

LEGALEASE

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Abstract:

In an era marked by technological advancements, the intersection of law and technology has brought about transformative changes in legal service delivery. "LegalEase" is a comprehensive software platform designed to facilitate access to legal information and streamline client-lawyer interactions within the Indian legal system, with a specific focus on Marathi-speaking users. The platform offers access to legal articles of the Indian constitution translated into Marathi, enhancing comprehension and accessibility. Providing a secure login for clients and lawyers, "LegalEase" allows clients to upload case documents and appoint their preferred lawyer for personalized representation. Lawyers can access assigned cases, engage with clients, and manage documents, promoting transparent and efficient legal proceedings. This streamlined system aims to bridge the gap between legal information accessibility and client-lawyer interactions, particularly benefiting Marathi-speaking users. Through its user-friendly interface and robust features for document management and client representation, "LegalEase" optimizes the legal service delivery process, enhancing the efficiency and effectiveness of legal proceedings in India.

Keywords—Artificial Intelligence, Legal research, articles, Indian Constitution, Transformative, Legal Service, Technology.

1. Introduction

In a time of rapid technological development, the nexus between law and technology has revolutionized the provision of legal services. This study explores the novel software platform "LegalEase," which was created to tackle the problems of client-attorney relations and legal accessibility in the Indian legal system, with a focus on Marathi-speaking users. This article explains how "LegalEase" expedites access to legal information, enables individualized client representation, and improves transparency in legal proceedings through a thorough analysis of its characteristics and implications. Through its ability to connect legal knowledge with user interactions, "LegalEase" becomes an indispensable instrument for enhancing the efficacy and efficiency of legal processes in India. The growth of the Web and the abundance of digital legal papers available has presented new issues for legal practitioners in India and many other nations. Legal professionals are now unable to manually locate pertinent data (such as previous cases, relevant acts or statutes, law reports, etc.) that might support an ongoing case [5]. The general public's ignorance about the law is a significant issue in India and many other nations. They have no choice except to seek legal assistance, which is unaffordable, even for minor matters. In addition, there are more and more ongoing legal disputes in Indian courts. The general public lacks legal knowledge, which makes them dependent on expensive, sometimes time-consuming legal counsel even for routine matters [5]. In this case, developing AI technologies that facilitate expediting India's legal decision-making process is essential. The idea's goal is to establish a legal aid program that both the Indian people and legal experts may use. Many tasks that are currently carried out by hand by the legal practitioner will be automated by the system, including locating relevant documents, summarizing legal text, predicting the outcome of arguments, and more. The system will try to assist the average person in legal problems and will be crucial in increasing the public's knowledge of the law. We envision a system that would include a substantial amount of information about Indian law. Both legal professionals and the general public will be able to use the Web-based legal assistance system to find answers to legal questions. We've developed a project that essentially serves as a comprehensive database for all Indian constitution acts and amendments. We've utilized Firebase as our database platform. For the user interface, we've built it using standard web technologies like HTML and CSS. The main functionality lies in the connectivity between the front end and the Firebase database. When a user logs in, they are presented with two options: they can either enter the system as a client or as a lawyer. Both types of users have access to the Indian Constitution acts and amendments. Additionally, we've incorporated a feature that allows these acts and amendments to be translated into Marathi, a regional language spoken widely in India. This means that whether the user selects English or Marathi, they can easily access and understand the content. This setup ensures accessibility and comprehension for both clients and lawyers using the system.

2. Literature Review:

Conventional legal research involves a thorough review of all bibliographical sources, such as case laws, pertinent statutes, and court records. Certain industry jargon, such as "artificial intelligence" and "machine learning," has common usage among experts and has broad meanings. The content that follows will therefore provide direction and a clear path.

a. The evolution of legal research methodologies:

The way law research was done in the past appeared to be outdated, with people physically going through cases, statutes, and precedents to find relevant cases. It was a drawn-out project with often erroneous or subpar outcomes. Many new legal research tools that were created after this time, like to online databases and search engines, had an impact on accessibility but not technique (Baker & Smith, 2023).

b. Emergence of AI & ML in legal research:

