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An INTRANET-Based Web Application for College Management System Using Python with Django Web Framework

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Abstract: ***The TECH-STAT-VIEW is a cutting-edge online intranet program with significant implications for universities and academic institutions. This system allows departments or the whole university to track and monitor student attendance in real time. It also provides a platform for viewing and searching college-related information, as well as receiving updates on grades, leaves and staff attendance. Staff employees have the ability to easily upload and download information to the database. Users must first register and be allowed access based on their identification as a student to the specific staff member in order to fully utilize the system's capabilities to view or modify information. The intranet-based TSV platform's ultimate goal is to provide easy access to information at all levels of organizational management, acting as a complete knowledge and information management system. Using the Django framework, developers may create a strong and scalable web application with a user-friendly interface that is simple to maintain. The Python programming language, with its many libraries and tools, provides the resources required to create sophisticated and feature-rich programs. The Python programming language and the Django framework work well together to create a college administration system that satisfies the demands of current educational institutions.***
Keywords: Intranet, Student, Staff, Management, Web application, Python with Django Web Framework

I. INTRODUCTION

People's interactions with objectives have changed as a result of the digital era. Many large organisations and corporations want digital connectivity and effective communication. Most websites, however, fall short of their goals owing to sluggish loading times, insufficient security measures, integration difficulties with other systems, and obsolete or bad design. To solve this, we have combined cutting-edge technology with a contemporary flair. "Tech-Stat-View" is the name of the project (TSV). TSV is defined as an intranet-based application that offers information to all levels of management inside a company. This system may be used by the college as an information management system. The administrator generates a login ID and password for a specific student or staff person (technical or non-technical), and with these, the student or staff member (technical or non-technical) may access the system to upload or download data from the database. While Django will hold the business logic in the middle layer, the front-end will be made up of HTML pages for client-side validation with Java Script. These layers will be interacted with by the SQLite database, which is the third tier of the database stack. Tomcat 5.5 would serve as the web server is preferable to have experience with Python, Django, and SQLite in order to accomplish this project. Developers may use the Django framework to create a secure, scalable, and adaptable online application that can be easily maintained and changed over time. Python, with its vast community and extensive library, is a strong and adaptable programming language for developing sophisticated applications. These characteristics make the Python-Django combo excellent for developing a complete college administration system that fits the demands of modern educational institutions.

A. General Characteristics

The Tech Stat View system using Python and Django is designed to help manage and organize the day-to-day operations of a college or educational institution. Some of the key features of the system include:

1) *Student Management:* The system allows colleges to register new students, store and manage their information, and track their academic progress.
2) *Course Management:* The system provides the ability to create and manage courses, assign teachers, and manage student enrolments.

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3) *Class Scheduling:* The system enables colleges to create class schedules and assign classrooms, as well as manage changes and updates to the schedules.
4) *Grade Tracking:* The system provides a platform for teachers to enter and manage student grades, and for students to access their grades online.
5) *Staff Management:* The system allows colleges to manage and track the information of their staff members, including their schedules and responsibilities.
6) *Notifications:* The System allows to send notifications and alert with a subjective heading to the lower tier members.
7) *Feedback:* The systems provides a form to respond the feedback and receive to the different tiers of the management .
8) *Leave Approval:* The system allows the administrator to approve or reject a leave application of the student or staff with the subjective description.

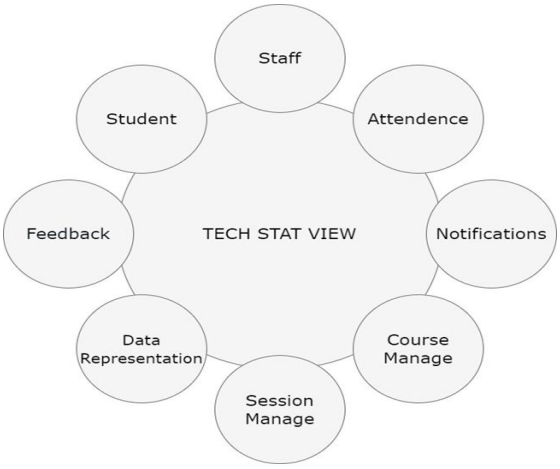


Fig.1 Basic Functionalities

II. RELATED WORK

The research in which the data is gathered from primary sources. A questionnaire is used to collect replies, and analysis was performed depending on the information provided by the respondents. Excel is used for analysis, and are designed to be clearly outlined.

