management and finally document upload. Data submission leads to data storage with pending status and further processing by the administrator for validation. Validation entails acceptance or rejection of data, which when accepted becomes permanent in the database, but when rejected becomes subject to editing. Reports from the data are provided in structured forms using the reporting engine and are valuable for evaluation purposes.

In conclusion, the entire project execution shows that the frontend, backend, and database have been effectively integrated into one system, which is efficient and effective. The application of advanced technology makes the system highly efficient and scalable.

V. REQUIREMENTS

Faculty Profile Management System is built on top of advanced web application technology stack which makes sure that the system is scalable, secure, and provides efficient management of data. The system is comprised of three tiers, namely presentation tier, application tier, and data tier which provides clean separation of concerns within the system and improves overall performance.

Presentation Layer Implementation

The presentation layer will make use of HTML, CSS, and JavaScript to achieve a responsive and interactive interface for users.

Application Layer Implementation

ASP.NET Core will be used to build the application layer. The technology adheres to the MVC pattern and will therefore enable the effective management of business logic and user input.

Data Layer Implementation

Microsoft SQL Server will be utilized in implementing the data layer for storing structured data.

The essential technology/tools employed within the system are outlined below:

- Interface Design and User Interaction: HTML, CSS, and JavaScript
- Backend Programming and Architecture: ASP.NET Core with MVC architecture
- Relational Database Management System: Microsoft SQL Server
- Coding, Debugging, and Testing Platform: Visual Studio
- Execution and Testing Platform: Google Chrome Browser, Microsoft Edge Browser
- Supplementary Tools Used: Bootstrap, jQuery

These choices are made on account of their reliability, widespread use, and compatibility with contemporary trends in web development. ASP.NET Core offers native functionalities including authentication and authorization that will be used to ensure that the confidential data from the academic domain will remain safe from any external breach attempts.

In summary, these technologies present an excellent combination of tools for the development of the Faculty Profile Management System.

VI. RESULTS AND DISCUSSION

The development of the Faculty Profile Management System shows substantial enhancements in the handling and availability of academic data in an organizational setting. This system was tested in real-life scenarios to assess its operational effectiveness, efficiency, and user-friendliness. The outcome of this test proves that the system effectively achieves the desired goals through its role as a repository for storing and maintaining faculty data.

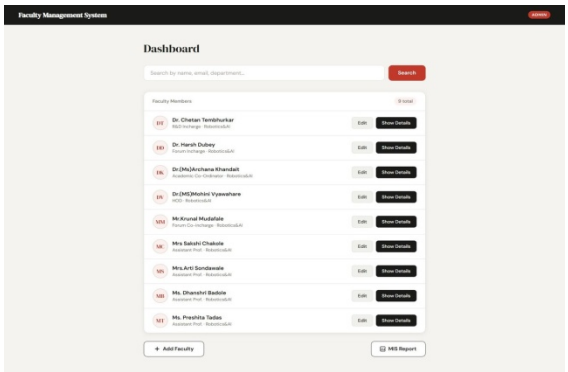

Figure 6.1: Dashboard Module

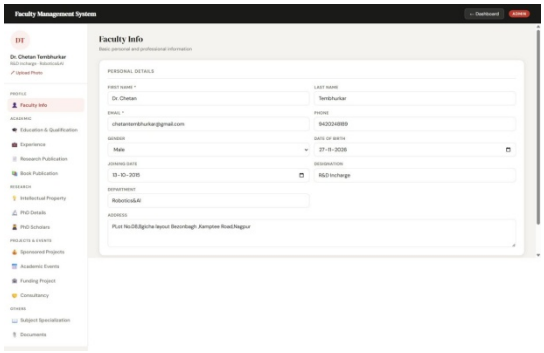

Figure 6.2: Edit Faculty Information

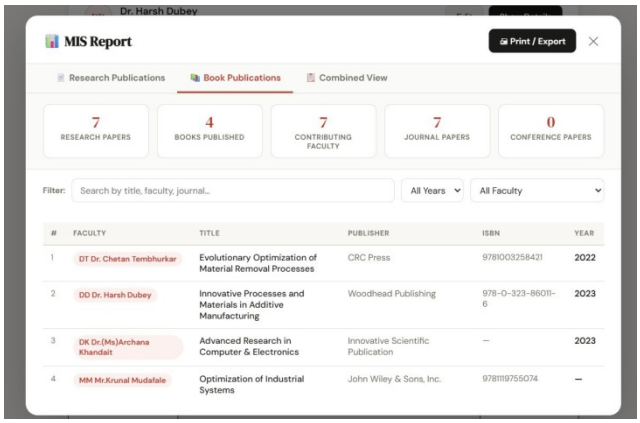

Figure 6.3: MIS Report Module

With the implementation of the system, professors will find it easier to create and modify their profiles, attach documents, and ensure that their academic information is accurate. The system also uses a role-based authentication process to guarantee that the inputted data is verified by authorized persons, ensuring its accuracy and authenticity. Finally, an automated report generation feature is included to generate structured reports that can be utilized in performance evaluation.

After a comprehensive evaluation of the system's performance, the results indicate that the software offers fast response time and allows for simultaneous use by many users without compromising on performance. The system consists of three main components, namely the frontend, backend, and database, which provide a smooth flow of data and ensure effective handling of user requests.

The new system is much better than the conventional way, as it has significantly lowered the workload required to handle administrative procedures while at the same time preventing all kinds of manual entry errors. Contrary to the current approaches, which mainly concentrate on data storage, the new proposal includes validation procedures and reporting features, thereby being a better option.