ML and AI The definition of research has undergone a significant change as a result of integration with legal research. Natural language processing (NLP) and machine learning algorithms are used by AI-based research platforms, like ROSS and LexisNexis, to read documents, extract information from them, and give legal entities individualized insights. Such platforms provide legal practitioners with a smooth path of research, allowing them to prioritise higher-level issues, case strategy, and client counselling (Carlton, 2021). [3] The deep learning methods for legal frameworks that have been published in the Journal of AI in Law, the IEEE International Conference on Big Data, the International Conference on AI Applications and Innovations, the Conference on Knowledge Discovery and Data Mining, and the Journal of Machine Learning are summarized here. We searched for methods that combine legal system keywords with deep learning, artificial intelligence, neural networks, document classification, and legal data. The majority of the publications we reviewed were released between 2017 and 2019.[2] From this paper, we discovered,

1. Legal search data:

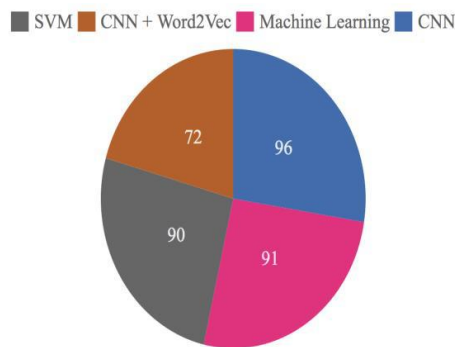
Document embeddings and deep learning are used to retrieve legal documents, as explained by Sugathadesa, K. et al. Three main models were developed by the authors: the first was vector space representations of the legal system using the Node2Vec algorithm, the second was based on sentence similarity, and the third was vector space. Neural networks were used to implement the three models. The approach might be used to develop retrieval data in another legal arena, according to the authors, who also found that group models showed higher levels of accuracy [2].

2. Legal document analysis:

A multi-task learning strategy for the Multimodal algorithm was put out by Elnaggar, A., et al. The technique was developed as a single deep learning model that was used for a variety of legal tasks. Additionally, the authors proposed that this is a useful approach to dealing with the legal system's data scarcity problems. Another implementation, developed by Wang, Y., is a unique model known as

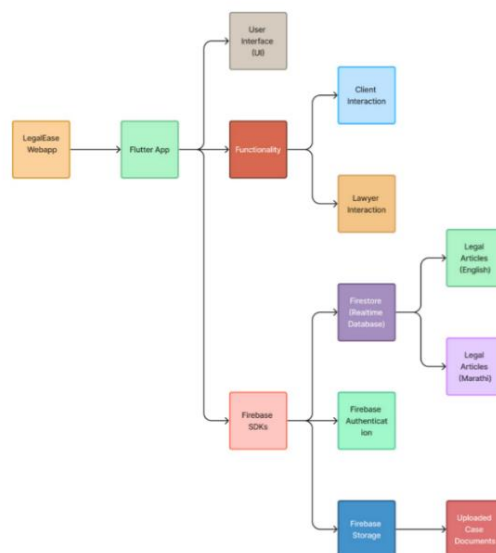
Word2sent that uses unsupervised machine learning to identify patterns in legal phrases. A more thorough approach in between sentences is the advantage here.

Figure 1: Deep Learning techniques for data classification



Even if we can come up with excellent ideas in this day of quick prototyping, if they take too much work, they might not always be useful. Often, the back end is the bottleneck; a lot of factors don't apply to server-side code because of insufficient experience or time. A backend-as-a-service (BaaS) technology called Firebase offers mobile apps a real-time database. With Google Firebase, developers may construct Web, iOS, and Android applications. Google supports this platform. A range of tools are available from Firebase to manage data, create marketing campaigns, and address app issues. Data is stored as JSON in the cloud-hosted Firebase Realtime Database. Real-time synchronization of data [1]. When we build cross-platform applications with our iOS and JavaScript SDKs, all of our clients use the same real-time database instance and receive automatic updates with the most recent data. Our users are able to work together thanks to the Realtime database. Although it is more recent, Cloud Firestore does not take the place of Firebase Real-time Database. A scalable and adaptable NoSQL cloud database is called Cloud Firestore. It is employed in server and client programming for data synchronization and storage. It is used with Firebase and Google Cloud Platform for server, browser, and mobile development. [1].