A. Data Representation

In the survey and rating of current communication and information technologies such as WhatsApp, Teams, Text Messages, Email, and college portal websites, many students choose the website as the best option because the information is stored in a processed way and is easy to access without any irrelevant data being posted, as opposed to WhatsApp, Teams, Emails, and Text, which store all sources of data such as spam, promotions, and other information. So creating a interactive and fast processing websites using Django web framework helps them to keep in loop.

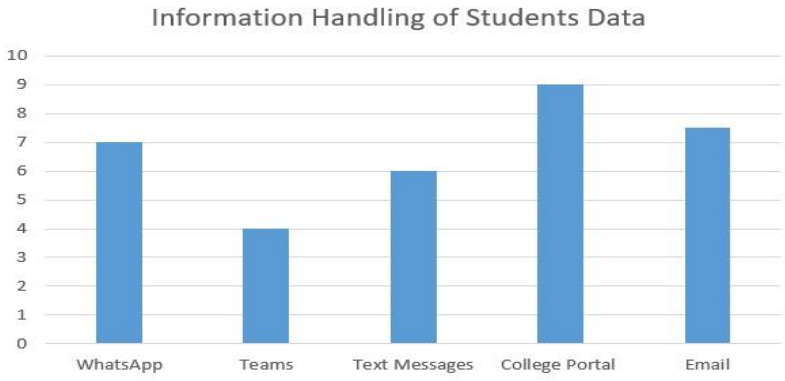


Fig.2 Ratings of different technologies which students are inclined to use

B. Internet Usage of Undergraduate Students

Students typically use the internet for more than 10 hours per week, or at least 8 hours per week. This means that university students' internet usage pattern can be considered an addictive attitude since more than 10 hours of internet usage in a week is stated as an addiction behaviour attitude. However, this can be changed by introducing college websites as alternatives to technologies that can effectively prevent untrustworthy social media additions and unnecessary diverting spam for students during research or communication [13].

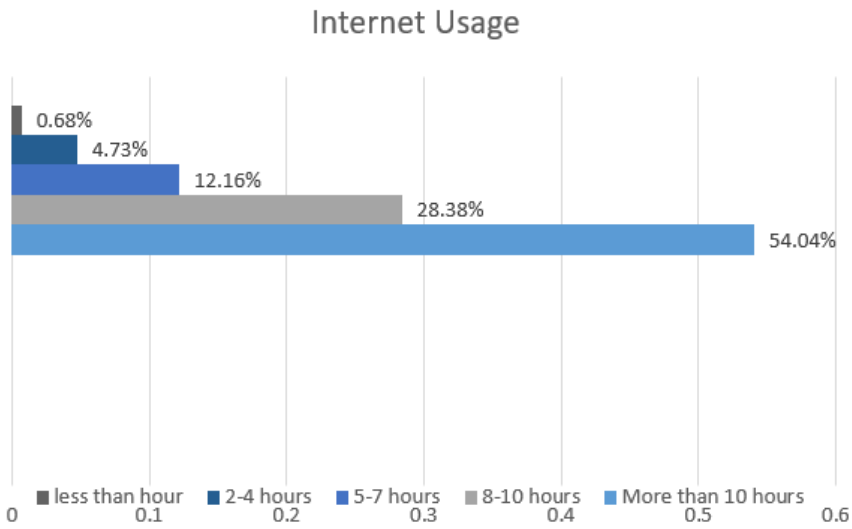


Fig.3 Internet usage hours per week

III.PROPOSED SYSTEM

The proposed system could include features such as student enrolment, course registration, faculty management, attendance tracking, grade tracking, and financial management. The system could also allow for communication between students, faculty, and administrators through messaging or discussion boards. Security measures such as user authentication and access control could be implemented to protect sensitive data.

The following are some of the advantages of adopting Python and the Django web framework over existing solutions:

1) *Scalability:* Django is a highly scalable framework, which makes it simple to handle growing system demand as the college expands.
2) *Python:* It is a flexible language that allows developers to add new features and customise their code as needed[12].
3) *Django:* It has a lot of built-in features that allows developers to design complicated systems rapidly.
4) *Security:* Django includes built-in security capabilities, such as protection against cross-site scripting and SQL injection threats, which aid in the safety of sensitive student and staff data.

- The system could support multiple user roles, such as student, faculty, administrator, and parent/guardian, with corresponding permissions and access levels.
- The system could include dashboards and reports that provide an overview of key metrics, such as enrolment numbers, course completion rates, student progress, and financial performance.
- The system could integrate with other tools and systems, such as learning management systems, library management systems, and student information systems, to provide a more comprehensive solution.
- The system could be scalable and adaptable to meet the evolving needs of the college, such as adding new programs, courses, or departments, or accommodating changes in policies or regulations.
- The system could be designed with security in mind, using best practices for data encryption, access control, and vulnerability management, and complying with relevant privacy laws and regulations[8].
- The system could be tested and optimized for performance, using load testing and monitoring tools to ensure that it can handle high volumes of traffic and usage.

