

Cloud based College ERP System Using Django

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Abstract - The Technological advancements in the area of Education has helped Students as well as mentors in very different ways. Specifically in the time of pandemic the students were totally cut off from the studies and they were not able to continue with their academics. In these kinds of times technology gives us a way to make things better. This research paper is a representation of a educational website which helps students to connect with their mentor as well as their mates. This website helps students and teacher to keep track of the progress in the studies as well as to check out details such as marks, attendance, assignments etc. This website is based on Django Framework. The frontend is developed using HTML, CSS, Bootstrap 5, and the backend is done with Django language. Database used is SQL and RDBMS used is MySQL. Google cloud is used as cloud Platform which makes it more secure and robust. This website makes work of student and mentors easy and save their time. It is user friendly, simple to use and Efficient at the same time.

Keywords: - ERP system, Django, python, Cloud computing.

I. INTRODUCTION

The objective of College ERP System is to allow the administrator of any organization the ability to edit and find out the personal details of a student and allows the student to keep up to date his profile. It will also make it easier to maintain track of all of a student's information, such as their ID, name, mailing address, phone number, and date of birth. As a result, all of a student's information will be available in a matter of seconds. Overall, it will make the administrator's and students' jobs easier when it comes to Student Information.

The main purpose of this project is to illustrate the requirements of the College Information Management System and is intended to help any organization to maintain and manage personal data. It's a large-scale initiative that was built from the ground up to meet the needs of institutions in guiding their pupils. This integrated information management system combines daily operations

in the college setting, from attendance management to student-teacher communication. This eliminates data entry errors and guarantees that data is kept current throughout the college. It gives you a single data repository to streamline your procedures and for all reporting needs. It offers a basic and intuitive user interface. As a result, users will spend less time learning the system and, as a result, will be more productive. Effective security measures ensure data privacy and, as a result, boost productivity.

II. EXISTING SYSTEM

A college, as we all know, is made up of various departments, such as course departments, fees management, library management, and event management, to name a few. In comparison to the past, the number of applications and uses of information technology has expanded, and each of these unique departments now has its own computer system to perform their own functions. They can engage with one other from their own systems because there is only one core system.

There are systems which are providing solutions for different problems but most of them are paid and costly, some of them are not even secure. Most important thing is that none of them is fully oriented according to our university. Every institute has its different methodology and way of managing things, so we came up with the solutions to the specific drawbacks and flaws according to our university. Plus, we are using cloud Technology here to make this system robust and secure. Using cloud will make this system more reliable and all the data will be available in milli-seconds and will be secure, all the data can be used remotely and the whole system will be scalable and efficient Proposed approach.

III. PROPOSED SYSTEM

A. Software Development Life Cycle

The Software Development Life Cycle, or SDLC, is a method for producing high-quality, low-cost software in the least amount of time. SDLC is a well-structured flow of stages that enables a company to swiftly develop high-quality software that has been thoroughly tested and is ready for production.

As stated in the introduction, the SDLC is divided into six phases. SDLC models that are widely used, Popular SDLC models include the waterfall model, spiral model, and Agile model.

B. SDLC Model

A software life cycle model is a diagram that depicts the software development process. The software development model aids the developer in deciding on a software development strategy. A software development model has its own set of tools, processes, and procedures that define the software development life cycle and are clearly articulated. This project has been developed using the Iterative model.

In this Model, you can start with some of the software specifications and develop the first version of the software. If the software needs to be changed after the first version, a new version of the software is developed with a new iteration. Every release of the Iterative Model finishes in an exact and fixed period that is called iteration. The Iterative Model allows the accessing earlier phases, in which the variations made respectively. At the end of the Software Development Life Cycle (SDLC) procedure, the project's final result was renewed.