Figure 2: Architecture Diagram



3. Database

3.1 Backend As a Service:

Developers need to be familiar with the two main words used in mobile application development: frontend and backend. The backend, which among other things stores and safeguards data, is the most crucial component in developing mobile applications. The backend of the app stores and sorts data so that the user only sees relevant information. It works similarly to a server for mobile apps. Software as a backend (SaaS) With the "service" cloud service paradigm, developers just need to design and manage the front end of web or mobile applications—all backend work is outsourced. Software that has already been created for server-based tasks like database management and user authentication is offered by BaaS providers. Cloud storage and hosting, as well as push notifications and remote upgrades (for mobile apps), are accessible.

3.2 Firebase:

A) Introduction to Firebase:

Along with real-time database functionality, Firebase offers Backend-as-a-Service (BaaS). You can keep a list of items in it. The Google-backed application development tool Google Firebase lets programmers make apps for iOS, Android, and the Web. Google's cloud services, including instant messaging, user authentication, real-time databases, storage, hosting, and more, are gathered under one umbrella called Firebase. [1] Real-time database, authentication, cloud storage, cloud functionalities, and more are all offered by Firebase. Real-time data in the database is enabled by Firebase. Data transport to and from the database is made easy via Firebase. A backend for Web, iOS, and Android applications is provided by Firebase. A secure connection to the Firebase server is required for configuring Firebase applications. Firebase offers a control panel with basic settings. It provides a range of helpful

B) Ease of using Firebase:

A web application development platform called Firebase was made by Google. It lets you create the full application without requiring any server-side code on the front end. Furthermore, it allows you to configure server-side logic using Firebase Functions in the event that you need to respond to specific events (such the generation of files or data, login requests, or https requests) in order to handle data after it has been produced or to send emails or push alerts. Making a Firebase project from scratch or adding one to an already-existing project is easy. Since it allows for real-time database connections, many users can view updates to the data as they are made or changed.

C) Services of Firebase:

a) Analytics: This function aids in the application developer's comprehension of user behavior within his program. The SDK lets you obtain custom data and records events and properties automatically. The most popular feature in your program and the person who is most active are both shown on the dashboard. You also get summarized data from it.[1] intended for applications, both user- and event-centric, links across Firebase, Free and Infinite

b) Development: Authentication with Firebase: User authentication is currently the most crucial prerequisite for Android applications. Creating the code for user authentication is a significant work, but it can be completed fast and effectively with Firebase. User authentication is vital. A user's identity is recognized by some applications. The application securely stores data to the cloud by utilizing user identity. Authentication using email, Google, Facebook, mobile phone number, and other means is possible with Firebase Authentication. You must first get the user's authentication credentials in order to authenticate your app. The credential may take the form of a password, phone number, etc. The credentials are sent to the Firebase Authentication SDK after being received. After confirming the user's credentials, the Firebase backend will react appropriately.

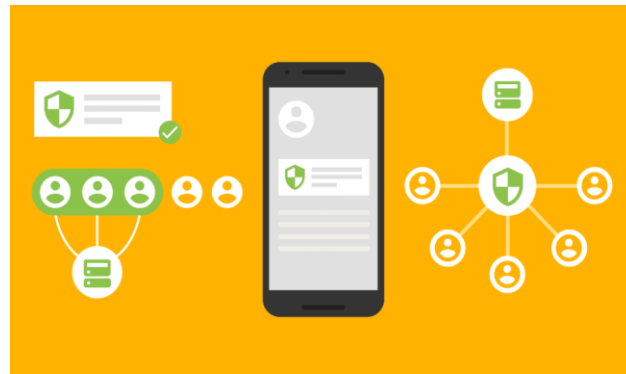
Figure 3: Services Of Firebase



4. Features of Firebase:

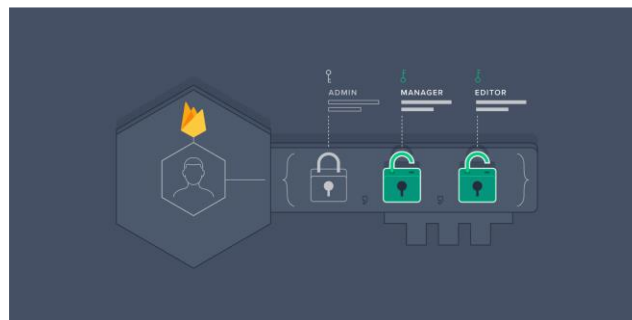
A. The Real-time Database Riddle:

