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Web-Ecosystem for Students with Special Needs

Udit Singh[1], Priyesh Pandey[2], Sahil Chaubey[3], Abhishek Kumar[4], Suresh Wati[5]
Department of Artificial Intelligence and Data Science Greater Noida Institute of Technology (Affiliated with AKTU, Lucknow)
Greater Noida, India

Abstract: India faces a significant challenges for student, children with disabilities in minor or major forms for any of the physical organs or mentally unstable children are considered to be specially-abled ones educational ecosystem, the needs of such an environment need to be catered according to the category of ailments that exist in the students and provisions need to be made in order to make them feel special, and cared for and set the right mindset while they grow. educational ecosystem, the needs of such an environment need to be catered according to the category of ailments that exist in the students. The aim of this problem statement solution is also to produce innovative solutions which may use digital and physical mediums together to make sure disabled persons are able to access and run these applications. Students with special needs often face various challenges in educational settings. It is important to recognize that these challenges can vary widely depending on the type and severity of the disability. A web ecosystem for students with special needs involves designing a platform that is inclusive, accessible, and tailored to meet the diverse needs of students with disabilities.

I. INTRODUCTION

A web ecosystem is a collection of interconnected components that includes a website, social media, digital marketing, and Software as a service (SaaS) tool. It has made up of three distinct regions of target audience engagement.

The web ecosystem designed for students with special needs aims to create an inclusive and accessible platform tailored to the diverse requirements of learners with disabilities. This digital environment is meticulously crafted to overcome the various challenges these students face in traditional educational settings. By incorporating advanced technologies, adaptive features, and a commitment to universal accessibility, this web ecosystem looks to empower students with special needs to thrive academically and socially. Multimodal learning resources, including text, audio, and video formats, are integrated to accommodate different learning styles and sensory needs. Compatibility with assistive technologies like screen readers and voice recognition software is ensured, creating a technologically inclusive environment.

II. RELATED WORK

A. "Accessibility in E-Learning Environments"

This study explores the challenges and solutions for ensuring accessibility in web-based learning environments for students with special needs.

B. "Impact of Inclusive Design on Special Education Websites"

Investigates how inclusive web design principles influence the user experience and educational outcomes for students with various special needs.

C. "Assistive Technologies in Online Education"

Examines the effectiveness of different assistive technologies in easing the participation of students with special needs in online educational platforms.

D. "Usability Evaluation of Educational Apps for Students with Disabilities"

Focuses on the usability aspects of educational applications, with a particular emphasis on apps catering to students with special needs.

E. "Adaptive Learning Platforms for Diverse Learners"

Explores the integration of adaptive learning technologies to tailor educational content to the unique needs of students with various disabilities.

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F. "User-Centred Design for Inclusive Educational Websites"
Discusses the importance of involving students with special needs in the design process and presents a user-centred approach to creating inclusive educational websites.

G. "Web Content Accessibility Guidelines (WCAG) Compliance in Educational Platforms"
Evaluates the adherence of educational websites to WCAG standards and its impact on the accessibility of online resources for students with special needs.

H. "Social Inclusion through Online Learning for Special Education Students"
Investigates the social aspects of online learning for students with special needs, emphasizing collaborative tools and virtual communities.

I. "Enhancing Multimodal Learning for Students with Disabilities"
Explores the integration of multiple modes of content delivery (text, audio, visual) to accommodate diverse learning styles and abilities.

J. "Evaluating the Impact of Gamification in Special Education Web Platforms"
Studies the effectiveness of incorporating gamified elements in web-based educational platforms for students with special needs to enhance engagement and learning outcomes. In the realm of design principles, the concept of Inclusive Design has gained prominence.

III. INTERNAL ARCHITECTURE

1) *Integrated Hosting Server:* Samarthya's Connect uses an inbuilt web hosting service that does allow the admin to take full control over the site and there would be no third parties for hosting, so the data safety is also increased with this feature. It also allows the admin to use this site in Production or Development. Also capable of heavy DB loads.
2) *Multiple Layers of Security Protection:* Our website is developed with Django and Rest-Framework because Security is always our primary choice. It can provide protection against (SPYWARES, XSS-ATTACK, SQL-INJECTION, CLICKJACK-ATTACK) also it comes with HTTPS protocol. (It allows scanning in Development server only)
3) *Real Time Monitoring:* This website includes an interactive dashboard where the diverse types of data analysis can be checked in public. Real time data visualization through Interactive Dashboard and Tabular Format representation also has an impressive filtration choice where you can Search the student data form the Big Data in a fraction of seconds.
4) *Connectivity:* In this website we have supplied on-site connection (from student to Govt/NGO) and email connection (from Govt/NGO to student), so the connection response is faster than other Government Windows.
5) *Web Framework:* Platform uses Django Rest Framework, Django for its scalable server-side deployment or backend Database. My SQL has been used to store the administrative information of user, posts credentials.