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A. Implementation

In order to successfully implement and develop the website, we need a stable version of Python, a SQL database, a Web server, and an Integrated Development Environment (IDE). To have smooth functions and integrate modulation into the server from the backend, minimal hardware requirements are required with the Windows 8, Intel Pentium 4, and 4 GB RAM configuration.

A TSV system built using the Django web framework in Python can work as follows:

1) *Data Modelling:* The first step in building the system is to create a data model that represents entities like students, teachers, courses, etc. in the Django ORM (Object-Relational Mapping).
2) *URL Configuration:* Next, the URLs for the system are defined in the URLConf (URL Configuration). This allows users to access different pages and features of the system by navigating to specific URLs.
3) *Views:* Views handle user requests and generate the appropriate response. In Django, views can be implemented as functions or class-based views. They can interact with the data model to retrieve or modify data and render the appropriate template to the user.
4) *Templates:* Templates in Django define the HTML structure of the pages that are displayed to the user. They can be customized to add branding, navigation, and other elements to the page.
5) *Forms:* Forms are used to allow users to input data into the system. In Django, forms can be created using the built-in form class or by using the model form class, which automatically generates a form based on the data model.
6) *Authentication:* Django provides a built-in authentication system that can be used to control access to the system and manage user accounts.
7) *Deployment:* Once the system is complete, it can be deployed to a server for users to access..

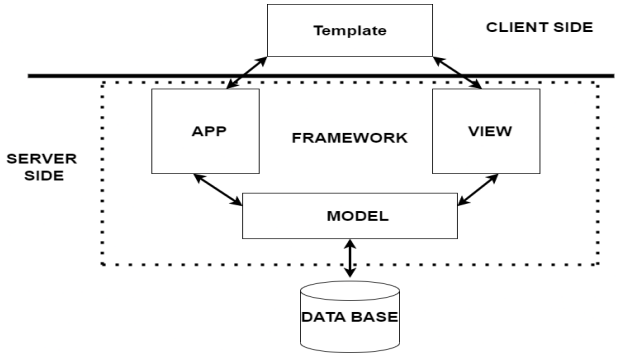


Fig.4 Client and Server Working

Models define the data structure and behaviour of the application. They are responsible for the persistence of the data and provide an easy-to-use interface to the database. Django provides a powerful object-relational mapping (ORM) layer that makes it easy to work with different types of databases