Firestore's crown jewel is none other than its real-time database, a treasure trove for developers seeking to craft applications with an alchemical blend of simplicity and collaboration. This enigmatic database boasts the Live Sync enchantment, weaving a spell that instantly transmutes data updates across all linked devices. This mystical power is a boon for applications thirsting for real-time revelations, breathing life into interactive spells, or collaborative incantations.

Figure 4: The Real-time database Riddle

B. Authentication Magic Unveiled:

Firestore unveils a simple yet enigmatic authentication incantation that empowers developers to seamlessly infuse their creations with the essence of user identity. It beckons forth a legion of authentication deities, from the humble email/password guardians to the celestial social login deities and the single sign-on (SSO) titans. This mystical confluence simplifies the intricate art of user management and fortifies the citadel's defences.

Fig 5: Authentication Magic Unveiled

C. Hosting: A Fortress for Digital Treasures:

Firestore Hosting stands as an impenetrable fortress, a bastion of reliability and stability where static and dynamic content can take refuge. With features like continuous deployment and the ethereal content delivery network (CDN) integration, it ensures swift and scalable web hosting, making it an exquisite choice for the grand spectacle of web application deployment.

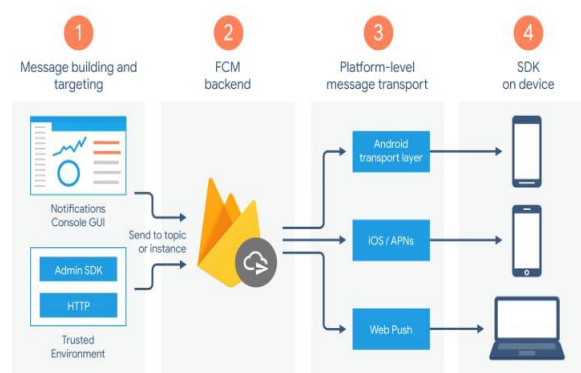
D. The Shadowy Constraints:

But even in the land of enchantments, shadows lurk. Firestore, as all-intone as it may seem, may not don the mantle of wisdom for complex, idiosyncratic creations yearning for bespoke backend architectures. As the spell of scale is cast, Firestore's pricing incantations might exact a steep toll, potentially dimming its lustre in the pantheon of economical solutions.

5. The Grand Convergence

Firestore stands as a powerful enchanter, beckoning developers to partake in its user-friendly realm for modern web and mobile applications. Its real-time wizardry, authentication incantations, and hosting relics are alluring gems in its arcane arsenal. Yet, like all spells, it must be wielded judiciously, for it may not be the elixir for all quests, especially those demanding the bespoke touch or a thrifty coin purse. [9]. The choice between Firestore and the traditional grimoires of backend development is a fateful decision, hinging on the specific needs of each quest. Developers must carefully peruse their tomes, considering their needs, talents, and treasure chests to discern which magic best aligns with their quest. In the ever-advancing saga of backend conjuration, Firestore emerges as a testament to the potency of modern integration. It empowers developers to craft more efficient spells and focus their energies on delivering a superior patron experience [9].

Figure 6: Firestore Database



6. Indian Constitution: An Analysis of the Fundamental Rights and the Directive Principles:

A country's Constitution establishes the fundamental structure of the political system that will govern its citizens. It creates the primary branches of the state legislature, executive branch, and judicial branch, outlines their roles and authority, and governs how they interact with the public and one another. [6]

Objectives:

- Analyse the Indian Constitution's provisions that promote and protect human rights.
- Examine various rights enshrined in the Constitution [6].

