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Django , The Python Web Framework

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Abstract : Academic technological implementations have aided students and professionals in a variety of ways. The availability of all educational resources is extremely beneficial to students in their academic endeavors. The paper depicts a website concept that allows students to obtain class notes, previous year question papers, and syllabuses, as well as sell their old books, all from the same digital platform. The function of software engineering in project development is also discussed in the article. The project is built on the Django Framework, with the backend written in Python, Jinja2, and Mysql.HTML, CSS, and Java make up the frontend. In the development process, appropriate SDLC Model and Testing procedures were employed. Each step of the SDLC Model (Iterative Model) is clearly discussed, with accompanying ER Diagrams and Flow Charts. The project that was created is extremely efficient, user-friendly, and straightforward.

Software Engineering, Django, HTML, CSS, SDLC, Python, Testing are all terms that can be found in the index.

I. INTRODUCTION

The availability of various materials on various digital devices has made our life easier and more simple in this era of digitalization. There are many educational internet sites who exchange educational resources such as short notes, video lectures, presentations, and publications in the academic field as well. However, none of them supply class notes or question papers for courses taught at a specific institution or university, and most students encounter the difficulty of not receiving class notes or previous year model question from seniors due to the lack of interaction from fellow classmates or seniors. Taking these issuesinto account, the concept of an online forum was born.

Shreic was created as a platform for resource exchange (Sharing Resources In Campus). The concept is to put all of a college's or university's class notes and previous year question papers in one place. In addition, when students finish a course in college, they either sell their books to junkyards or give them to their juniors. Only a few of them have those books. As a result, the website also functions as an e-commerce platform, allowing users to sell or donate old books according to their preferences. As a result, the site functions as an e-commerce platform.website where you can sell or give old books according to your wishes seller's position.

The Django framework is used to build the project. Python, Django, SQLite, and Jinja2 make up the backend.Data was stored using Cloudinary, an online cloud service. Finally, black box and white box testing

were used to evaluate the website's functional, structural, and logical aspects.The Iterative Model of Software Development was used throughout the development process. The plan was to add functionality first, then design, test, and deploy it. Although this strategy requires more resources, with each iteration,the following iteration takes less time to build, and problems are quickly detected and corrected at the same time using this approach.

The feasibility study assisted us in identifying the major objectives, which were:

1. Different Educational Categories (Entrance, Recruitment, Academics, and Entertainment): Thefeasibility research assisted us in identifying the key objectives.
2. Within each Educational Category, there are various subcategories.
3. There will include Old Books, Question Papers, and Class Notes in each Subcategory.
4. Each user can add Class Notes, Old Books, or Question Papers, which will be added to the website afterbeing confirmed by System Administrators.
5. Cash on Delivery is an option for purchasing old books.
6. A chat-box for customers and sellers to communicate.
7. The User will only see resources that are relevant to their own university.

The product was tested in two ways: black box testing by users and white box testing by developers. Users were instructed to run the project and test all of its functions. The input was documented, and changes were made as needed; and White Box Testing, which involved creating and testing distinct test cases for each unit of source code. The desired output was predicted for each test condition. When the desired output was not found, a bug occurred. Each error was eliminated from the source code, and all of the units were finally integrated.

The Django Python Web Framework is used to build the project. It promotes quick development and simple, practical 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. With the use of HTML, CSS, and JavaScript, the project's front end has been made more user-friendly. The Python programming language was used to create the back end. Python allows us to create more functions usinglittle code lines. Python is widely used for web development due of its readability and efficiency.

Python is utilised in the development process in order to address security concerns. Python is safer than a number of popular programming languages. Django also aids businesses in improving the security of their websites and web applications by combating cross-site scripting (XSS), cross-site request forgery (CSRF), SQL injection, and clickjacking threats. By installing the web application behind HTTPS, the web application is made to securely exchange data with the webserver. The security issues have been addressed in order to prevent any unintentional attacks on the database and server.

II. LITERATURE SURVEY

Various websites and research articles have been created with the goal of sharing educational resources and emphasising their value. The following are a few of them:

1. Used Books Factory is an online marketplace for the sale of used books in a variety of areas.

2. Vioric-Torri, C., and Alexandrache, C. (2012): This study examines how educational technology affects students' learning styles and how to create and improve learning skills in future generations.

3. TutorialsPoint : The website offers tutorials on a variety of computer science and technology topics. Provides pdf notes for the same, as well as competitive exam assistance.