But there are some limitations too. For instance, internet connection is mandatory for this tool to work properly, and the accuracy of the information depends on the users themselves. Also, some advanced options like prediction analysis and linking with other academic systems are not supported yet.

In general, the results show that the use of this system for academic purposes is efficient and reliable and will contribute to the effectiveness of education process and management.

VII. CONCLUSION

Here, the Faculty Profile Management System presented in this paper emerges to be a viable way of dealing with issues encountered in managing information for learning institutions. Through the application of the proposed solution, the inefficiencies in traditional information management, such as redundancy, inconsistencies, and inefficiencies, can be effectively handled. With the adoption of this solution, information concerning faculty members will be managed efficiently.

Functionality such as profiling, document upload, role-based authentication, and reporting automatically has contributed to improving the efficiency of the system.

Modern technology including ASP.NET Core and SQL Server has been introduced in the system, thus, improving its scalability and efficiency. Accuracy in data management, less administrative work, and faster decision-making have been achieved by introducing this system.

Moreover, the system can facilitate the requirements of the institution concerning accreditation, evaluation of performance, and strategic planning by ensuring that reliable and timely data are available. Although there are some limitations such as user dependence and requirement of an Internet connection, the effectiveness of the system is demonstrated by its performance.

Conclusion

The Faculty Profile Management System can be described as one great milestone on the road towards turning organizations into digital environments, thus providing reliable, scalable, and efficient faculty profiles and decision-making systems.

VIII. ACKNOWLEDGMENT

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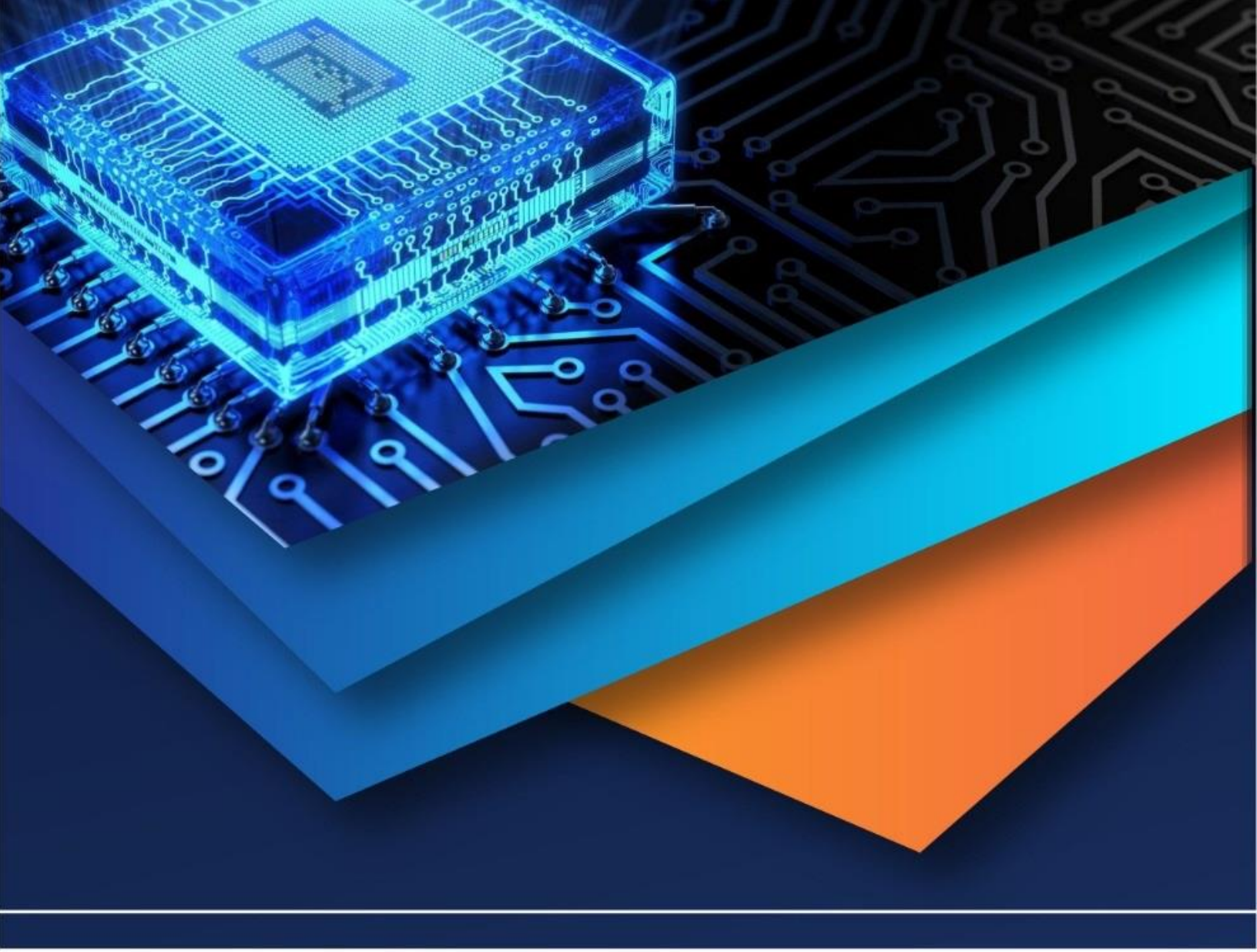

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