The Indian Constitution is the ultimate law that governs the Republic of India. It was enacted on January 26, 1950. It lays out fundamental rights, guiding principles, and the duties of citizens in addition to the organization, operations, authority, and responsibilities of governmental organizations. India's Constitution: The original document that took effect on January 26, 1950. Amendments: The Constitution has been amended numerous times over the years to account for changes, address new issues, and refine existing provisions. Some significant amendments include:

- a) The First Amendment (1951) established reasonable restrictions on freedom of expression to maintain public order and dignity.
- b) The Forty-Second Amendment (1976), also known as the "mini-Constitution," made significant changes to the Preamble, Fundamental Rights, and State Policy Directive Principles.
- c) The Ninety-Third Amendment (2005) allows the government to provide reservations for socially and educationally disadvantaged groups in private educational institutions, including minority schools.
- d) One Hundred and First Amendments (2016): Introduced the Goods and Services Tax (GST) to create a unified taxation system in India.

1. Rather than being a particular law or amendment, the Basic Structure Doctrine is a judicial principle that was created by the Supreme Court of India. It holds that certain aspects of the Constitution are beyond Parliament's purview and cannot be amended through its amending powers. These include the concepts of federalism, secularism, democracy, and the separation of powers.

2. Fundamental Rights: Part III of the Constitution guarantees rights such as equality, freedom of speech and expression, defence against exploitation, religious liberty, rights to culture and education, and availability of constitutional remedies.

3. The State's policies and legislative choices are guided by the Directive Principles of State Policy, which are delineated in Part IV of the Constitution. They include principles of social justice, economic welfare, and international relations.

4 Amendment Process: The process for modifying the Constitution is outlined in Article 368. A law must be introduced in either house of parliament, passed by both chambers with the support of at least half of the state legislatures, and then approved by a two-thirds majority of the members present and voting on the measure.

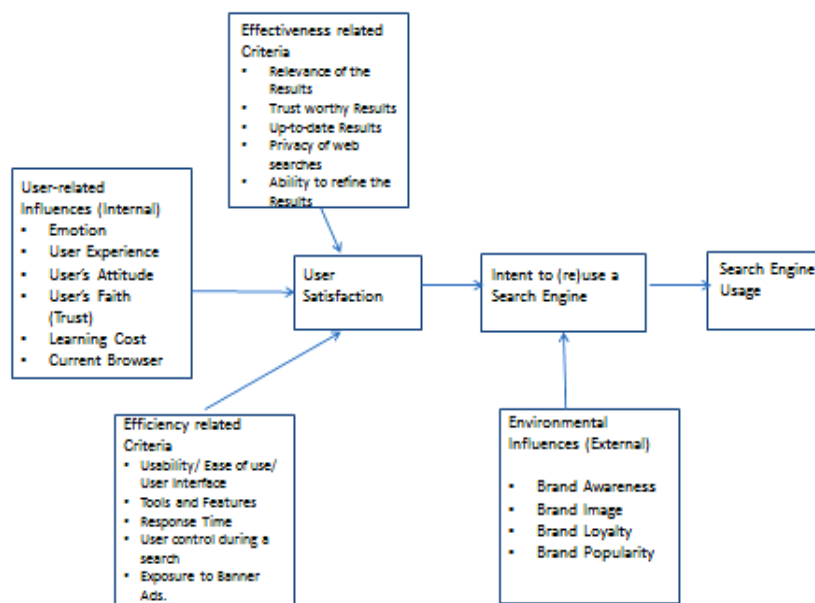
Table 1: Legal Documentation Used

Sr. no.	Legal content	Number of Content	Languages
1	Articles	448	English / Marathi
2	Amendments	106	English / Marathi
3	IPC Sections	511	English / Marathi
4	Schedules	12	English / Marathi

7. Search Engine:

The success of the Web is largely due to search engines, which make it possible for any user to locate pertinent information rapidly. On the other hand, the Semantic Web has emerged as a solution to the problems with existing search engines. In the context of the Semantic Web, search engines should be able to find relevant Web material more rapidly and efficiently. In this study, we presented the architecture of a semantic search engine and demonstrated how the information retrieval issue might be tackled with the help of a semantic search engine's essential elements. Then, to guarantee the effective retrieval of information resources, an enhanced method built upon the TFIDF algorithm was put out. [14]. The two most popular things that people do on the Internet are use email services and conduct targeted information searches. One of the most popular methods for consumers to find various kinds of information on the Internet is through search engines. [14] Users can find any information on the web or even outside of it with the assistance of one of the many search engines that are available online. These comprise other search engines, Medline Plus, Sapo Sau 'de, and Web MD, as well as general search engines like Bing, Google, Sapo, and Yahoo! (Lopes & Ribeiro, 2011). Search engines' absence from the Internet would cause web-based information retrieval systems to malfunction.