B. Data Flow Diagrams

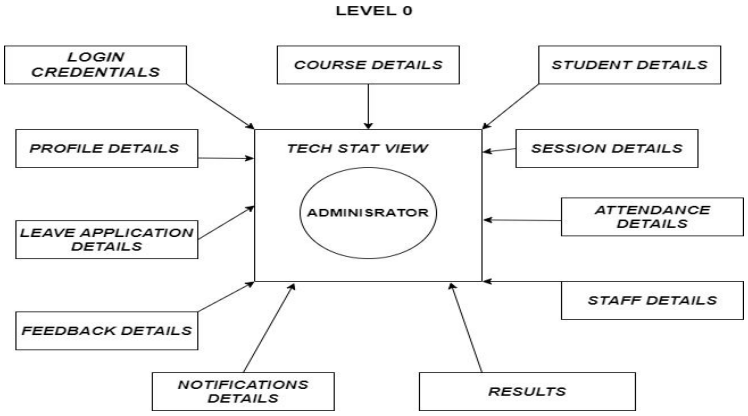


Fig.5 Administrator Controls and Data Flow

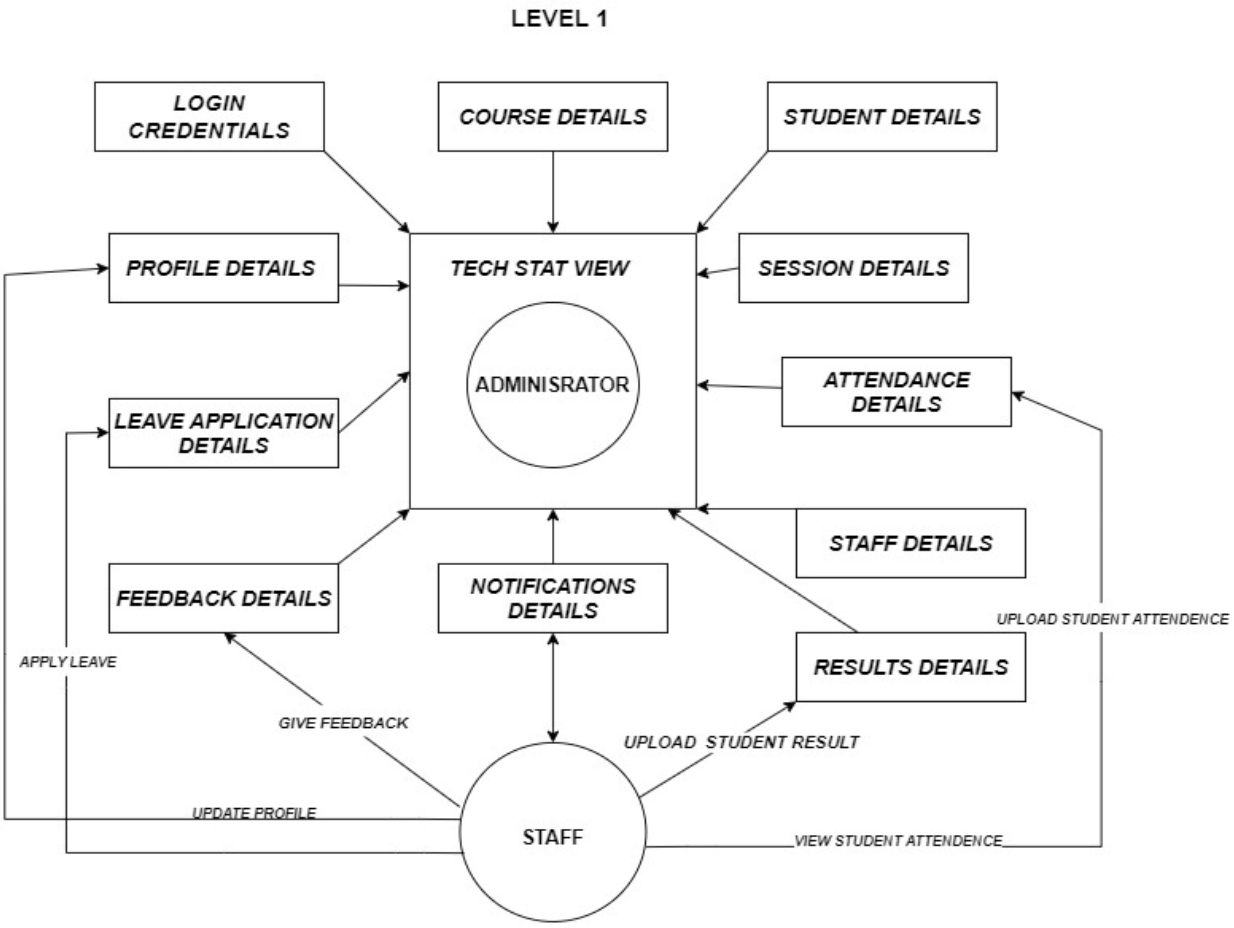


Fig.6 Staff controls and data access

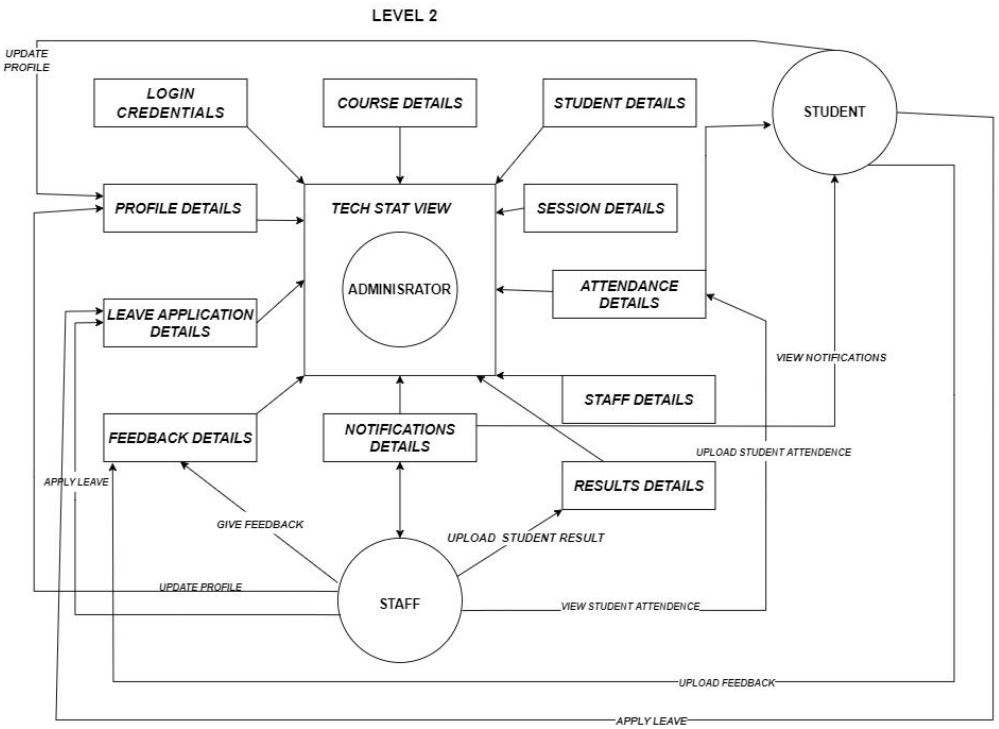


Fig.7 Student control and data view

IV. RESULTS & DISCUSSION

Ultimately, creating a system with the Python programming language and the Django web framework might be an effective way to manage many academic activities. Django provides a strong framework with built-in tools for user authentication, database administration, and security, making it an excellent choice for developing a large-scale online application such as a system. Furthermore, Python is a flexible programming language with a big variety of libraries and frameworks, making it easy to build the many capabilities necessary in a college administration system. The use of Django and Python can lead to faster development time and easier maintenance, as these technologies are well-documented and have a large community of developers to support them[2]. The Django admin interface can also be used to manage various aspects of the system, such as student information, course offerings, and staff information, reducing the time and effort required for manual data entry. the modular nature of the Django framework enables developers to add new functionalities or modify existing ones as needed, making the System highly customizable. Additionally, the use of Python and Django also provides opportunities for integration with other third-party tools and services, such as online payment systems. In essence, the combination of Python and Django gives a solid basis for developing a robust and efficient system. These technologies are an excellent alternative for developing online applications in the education industry because to their flexibility, scalability, and security[4].

