Chatbot Enabled Smart Job Application Portal

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Abstract:

We live in a prosperous era where new technology is introduced to the world every day, changing and influencing the way we live. In this time of Industrial automation, AI Chatbot has become a commonly used application by almost every company worldwide to optimize growth and efficiency. As we are in the world of technology and digitalization, we need all of our services to be done quickly and digitally. In this paper, a chatbot enabled smart job application portal was designed and implemented using modern technologies and tools in which basically students and job aspirants will get all required information about all job opportunities available on a single portal. This smart job application portal focuses on ensuring a quick process of scholarships to needy students. It provides digital solutions that not only save time, but also have a good user-friendly interface and sends notifications using SMS service and emails on the progress of applications in a timely and transparent manner.

1. Introduction

As a densely populated nation, India annually produces more than 6 crore graduates from a wide range of socioeconomic and educational backgrounds. Students during or after graduation eventually start looking for good job opportunities based on their skills.

Job Search Portal is a web application, which serves jobseekers to find available job vacancies and Employers to identify eligible job seekers with the prospect of selecting the most qualified candidates. Job search portals best serve this purpose. E-recruitment has become the standard means for employers and job seekers to meet their respective objectives.

Job search portal stands as an effective means for Employers to outline the job vacancies, responsibilities and qualifications to attract jobseekers. Using the portal jobseekers can extensively search for jobs in companies, organizations and regions they may otherwise have not learnt

Vol. 29

No. 6

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2. Problem Statement

To design a web portal where several National and International scholarships that would be based on study field, merit, income etc. are shown up. This will be a real time data management which wouldbe updated with the latest scholarships that are being offered.

3. Abstract

The purpose of Online Smart Job Application portal is to automate the existing manual system by the help of computerized equipment's and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. The required hardware and software are easily available and easy to work with.

Online Job Portal, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on their records. Thus, it will help organization in better utilization of resources. The organization can maintain computerized records without redundant entries.

The aim is to automate its existing manual system by the help of computerized equipment and full-fledged computer software, fulfilling their requirements so that their valuable data/information can be stored for a longer period. Basically the project describes how to manage for good performance and good services for the clients.

4. Methodology

Problems of existing system

The existing system for job recruitment includes traditional methods like Employment agencies, advertising through newspapers, televisions and radios, college fairs etc., which are too slow and stressful. With the advancement of internet, jobseekers rely on the online job portals, which makes the job search efficient. Again, most of these are limited to the web/desktop applications, which requires jobseekers to have a laptop or desktop connected to internet and is not handy.

Disadvantages: -
• Time Consuming
• Stressful
• Challenging

Analysis And Features Of Proposed System

Job Search Portal is a Java-based web application as well as Android application that provides functionalities of e-recruitment on desktop and on portable devices like Android based smart phones/tablets. Both applications do not require internet to perform the desired functionalities.

Vol. 29

No. 6

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Job Search Portal is developed to provide an effective means for the employers to post job openings with required qualification to have a better penetration into the job market and jobseekers to find out the information regarding the current openings in the organization. In addition, Employers can view the reviews provided by the applicants to make necessary improvements in their system if needed. Job search portal is both web based as well as an android application providing flexibility for the users.

Components of the web portal:

a)   Scraper:

Web scraping is a technique for grabbing data from the WWW (World Wide Web) and saving it in a database or file system for later retrieval or analysis. It's also known as web extraction or web harvesting. Web data is routinely retrieved from websites using the HTTP (Hypertext Transfer Protocol) or a web browser.

Portal will have an automated scraper which will scrape scholarships from various sources at scheduled time intervals and they will be stored in an Apache KAFKA queue. Scholarships can be added to the database both ways by the scraper as well as the admin which will be in the JSON format.

b)   Cron Jobs:

A Cron job is a Linux command that is used to schedule tasks to be executed later. It is typically used for scheduling a task that is carried out on a regular basis, like sending a message each morning.

You might need to set up Cron jobs in order for some scripts, including Drupal and WHMCS, to carry out particular tasks.