4. The Physics Classroom: For PDF files and tutorials on a variety of physics topics.

5. L. Kelly and K. Breault (2006): The study project's goal was to give the Australian Museum advice on how to best construct a website that satisfies the needs of students and teachers in primary and secondary schools across a variety of subject areas. The overall goal was to learn more about how kids and teachers use the internet and what they search for when they visit websites.

6. Aglasem: An online portal that offers prior year question papers and answer keys for a variety of competitive exams as well as semester papers from some universities.

7. BHU Student Club: This is an online social organisation that gives past semester papers from a few Banaras Hindu University courses.

After a quick review of the linked works, it was discovered that while all of these websites perform certain aspects of the project, none of them had all of the functionality.Furthermore, other than social media, there is no website where students can share their class notes. The following project was created with all of these drawbacks in mind.

III. PROPOSED APPROACH

The Software Development Life Cycle (SDL) is a term that refers to the process . The Software Creation Life Cycle (SDLC) is a method that specifies the many steps required in the development of software in order to create a high-quality product. The stages of the SDLC encompass the entire life cycle of software, from conception through retirement. The goal of the SDLC is to create a high-quality product that meets the needs of the customer. Requirement collecting, design, coding, testing, and maintenance are the phases of the SDLC. To supply the Product in a methodical manner, it is critical to stick to the phases.

B. Model of the SDLC :-

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. The Iterative model was used to create this project (Jalote, 2003).

A Project Control List (PCL) is created in this life cycle model based on current known needs. A PCL is a list that contains a set of tasks/functionalities that must be present in a particular system. If we come across a new requirement during the development process, we add it to our Project Control List.

A job from the specified PCL is chosen for website development, and planning, analysis, design, testing, and evaluation are carried out as indicated in Figure 1. We delete the relevant functionality from the Project Control List after it is implemented. Similarly, one job from PCL is picked at a time, implemented, and then deleted from PCL. This procedure repeats itself.

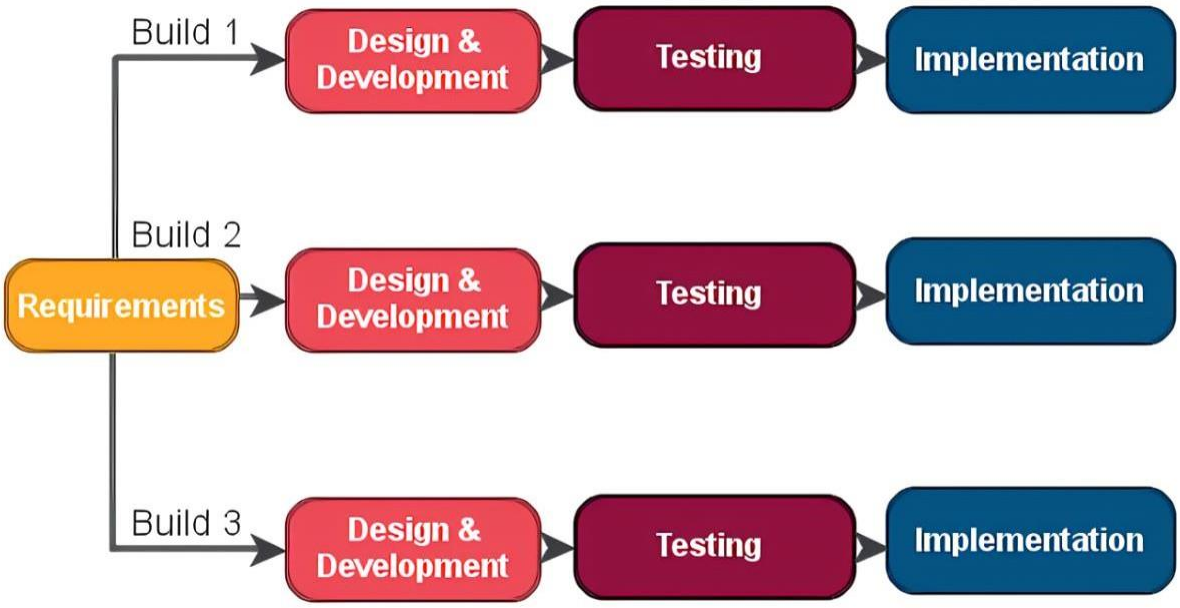

Fig. 1. Iterative Model

The management team can concentrate on risk management and plan for the next iteration after each iteration. Because a cycle only represents a small part of the whole software development process, it is often misunderstood. It's a lot easier to keep track of the development process now. Newer iterations are incrementally added to the Iterative model. Previous editions have been improved. Furthermore, in the event that a fresh iteration fundamentally destroys a system in one way or another. In a non- catastrophic way, a previous iteration can be swiftly and easily reverted , be deployed or "rolled back" with minimal losses, which is a win-win situation It's a godsend for post-release upkeep.