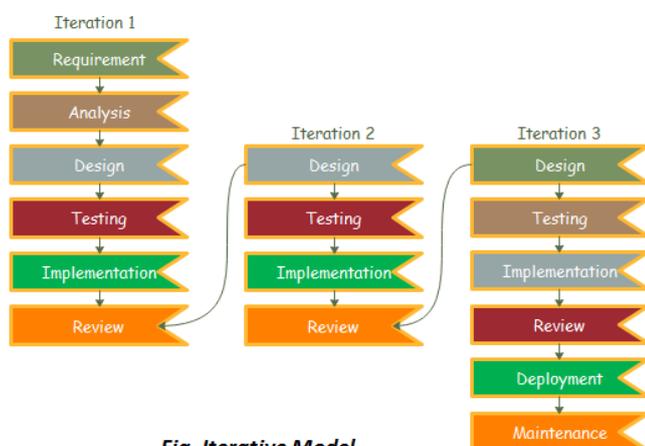


Fig. Iterative Model

- The complete system's specifications may be determined and comprehended.

- Significant specifications are determined, while few functionalities and needed improvements emerge with the development process's procedure.
- The development team will use the most up-to-date technology and will continue to acquire it as the project progresses. This may change in the future if there are few significant risk characteristics and purposes. The unreachable sources with the relevant skills that are arranged to be used based on a contract for specific iterations.

IV. TECHNOLOGY USED

A. Frontend

1. HTML - Hypertext Markup Language (HTML) is the abbreviation for Hypertext Markup Language. It's a markup language that's used to create web pages. HTML is a markup language that combines hypertext with markup. The term "hypertext" refers to the link between web pages. The text document within the tag that defines the structure of web pages is defined using a markup language.
2. CSS - CSS (Cascading Style Sheets) is a stylesheet language that is used to make a webpage more appealing. CSS is used to make the process of making web pages presentable easier. Styles can be applied to web pages using CSS. More crucially, CSS allows you to do so without having to worry about the HTML code that makes up each web page.
3. Bootstrap - Bootstrap is a toolkit for building responsive websites and web applications that is free and open-source. It is the most widely used HTML, CSS, and JavaScript framework for creating mobile-first, responsive websites. Nowadays, webpages are optimized for all browsers (Internet Explorer, Firefox, and Chrome) and screen sizes (Desktop, Tablets, Phablets, and Phones). All thanks to Bootstrap developers – Mark Otto and Jacob Thornton of Twitter, though it was later declared to be an open-source project.
4. jQuery/JavaScript — JavaScript (JS) is an interpreted high-level programming language. Curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions are all features of JavaScript. JavaScript is one of the essential technologies of the World Wide Web, alongside HTML and CSS (Flanagan, 2006). JavaScript is a programming language that enables interactive web pages and is an important component of web applications. The vast majority of websites use it, and major web browsers have a

dedicated JavaScript engine to execute it.

B. Backend

1. Python - is a high-level programming language that is interpreted, interactive, object-oriented, and general-purpose. Guido van Rossum designed it between 1985 and 1990. Python source code is also available under the GNU General Public License, just like Perl (GPL). This tutorial provides sufficient knowledge of the Python programming language.
2. Django - is a high-level Python Web framework that promotes rapid development and simple, pragmatic design. It was built by experienced developers to take care of a lot of the headaches of Web development, allowing us to focus on creating our app instead of reinventing the wheel. It's open source and free. Django's main purpose is to make building complex, database-driven websites easier. The framework prioritizes component reusability and "pluggability" over code. Python is utilized everywhere, including in the configuration files and data models. Django also has an administrative create, read, update, and delete interface that is produced dynamically and customized using admin models. Django 3 was utilized throughout the entire process.
3. Jinja2 - Jinja2 is one of the most used Python template engines. It is based on Django's templating system, but it adds an expressive language to provide template authors with more powerful tools. It includes a sandboxed execution mode, which means that every part of the template execution is watched and expressly whitelisted or blacklisted, depending on your preferences.
4. SQLite - SQLite is a C-language library that implements a full-featured SQL database engine that is tiny, quick, self-contained, and high-reliability. The SQLite database engine is the most widely used database engine on the planet. SQLite3 was Django's default database by default. Using the Python programming language, Django gives a special technique to define our database.
5. Google Cloud Platform - Google Cloud Platform (GCP) is a set of cloud computing services supplied by Google that run on the same infrastructure as Google's internal end-user products, such as Google Search, Gmail, file storage, and YouTube. It offers a number of modular cloud services, including computing, data storage, data analytics, and machine learning, in addition to a set of management tools.