Cron jobs will remove the expired scholarships from the database as well as trigger email notification to the user when a new scholarship is added to the database.

a)   Job Service:

Job service includes:

● Creating scholarships in bulk
● Performing CRUD operations in database
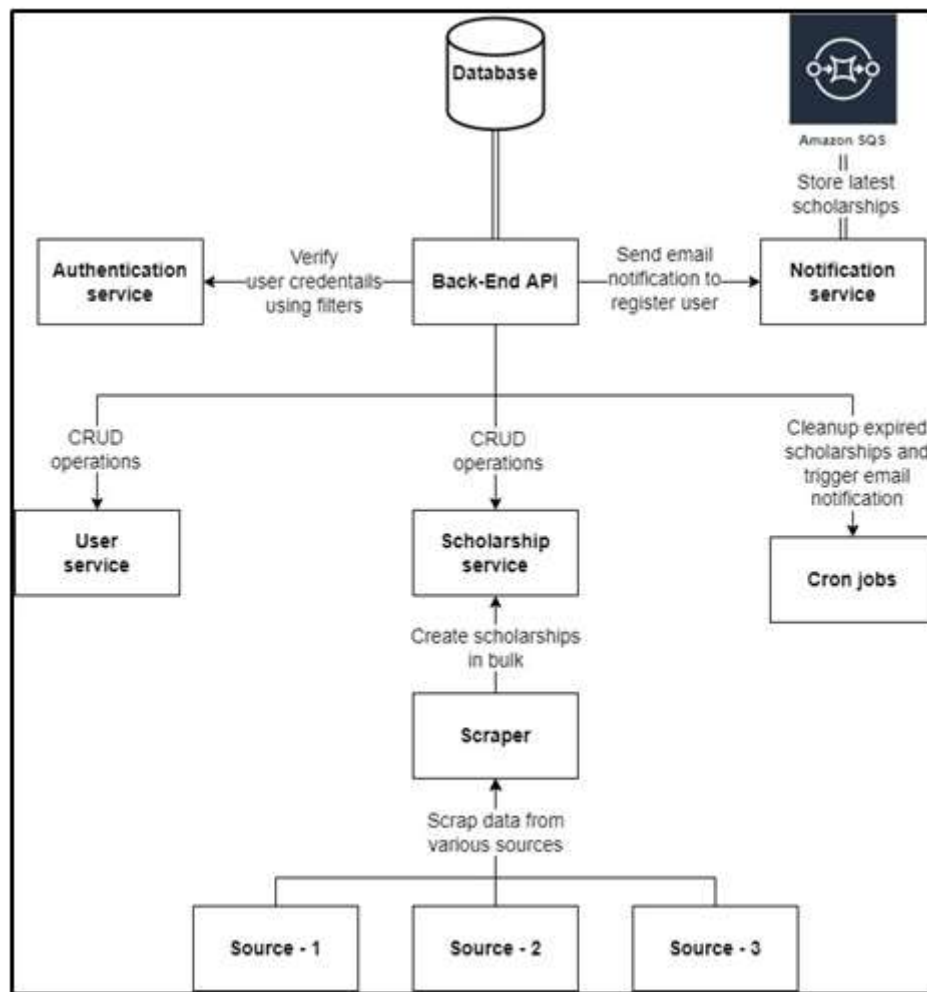● Auto-removal of expired scholarships.

Vol. 29

No. 6

计算机集成制造系统

Computer Integrated Manufacturing Systems

ISSN

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Fig. 1 Architecture of proposed portal

b) Notification service:

Scraper will automatically scrape all the latest scholarships from the various sources and will add them to the database and admin also has the authority to add scholarships in the bulk. There are the two sources from which data can be added to the database. Using the notification service, the user will be notified every time a new scholarship is added to the database.

c) Authentication Service:

JSON web tokens are used to authenticate and verify user credentials.

JSON Web Token (JWT) (RFC 7519) is an open imagine the world without JavaScript. It is supported by all major browsers like google, Firefox, Microsoft Edge. JS has become an essential part of Front-end web development in the present era, giving developers with tried-and-true tools for creating scalable, interactive web applications.