Figure 7: Concept model for evaluating a search engine



A. User Experience of Search Engines: Creating a great search engine user experience is essential to getting people to use and re-use the system. User experience is described as the act of engaging in search applications utilizing various search tools. It relates to the total happiness and experience that users have with a product/system, such as a search engine. When users have had a negative experience with a search engine, they are more likely to avoid using it again.

B. User Experience of Web/Computer: User experiences are divided into three categories: knowledge of computer programs (like Microsoft Office), knowledge of information retrieval methods (like Online Public Access Catalogues), and knowledge of Internet search engines (Su, 2003b). According to Liaw and Huang (2003), user experience with the Internet and computers has a significant impact on user

perceptions of using search engines. An experienced search engine user will understand how to use the search engine better than a new user.

C. Faith (Trust) of a Search Engine: Search engine usage behavior is significantly influenced by one's level of trust in a search engine (Rieger 2009). For instance, users' search behavior is driven by their confidence in Google's capacity to rank results according to their actual relevance to their query, as demonstrated by Pan et al.'s (2007) laboratory research. Thus, trust is the conviction that a search engine can find and provide results that are truly relevant to a query.

8. Working of Search Engines:

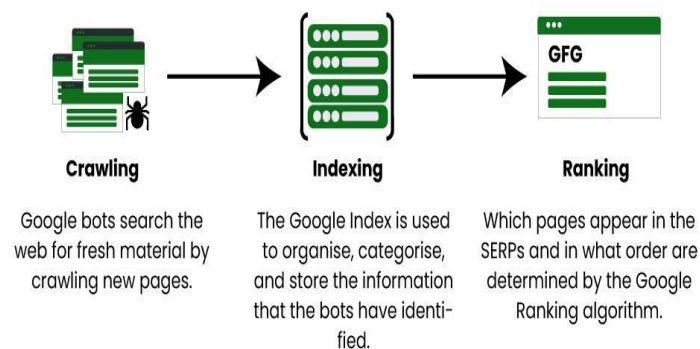
Every search engine experiences three phases:

stage 1: Crawling

stage 2: Indexing

Step 3: Indexing and Locating

Figure 8: Working on Search Engine



Stage 1: Crawling is the first stage, which entails scanning the sites and gathering information about everything on them, including the page title, keywords, layout, and links to other pages. This work is done by specialized software robots known as "spiders" or "crawlers". These robots often begin their searches with the most widely visited websites and servers. Which path these "crawlers" take is determined in large part by the connection structure.

Stage 2: Indexing happens after all of the data has been processed and part of it has been kept in sizable storage facilities. We can relate to one other because we each have a large book collection. The method of going through everything is called crawling, and the process of making a list of them, together with their authors and other pertinent details, is called indexing. The view is small-scale in this case.

Stage 3: Classification and Obtaining Answering machines are search engines. The search engines mine their databases for the most pertinent results when we perform an online search. Additionally, the results are ranked based on how well-known the websites are. These search engines prioritize relevance and popularity in order to provide satisfactory performance. Ranking algorithms differ between search engines. But this gave rise to a practice called "keyword stuffing," where sites are essentially full of gibberish as long as the term appeared.