V. METHODOLOGY

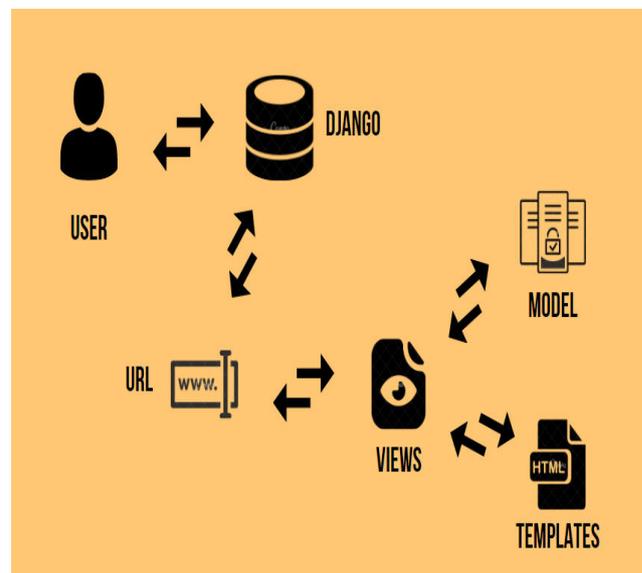
The Django framework is used to create the backend system.

The MVT (Model-View-Template) architecture is used by Django. MVT is a web application development software design pattern. The three sections of the MVT Structure are as follows:

Model: The model will serve as the data's interface. It is in charge of data management. A database represents the logical data structure that underpins the entire application (generally relational databases such as MySQL, Postgres).

View: The user interface — what you see in your browser when you render a website — is known as the View. HTML/CSS/JavaScript and Jinja files are used to represent it.

Template: A template is made up of both static sections of the desired HTML output and specific syntax that describes how dynamic content will be included.



MVT Model

A user requests a resource from Django, and Django acts as a controller, checking the URL for available resources.

If URL mapping is used, a view is created that interacts with the model and renders a template.

Django responds to the user by sending a response template.

The system was created with all of the criteria in mind, and it is a system that makes the website easy to use. Admin gets access to all accounts and all student and instructor information, and he can manage everything. Students can see their grades, attendance, and other information, as well as submit assignments. Teachers can update marks and

attendance, submit and mark assignment. Key stakeholders are Teacher and Student. System is very reliable and efficient.

- User Registration
- User Login
- Administrator Login
- Administrator can access every account and details, admin can add and remove users as per norms, he can add class, course and time table, plus the admin assigns the class to every student and teacher.
- Teachers can post assignments, update marks and attendance, add remarks and have discussion with students.
- Students can see their attendance, marks, see assignment and submit it. They can also track progress of their individual course and studies.
- The User will see resources relevant to its own University only.
- Separate Account Page for each User.

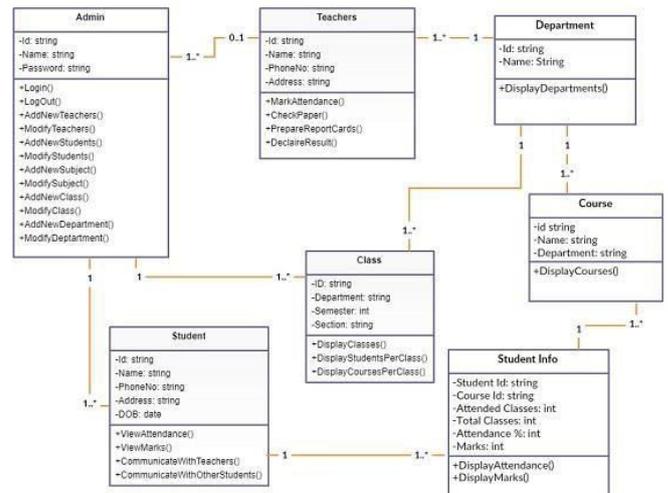
As a templating language, we used Jinja2. Jinja is a templating engine that is quick, expressive, and extendable. The template has special placeholders that allow you to write code that looks like Python syntax. After that, data is supplied to the template in order to render the final document.