The initial run-through of all phases in the Iterative Model may take a long time, but each following iteration will be faster and faster, reducing the life cycle of each new iteration to a matter of days or evenhours in some situations.

C. Feasibility Analysis

A feasibility analysis is used to assess the viability of a concept, such as verifying that a project is legally, technically, and commercially feasible.The feasibility study was carried out as follows during the development of this project:

1) Project Specifications

In order to ensure the project's success, the following goals have been presented.

- User Registration.
- Login User Registration .
- Login as an administrator.
- Entrance, Recruitment, Academics, and Entertainment are examples of different educational categories.
- Within each Educational Category, there are several subcategories.
- Old Books, Question Papers, and Class Notes will be found in each Subcategory.
- Each user has their own account page.
- Each user has the ability to submit class notes, old books, and questions.
- Papers will be added on the website after they have been verified by Admin Users.
- If necessary, administrators can Add or Remove Resources.
- Cash on Delivery is an option for purchasing old books.
- A chat-box allowing customers and sellers to communicate.
- Only resources relevant to the User's own University will be displayed.
- A Search Bar That Moves.

During development, this requirement list was also used as the Project Control List.

Certain efficiency targets for the project to be developed were also proposed, and they are as follows:

- **Planned Approach** : The website's operation is meticulously planned and organised. The data willbe correctly saved in data stores, which will aid in both retrieval and storage of information.
- **Precision** : The proposed system will have a better level of accuracy. All activities would be completed correctly, and any information retrieved or stored would be accurate.
- **Reliability** : Because of the reasons described above, the suggested system will have a high level of reliability. The increased system reliability can be attributed to the fact that data is now properly stored.

- **No Redundancy** : The suggested system would take great care to ensure that no information is duplicated anywhere, whether in storage or elsewhere. This will ensure efficient storage space utilisation and data consistency.
- **Immediate retrieval of information** : The suggested system's major goal is to provide quick and efficient retrieval of information on users, orders, and products, among other things.
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IMPLEMENTATION

A). Applicable Technology

In current digital age, there are many different front-end and back-end technologies available. This project's technologies in the following sections are briefly discussed.

1) Technologies for the front end

a) HTML :

The acronym HTML stands for Hypertext Markup Language, and it is a programming language that allowsyou to create web pages.It is the most often used programming language for creating Web pages. The method by which Web pages are displayed is known as hypertext. (HTML documents) are connected through hyperlinks. As a result, The term "hypertext" refers to the information that can be found on a web page.

HTML stands for Hypertext Markup Language, which means you can use it to simply "mark-up" a text document with tags that tell a Web browser how to display it (Musciano & Kennedy,1996). HTML was created with the intention of specifying the structure of texts such as headings, paragraphs, lists, and so on in order to make scientific knowledge more easily shared between researchers. HTML is now commonly used to format web pages using the various tags available in the HTML language.

b) CSS :

Cascading Style Sheets (Powell, 2010) is an acronym for Cascading Style Sheets. CSS specifies how HTML elements should appear on a screen, in print, or in other media. CSS helps you save time and effort. It hasthe ability to control the layout of numerous web pages at the same time.

c) JQuery/JavaScript:

JavaScript (JS) is an interpreted high-level programming language. Curly-bracket syntax, dynamic typing, prototype-based object-orientation, and firstclass functions are all features of JavaScript. JavaScript is one of the most popular scripting languages, alongside HTML and CSS. E ssential World Wide Web technologies (Flanagan, 2006). JavaScript is a scripting language that allows you to create interactive web pages. A necessary component of web apps The vast majority of people It's used by a lot of websites, and all of the major web browsers support it . To run it, you'll need a JavaScript engine.

Event-driven, functional, and imperative (including object-oriented and prototype-based) approaches areall supported by JavaScript. It is critical to check the user-submitted form because it may contain incorrect information. As a result, validation is required to verify the user's identity. Because JavaScript allows for form validation on the client side, data processing is faster than with server-side validation.

d) Bootstrap :

Bootstrap is a framework for creating websites.Bootstrap (Shenoy & Sossou, 2014) is a free and opensource CSS framework for front-end web development that is responsive and mobile-first. It includes design templates for typography, forms, buttons, navigation, and other interface elements that are basedon CSS and (optionally) JavaScript. We must either install bootstrap on our machine or use a CDN to use it. The term "content delivery network" is an abbreviation for "content delivery network." A content delivery network (CDN) is a system of distributed servers that provide pages and other web material to users based on the user's geographic location, the webpage's origin, and the content delivery server.