9. Flutter

2018 saw the official release of Flutter, a mobile SDK and UI tool developed by Google and built on the Dart programming language. Delivering applications that closely resemble native programs in terms of functionality, appearance, and feel is the developers' main objective. Widgets are the main concept in Flutter's code. Every Flutter component is referred to as a widget. This could refer to a box or text, which is known as a widget. One notable feature of the widgets is that they are designed by Flutter developers to appear native, and developers can fully customise them to their liking. Flutter uses a material components library by default, allowing developers to use components that are ready from the start, which is a concept that web technology frequently works with. A feature of Flutter development known as "hot reloading" allows you to observe changes more quickly by rebuilding the structure once modifications are fed into the Dart Virtual Machine. A cross-platform framework called Flutter is intended for creating mobile apps with optimal performance. 2016 saw the public release of Flutter by Google. Applications for Flutter are compatible with Fuschia in addition to iOS and Android. The application-level foundation for its upcoming operating system is called Flutter. Flutter is distinct in that it doesn't use web views; instead, it uses the OEM widgets on the device [15].

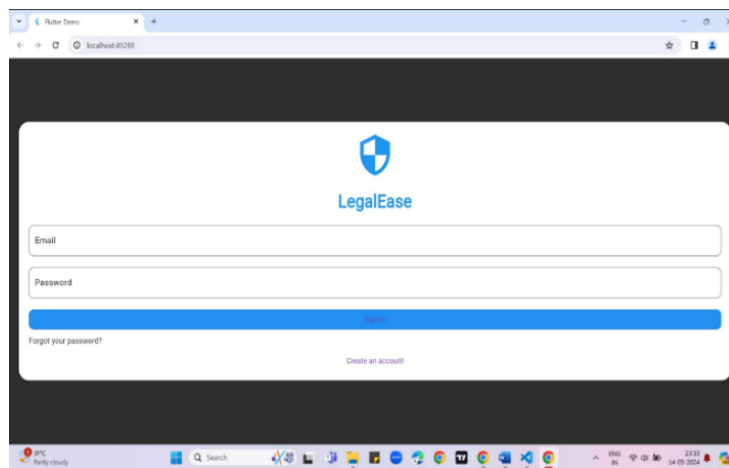
Flutter renders each view component separately using a powerful rendering engine. Because of this, you can make apps that are just as efficient as native ones. Given the architecture, the engine's C or C++ code is compiled with Android's NDK and LLVM for iOS, respectively, and the Dart code is compiled into native code.[15] Flutter uses AOT to compile the developer's Dart code to native when it runs on Android. These are loaded into a runner and packaged as an APK together with the x86 libraries created during the compilation of the dart code. Though the Dart code is built into an ARM library before being installed as a runner and packaged as an .ipa file, Flutter functions similarly to the iOS system. According to the developers' explanation on their website, Flutter implies that the entire procedure is comparable to how gaming engines operate.

10. Results:

A). Login Page:

Our project features a sleek and intuitive login page designed using Flutter, a powerful UI toolkit for building natively compiled web applications. The login page serves as the gateway for users to securely access our application, providing a seamless and user-friendly authentication experience.

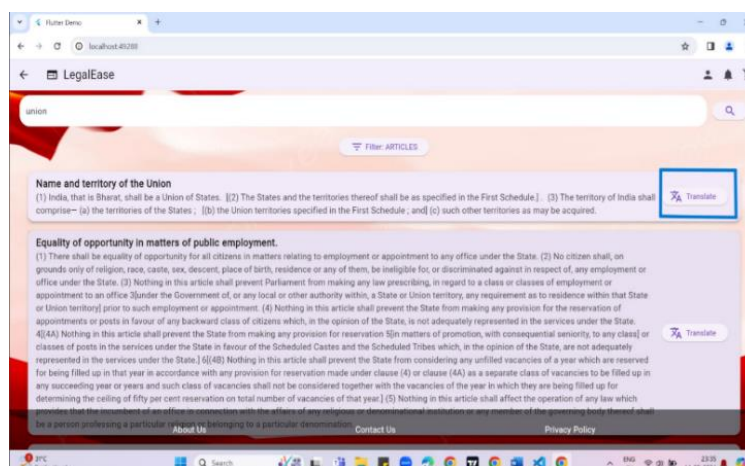
Figure 9: Login Page



B). Search content Appeared:

Our project features an interactive search results page built using Flutter, a versatile UI toolkit renowned for its ability to create high-performance applications across various platforms. The search results page serves as a dynamic interface where users can explore and discover relevant information tailored to their search queries in real time.

Figure 10: Search Content



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