We used Google Cloud Platform for cloud storage, which makes the entire system more stable and safer. It is less expensive than other platforms, has greater performance, and is 99.9% durable, with redundant backup to ensure that the customer's data is never lost.

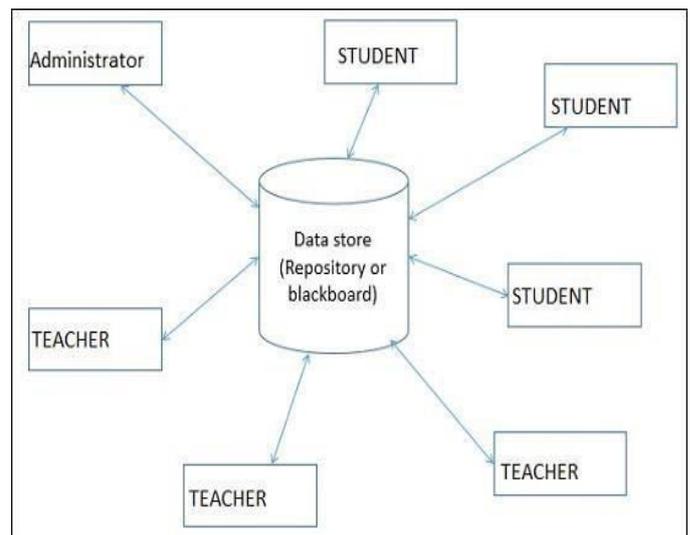
VI. CHALLENGES

Because this project was created during a pandemic, the main challenge was that the members were unable to communicate effectively and discuss the overall situation; retrieving information and data was also difficult because some members were experiencing issues with their internet connection and network.