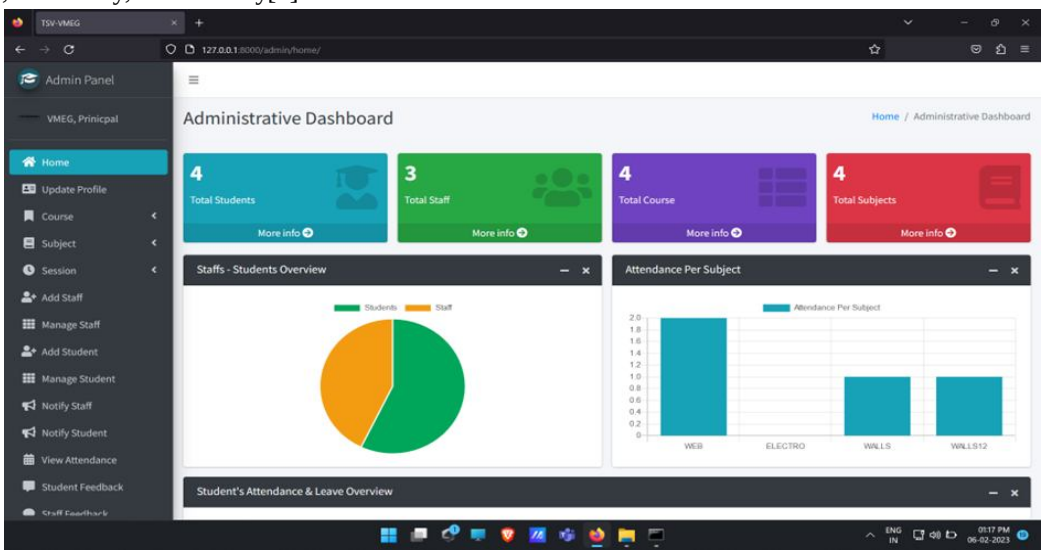


Fig.8 Output Screen Showing Administrator

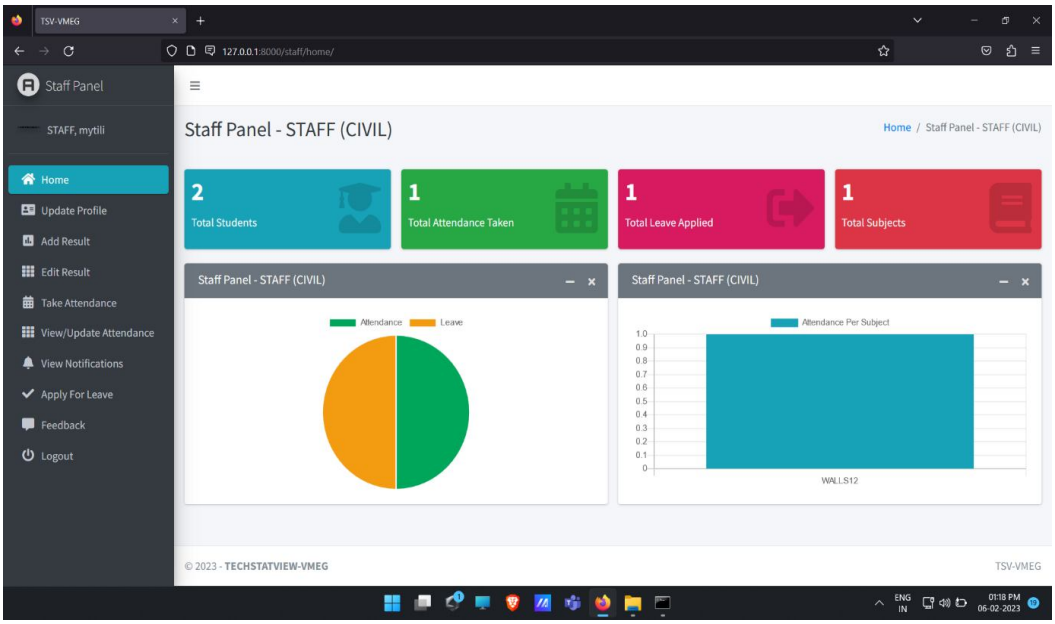


Fig.9 Output Screen Showing Staff

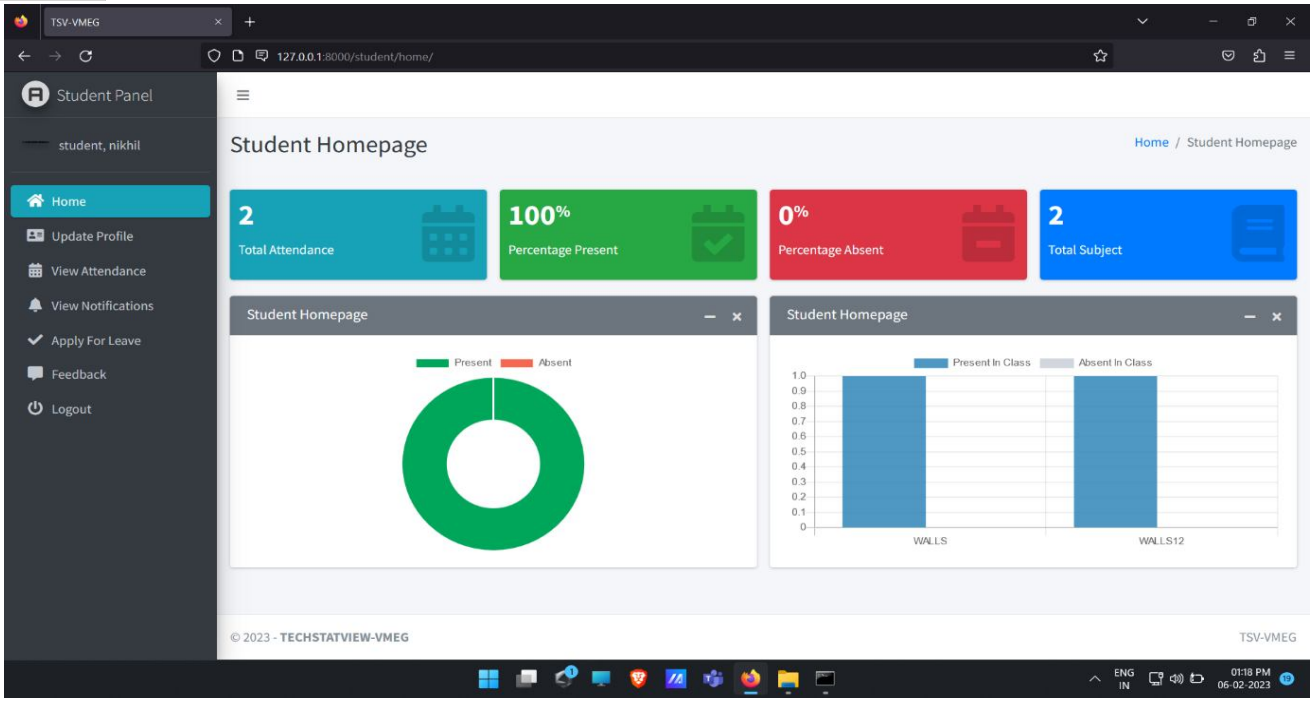


Fig.10 Output Screen Showing Student

V. CONCLUSION

The Tech Stat View System built using Python with Django web framework can improve the administrative and academic processes of colleges and universities. It can provide a secure, efficient, and user-friendly platform for managing student data, delivering course materials, and tracking academic performance. Furthermore, the integration of emerging technologies can enhance the system's functionality, making it more adaptable to the changing demands of the education sector[7]. The System has significant potential to streamline administrative and academic processes, and the Django web framework provides an excellent platform for developing such a system using Django web framework can help develop the with features like user authentication, session management, and secure data storage. This ensures that the system is secure, and user data is