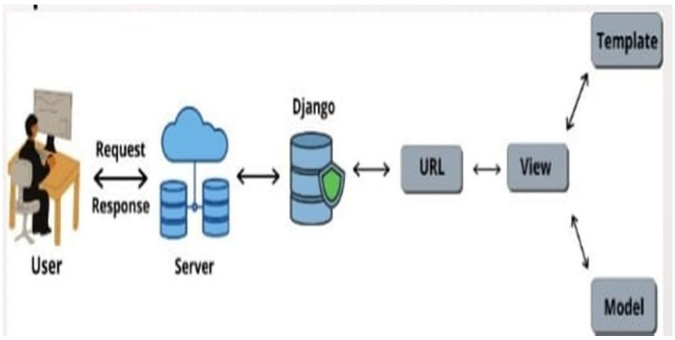


Fig1. Connectivity and Web Framework

6) *Authentication:* This website supports multiple user authentication and permissions which we have done with Django.
7) *Frontend Technology:* We have used variety of libraries and framework like Bootstrap include CSS, HTML, JAVASCRIPT, React JS.

8) *Data Visualisation:* We have represented the Data in format by using supportive. libraries like NumPy, Pandas, Matplotlib, Tailwind.
9) *API Integration:* We have used Django rest API for serializing the data from database, so the data transferring is possible.
10) *Hosting -Server:* This site can be conveniently get shifted to Nginx, Herok, AWS but it comes with NGROK integrated server.
11) *Security:* This website has protection against cross-site scripting (XSS attack), SQL injection, clickjacking, SSL attack, Host heading validation also it comes with templating engine that sanitizes malwares.
12) *Testing & Quality Assurance:* We have seriously evaluated every feature of this site so that there could be no bugs assurance keeping in mind that the feature should be error free.