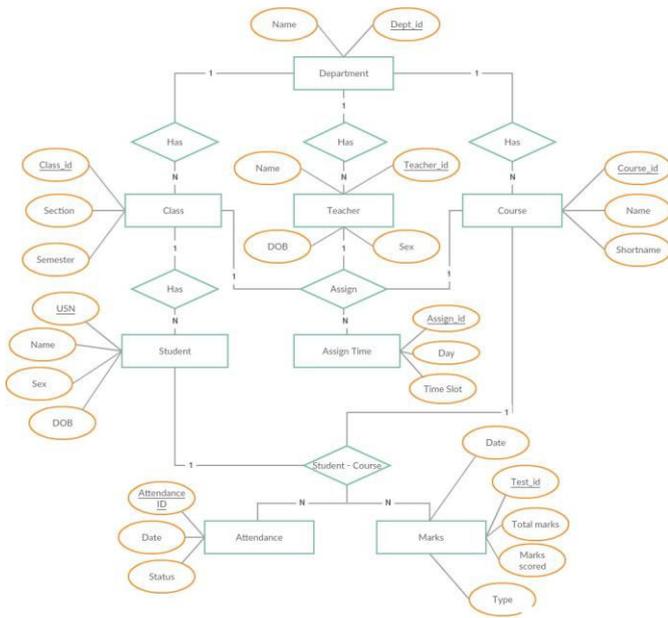
ARCHITECTURE



Class diagram of the proposed system



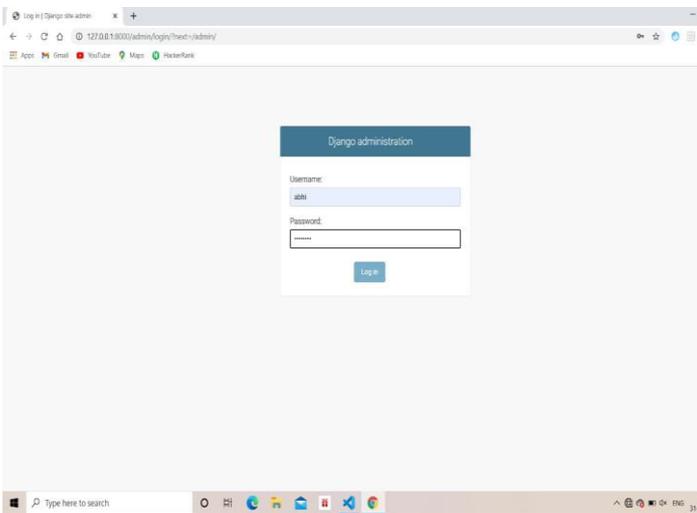
Architectural schema



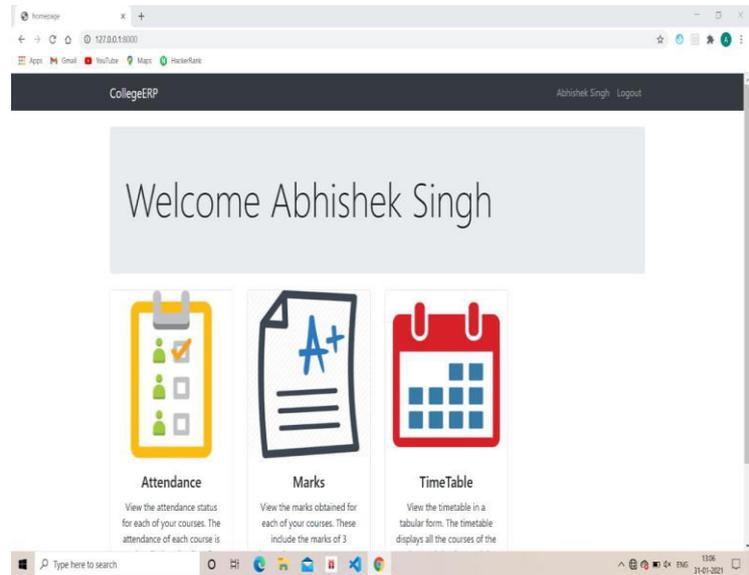
ER Diagram of system

VII. RESULT

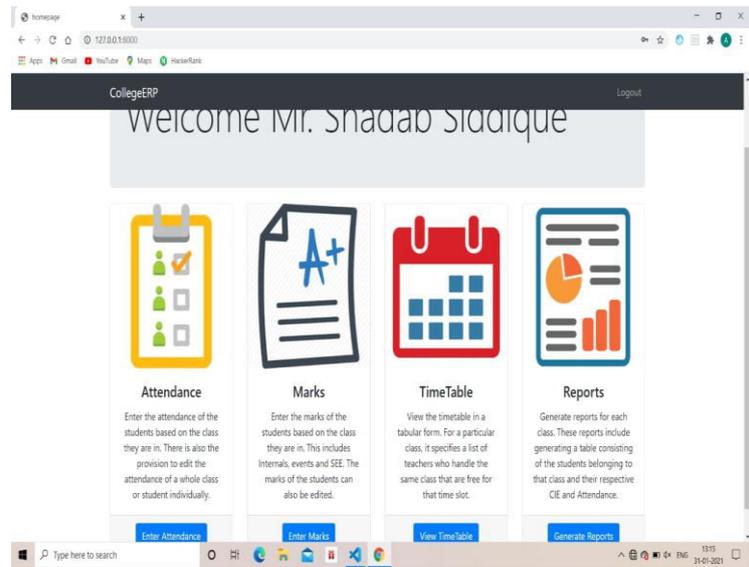
Here are some few snaps from the build website.