protected. Additionally, the web framework provides easy integration with different databases, making it easy to store, retrieve, and update data. The System helps in improve the communication between students, faculty, and administrators[9]. It has the potential to enhance administrative and academic procedures, ease communication, and aid in student achievement. The system may potentially be improved by incorporating upcoming technologies and benefiting from the Django web framework's community assistance. With the growing demand for online education, the Tech Stat View System is a must-have tool for schools and universities looking to adapt and survive in the twenty-first century.

VI. FUTURE SCOPE

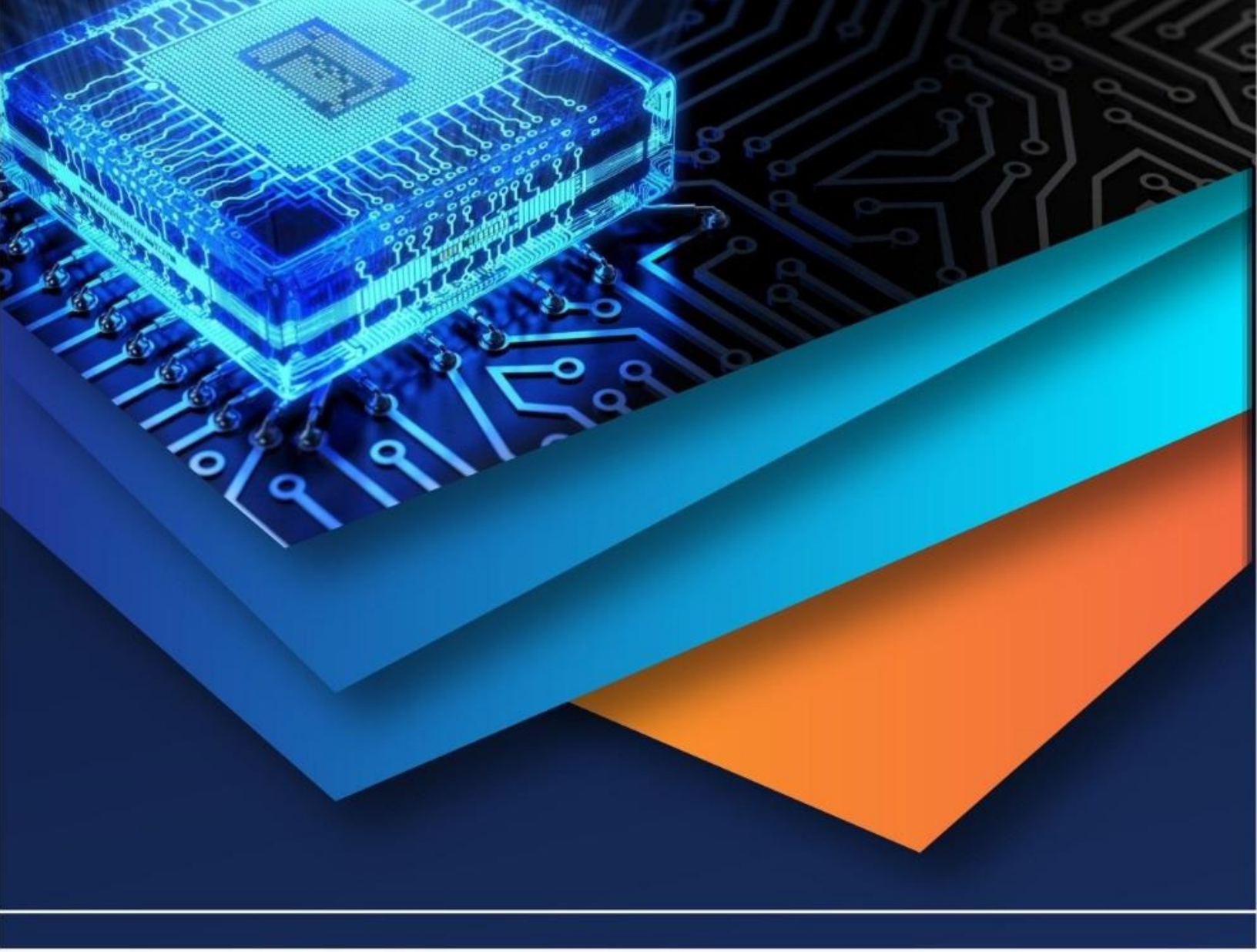
Interaction with other technologies to give a more complete picture of student and staff data, the system may be combined with other systems utilised by the institution, such as financial management and student information systems. Mobile interface and mobile application might be created to allow students, faculty, and administrators to access the system via their mobile devices from anywhere. Enhanced Decision-Making to give insights and enable data-driven decision-making, the system may be improved with data analytics and reporting capabilities. Improved User Experience by system's user interface and experience can be enhanced to create a more intuitive and user-friendly experience. Increased Automation system may be automated to decrease human labour and boost efficiency, such as automatic report and notification generating. AI integration can improve the System by automating tasks such as grading, scheduling, and data analysis. This can lead to more accurate and effective resource management at the college. Integration of blockchain technology may be used to establish secure and tamper-proof records of academic accomplishments such as degrees, diplomas, and transcripts. This can increase academic credentials' openness, legitimacy, and mobility. Student analytics may be used to analyse student performance, identify areas for improvement, and give individualised learning suggestions. This can assist teachers in developing successful teaching tactics and improving student results.