Vol. 29

No. 6

计算机集成制造系统

Computer Integrated Manufacturing Systems

ISSN

1006-5911

d)   Java:

Java is among the most extensively used and popular programming languages. It is an Object - Oriented Programming Language whose source code is first compiled into bytecode (machine- independent code). The byte code is then executed on the Java Virtual Machine (JVM), independent of the embedded system.

e)   Spring Boot:

The Spring Framework is the foundation for the Spring Boot project. It provides a faster and easier method to install, set up, and run both basic and web-based programs. It is a Spring module that provides access to the RAD (Rapid Application Development) capabilities to the Spring Framework. It is used to build standalone Spring-based apps that may be executed since it requires very little Spring settings.

f)   Java Mail API:

An API used to create, write, and read electronic communications is called Java Mail (emails). The Java Mail API offers a framework for sending and receiving emails that is agnostic of platform and protocol.

g)   MongoDB:

MongoDB is a document database which is stored as BSON under the hood but is represented as JSON. A document in MongoDB is a data structure made up of key value pairs, identical to the format of JSON objects.

h)   Amazon SQS:

Amazon SQS (Simple Queue Service) allows you to transmit, store, and receive messages across software components at any quantity without losing messages or necessitating the availability of other services.

Standard that defines a concise and independent way for securely exchanging data between parties as a JSON object. Because this information is digitally signed, it can be verified and trusted. JWTs can be signed using a public/private key combination using RSA or ECDSA, or with a secret key pair (with the HMAC algorithm).

i)   Database:

Database will store all the scholarship data scraped from different sources. A NoSQL (MongoDB) database has been used which stores the data as key-value pairs. Scholarships has been stored in JSON format using the URL of the scholarships as the key.

5. Modules Description

The framework of the project is kept basic. The modules or libraries used in this project are highlighted underneath:

Vol. 29

No. 6

计算机集成制造系统

Computer Integrated Manufacturing Systems

ISSN

1006-5911

a) HTML:

Html (Hypertext Markup Language). It is the foundation of the websites. The word "hypertext" refers to hyperlinks that connect online pages, either inside a single page or across many sites. Links are an important part of the Internet. It is responsible for designing the web page by displaying text, images, forms, tables etc. One can specify the layout and structure of the webpage by using the html tags.

b) CSS:

The Cascading Style Sheets or CSS is responsible for the web page appearance or styling. It is not a markup language rather it is a style sheet language. It is used to fastidiously style html or xml elements. CSS was invented to solve the problem of html tables, making it significantly easier to style our website.

c) JAVASCRIPT (JS):

JS is the language that powers the web. It is the most well-known Scripting language. Brendan Eich created the first ever Live Script (later named JavaScript) at Netscape and today we cannot imagine the world without JavaScript. It is supported by all major browsers like google,Firefox, Microsoft Edge. JS has become an essential part of Front-end web development in the present era, giving developers with tried-and-true tools for creating scalable, interactive web applications.

d) Heroku:

Heroku is a cloud - based platform that integrates computation, information, and workflows with a greater developer experience. Heroku Enterprise provides the same fantastic developer experience in addition to enterprise-level governance, collaboration, and compliance.

The platform offers corporate teams a quickest route to providing dependable consumer experiences at scale. It improved confidentiality in an internet runtime environment, seamless scalability to suit enterprise demand, and security. simpler complies with PCI, SOC, and other standards Automated, CI/CD workflows for the best team cooperation.

e) Nuxt.js:

Nuxt is the Hybrid Vue Front-end Framework. For the creation of cutting-edge and effective web apps that can be installed on any platform supporting JavaScript, Nuxt is an open-source framework available under the MIT license. Vue.js is the view engine used by Nuxt. Component auto-imports and file-based routing are two capabilities that Nuxt adds to the frontend framework Vue. Users of Nuxt can now access new patterns thanks to the integration of Vue 3, the newest major release of Vue.

Vol. 29

No. 6

计算机集成制造系统

Computer Integrated Manufacturing Systems

ISSN

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f)   Vuetify:

A Vue UI library called Vuetify features exquisitely made Material Components. Its objective is to give developers the resources they need to create rich and interesting user interfaces. A modern framework for creating user interfaces is called Vue.