2)Back-end technologies :

a)Python:

Python is a high-level, interpreted programming language that may be used for a variety of tasks. Pythonwas created by Guido van Rossum and initially released in 1991 (Kuhlman, 2011). Its design philosophy prioritises code readability and makes extensive use of whitespace. Its language elements and object- oriented approach are aimed at assisting programmers in writing clear, logical code for both small and large-scale projects. Python is utilised as the backend language on this website to code the database andall of the website's capabilities. Python 3.6 was applied in the creation of this project.

b) Django :

Django is a high-level Python Web framework that emphasises rapid development and clean, pragmatic design (Holovaty & Kaplan-Moss, 2008). It was built by experienced developers to take care of a lot of theheadaches 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 promotes component reusability and "pluggability," as well as less code, low coupling, rapid development, and the "don't repeat yourself" philosophy. Python is utilised 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 customised using admin models . Django 2.1.5 was utilised during the development process.

c) SQLite (SQLite)

SQLite is a C-language library that provides a SQL database engine that is tiny, fast, self-contained, high- reliability, and full-featured. 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.

d) Jinja2

Jinja2 is a Japanese word One of the most popular Python template engines is Jinja2 (Lokhande et al, 2015). It is based on Django's templating system, but adds an expressive language to provide template authors with extra tools . It introduces a sandboxed execution mode, which means that every component of the template execution is watched and explicitly whitelisted or blacklisted, depending on your preference. The following are some features of Jinja2:

- Cross-site scripting avoidance with a powerful automated HTML escaping technique.
- It is possible to utilise the same or comparable layout for all templates thanks to templateinheritance.
- Optional ahead-of-time compilation and configurable syntax, which means we can tweak Jinja2to better fit output formats like LaTeX or JavaScript.

B). Hardware and Software Requirements :

The completed product meets all of the functional and non-functional requirements. For the project to run on any device, the following requirements must be met.

1) System requirements :

2 GB RAM Intel(R) Core (TM) ie-5005U CPU @ 2.00GHz Processor: Intel(R) Core (TM) ie-5005U CPU @ 2.00GHz Processor: Intel(R) Core (TM) ie-5005

Type of system: 32-bit/64-bit operating system, x32 or x64 CPU Windows 7/8/10 is the operating system.

2) Software :

Front-end : HTML, CSS, Bootstrap, and JQuery

Backend : Django Local Access Link: localhost:8000 Backendhttps://www.shreic.com/home/global-access-link

C) Methodology :

Multiple steps are involved in the creation of the project. The following are the major steps:

1. Installing Python and adding it to the Windows path are the first steps.
2. Create a Virtual Environment (in Command Prompt, type the commands below).

- virtualenvwrapper-win pip install.
- workonenvironmentname.

- mkvirtualenvenvironmentname (any name).
- mkvirtualenvenvironmentname.

3. Django installation: pip install Django
4. Using the cd command, navigate to the Destination Place where you want the project to be saved.
5. Make the following project:

- startprojectsomeprojectname django-admin
- cd someprojectname .

6. Create a django-admin startappappname

- python manage.py makemigrations app for the project.
- python manage.py migrate.

7. Copy the Template Folder to the project folder created .
8. Start the server (localhost:8000)python manage.py runserver

Commands in brackets should be run from the Command Prompt. They are the actions that must be followed in order to set up a virtual environment and run a local server on the system where the project will be created. Any code editor can be used to write backend and frontend code (Sublime Text was used in this project). On the local server, you can view all of the modifications that have been made to the project. Cloudinary, an online cloud service, was used to store the data.

V. CONCLUSION

To summarise, the project was created using the correct Software Engineering process and the SDLC Iterative Model. After conducting a feasibility assessment for functions and non-functional needs, a Project Control List was established. Following that, the necessary schema and tables that were expected to be required in the development process were created, as well as linkages between each table . For this, a flow chart was created, which is depicted in the paper. Each user was given the task of running the project and testing all of its features. Following the testing, feedback and ideas were recorded, and changes were made as needed. The Django Framework's CSRF tags were used to tackle security issues, as well as putting the Web Application behind HTTPS . The System Development Model's approach can be utilised as a road map for efficiently developing comparable types of Web applications.

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 methodsto make transactions easier.

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