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REFERENCES

[1] Forcier, J., Bissex, P. and Chun, W.J., 2008. Python web development with Django. Addison-Wesley Professional.
[2] Liawatimena, S., Warnars, H.L.H.S., Trisetyarso, A., Abdurahman, E., Soewito, B., Wibowo, A., Gaol, F.L. and Abbas, B.S., 2018, September. Django web framework software metrics measurement using radon and pylint. In 2018 Indonesian Association for Pattern Recognition International Conference (INAPR) (pp. 218-222). IEEE.
[3] Gore, H., Singh, R.K., Singh, A., Singh, A.P., Shabaz, M., Singh, B.K. and Jagota, V., 2021. Django: Web development simple & fast. Annals of the Romanian Society for Cell Biology, 25(6), pp.4576-4585.
[4] Thoutam, V., 2021. A Study On Python Web Application Framework. Journal of Electronics, Computer Networking and Applied Mathematics (JECNAM) ISSN: 2799-1156, 1(01), pp.48-55.
[5] Bruno, V., Tam, A. and Thom, J., 2005, November. Characteristics of web applications that affect usability: a review. In Proceedings of the 17th Australia conference on Computer-Human Interaction: Citizens Online: Considerations for Today and the Future (pp. 1-4).
[6] Erickson, W., Trerise, S., Lee, C., VanLooy, S., Knowlton, S. and Bruyère, S., 2013. The accessibility and usability of college websites: is your website presenting barriers to potential students?. Community College
[7] Ravindran, A., 2018. Django Design Patterns and Best Practices: Industry-standard web development techniques and solutions using Python. Packt Publishing Ltd.
[8] Challapalli, S.S.N., Kaushik, P., Suman, S., Shivahare, B.D., Bibhu, V. and Gupta, A.D., 2021, November. Web Development and performance comparison of Web Development Technologies in Node. js and Python. In 2021 International Conference on Technological Advancements and Innovations (ICTAI) (pp. 303-307). IEEE.
[9] Bharamagoudar, S.R., Geeta, R.B. and Totad, S.G., 2013. Web based student information management system. International Journal of Advanced Research in Computer and Communication Engineering, 2(6), pp.2342-2348.
[10] Holovaty, A. and Kaplan-Moss, J., 2009. The definitive guide to Django: Web development done right. Apress.
[11] Chandiramani, A. and Singh, P., 2021. Management of Django Web Development in Python. Journal of Management and Service Science (JMSS), 1(2), pp.1-17.
[12] Swacha, J., 2018. Development and evaluation of an interactive Python course. In ICERI2018 Proceedings (pp. 456-466). IATED.
[13] Müjgan Hacıoğlu Deniz, Seda Karakaş Geyik,An Empirical Research on General Internet Usage Patterns of Undergraduate Students,Procedia - Social and Behavioral Sciences,
[14] Power, D.J. and Kaparthi, S., 2002. Building Web-based decision support systems. Studies in Informatics and Control, 11(4), pp.291-302.
[15] Hourieh, A., 2008. Learning Website Development with Django. Packt Publishing Ltd.

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