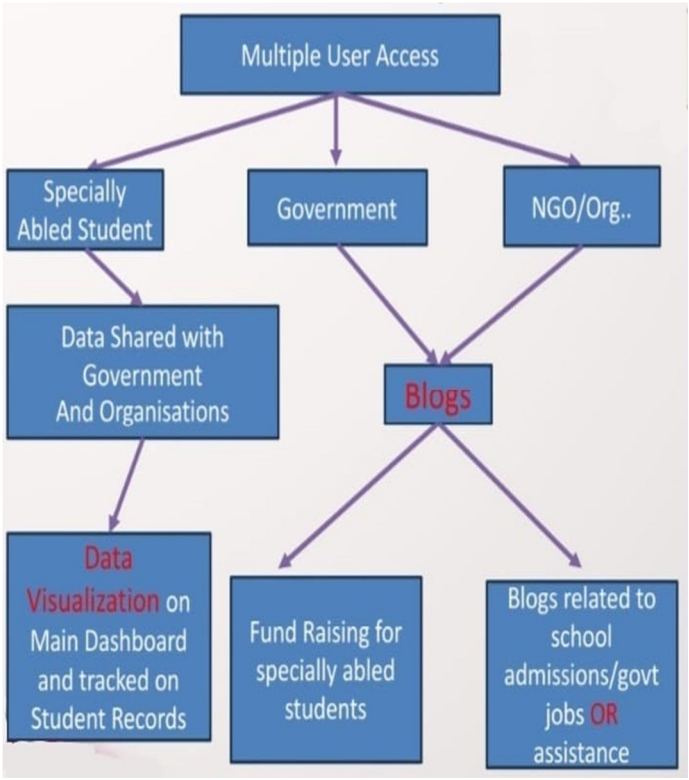


Fig2. Internal Architecture

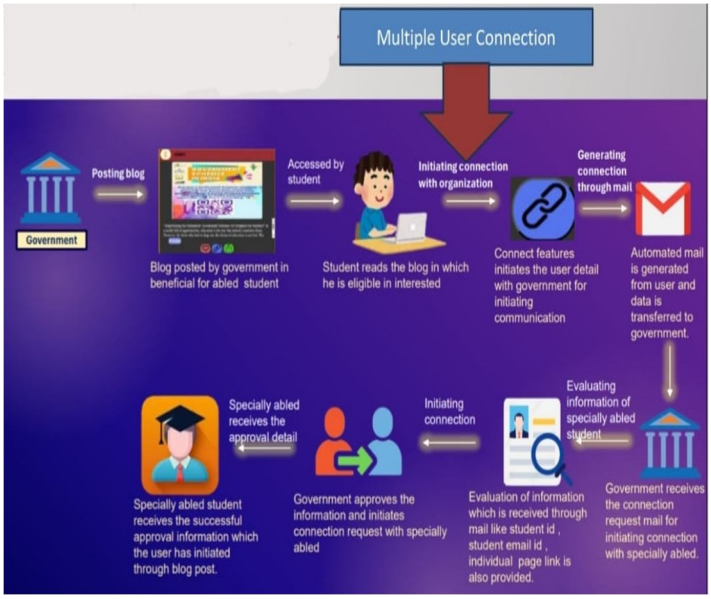


Fig3. User Interaction and Data Flow

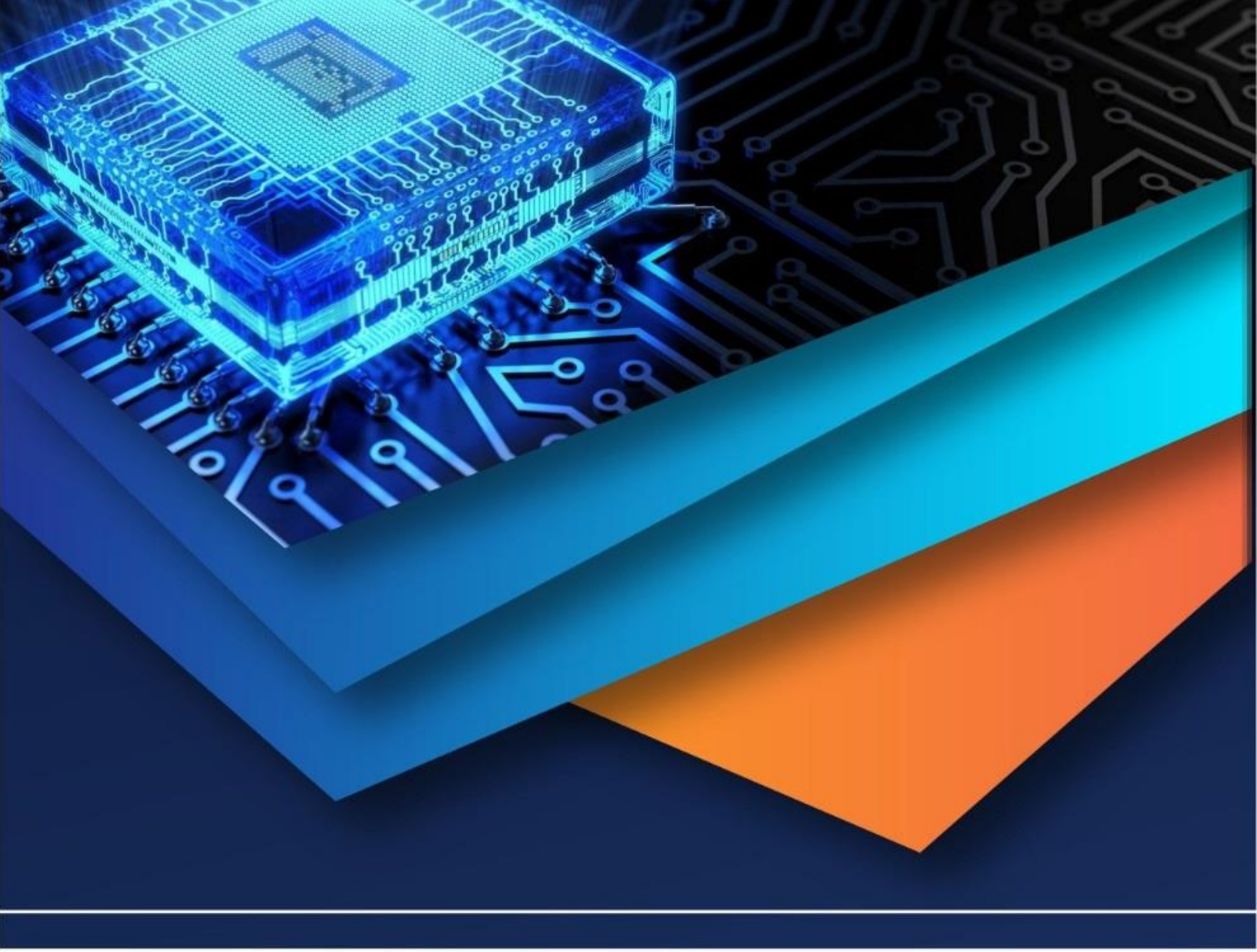
IV. CONCLUSION

In this paper, we solved problem related to:

1) *Information Dissemination:* Platforms supply a space where government schemes and support program which are beneficiary to students and spreading awareness.
2) *Student Interaction:* The supported cloud computing software and integrated server helps onsite face Cam calls, emails between student and organization.
3) *Data Driven Decision Making:* Interactive dashboard offers real time data and analysis on student dropout majorly divided into age wise, gender wise, school wise, caste wise, area wise further this data helps Govt/NGO'S for analysis and making decision.
4) *Real Time Support:* Student can seek guidance instantly which is crucial for Abled Student. Students can address problem Promptly.

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