Login page



Students panel

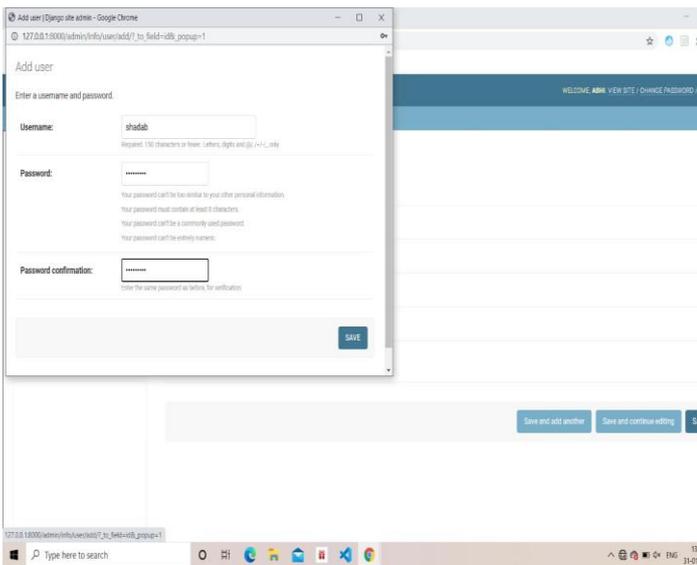


Teachers Panel

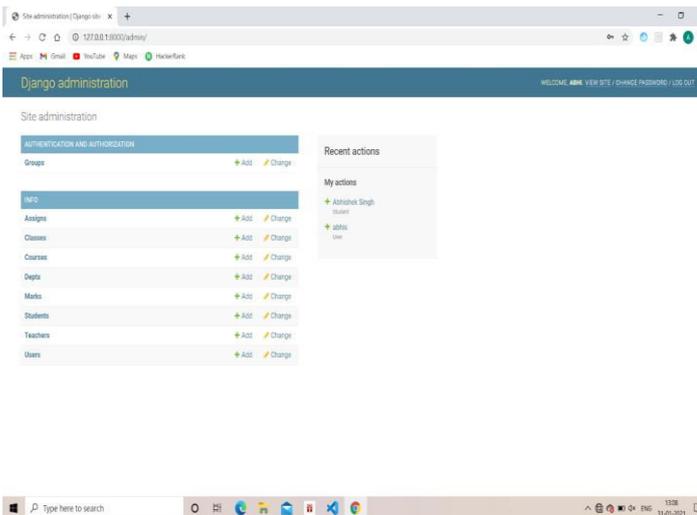
and roles in the system. This project is designed keeping in view the day-to-day problems faced by a college system.

As a result, the administrator's fundamental problem of maintaining and controlling work is solved. Prior to this, keeping track of the daily routine and maintaining the time table was a bit of a challenge. However, by creating this web-based application, the administrator can enjoy the task, complete it with ease, and save time. The amount of time spent is minimized, and manual calculations are eliminated; reports can be provided on a regular basis or as needed by the user. The proper sharing and distribution of tasks, as well as the provision of precise outcomes. The storage facility will make the operator's job easier. As a result, the system created will benefit the administrator by making his/her job easier.

This system automates admissions and eliminates the need for manual processing. This is a work that does not require the use of paper. It can be controlled and monitored from afar. It decreases the amount of manpower needed. It always delivers accurate facts. The information accumulated throughout the years can be preserved and retrieved at any time. The information in the repository assists management in making informed decisions and producing reliable results. The storage facility will make the operator's job easier. As a result, the system established will benefit the administrator by making his or her job easier by providing correct findings. The System Development Model's approach can be utilized as a road map for efficiently developing comparable types of Web applications.



Admin Module



Django administrator

VIII. CONCLUSION

Accessing information from files using the existing system is complicated, and there is no quick and easy way to retain student and staff records. The Existing System also has a lack of automation. The goal of Our System is to reduce burden and save substantial time for employees.

The project's title is college ERP system is a system that manages the challenges that arise at a certain institution. It is extremely beneficial to both students and professors to have easy access to information. Users receive relevant information from the college ERP based on their profiles

IX. FUTURE SCOPE

In addition, a few more features can be added to the project in the future. Some of the features that have been added include using the platform as an online assignment submission platform, creating a chatroom with teachers and students from a specific university/college, and introducing digital payment methods to make transactions easier.

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XI. REFERENCES

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