Vue, in contrast to other monolithic frameworks, is created from the ground up to be gradually adopted. The core library is straightforward to use and connect with other libraries and current projects because it only focuses on the view layer. In addition, when combined with contemporary tools and auxiliary libraries, Vue is also completely capable of driving sophisticated single-page applications. We use vue.js in our project since it is lighter and more customizable than other frameworks such as React.

g)   Vercel:

Vercel is a frontend stack for web developers that isolates the backend and simplifies the development of websites and JavaScript-based applications.

It runs off the necessity to oversee a web server. It interfaces with your content or database and offers zero-configuration compatibility for 35+ frontend frameworks. Here, Vercel is used with nuxt.js and vue.js framework.

Vercel is a cloud platform for serverless and static frontends. It makes it possible for programmers to host websites and web apps that scale automatically, deploy rapidly, and don't need any manual intervention.

h)   RNN:

A Deep Learning model devoted to processing sequential data is recurrent neural networks. The output from the preceding step is used as the input for this stage. RNNs have a "memory" that stores all computation data.

It uses the same parameters for each input to perform the very same operation on all the inputs or hidden layers to generate the output. Unlike other neural networks, this reduces the complexity of the parameter set.

Most important applications of recurrent neural networks are machine translation and natural language processing. It can work really well with sequential data.

i)   LSTM:

LSTM or Long Short-term Memory is a special kind of RNN that is capable of learning long term dependencies. Hence it is used to remove the vanishing gradient problem of Recurrent neural networks. A memory cell known as a "cell state" that preserves its state over time plays a key role in an LSTM model.

Vol. 29

No. 6

计算机集成制造系统

Computer Integrated Manufacturing Systems

ISSN

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Think about the situation when one needs to edit some information in a calendar. An RNN applies a function to the existing data to accomplish this, entirely altering it. While LSTM just performs minor adjustments to the data through cell state-based addition or multiplication. This is how LSTM selectively forgets and recalls information, outperforming RNNs.

j)   RASA Framework:

Rasa is an open-source platform for creating chatbots that can both speak and write. The conversational AI is operating at Level 3, where the bot can comprehend context. A level 3 conversational agent is capable of addressing unexpected questions, handling context, and the user altering their opinion.

The finest Python framework for creating NLP-based chatbot systems is probably Rasa. The intent categorization, entity identification, and NLG models utilized by machine learning are very accurate. Rasa makes it very simple to understand the data format.

6. Conclusions

In this work, a chatbot enabled smart job application portal was designed and implemented that basically replaces the manual methods. This online web-based portal helps candidates to apply for jobs through the internet irrespective of their location around the globe. It is basically implemented in such a way that many loopholes or issues which exist in other portals and applications have been eliminated to a larger extent.

7. FUTURE WORK

For future work, more features can be added to enhance the user experience on this portal. Features like face recognition for login service, recommendation system and automation can also be integrated to this which will definitely benefit the eligible candidates.

8. Acknowledgment

References

1. S. M. Metev and V. P. Veiko, Laser Assisted Microtechnology, 2nd ed.,
2. R. M. Osgood, Jr., Ed. Berlin, Germany: Springer-Verlag, 1998.
3. J. Breckling, Ed., The Analysis of Directional Time Series: Applications to Wind Speed and Direction, ser. Lecture Notes in Statistics. Berlin, Germany: Springer, 1989, vol. 61.
4. S. Zhang, C. Zhu, J. K. O. Sin, and P. K. T. Mok, "A novel ultrathin elevated channel low-temperature poly-Si TFT," IEEE Electron Device Lett., vol. 20, pp. 569–571, Nov. 1999.

Vol. 29

No. 6

计算机集成制造系统

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5. M. Wegmuller, J. P. von der Weid, P. Oberson, and N. Gisin, "High resolution fiber distributed measurements with coherent OFDR," in Proc. ECOC'00, 2000, paper 11.3.4, p. 109.

6. R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, "High-speed digital-to-RF converter," U.S. Patent 5 668 842, Sept. 16, 1997.

7. (2002) The IEEE website. [Online]. Available: http://www.ieee.org/

8. M. Shell. (2002) IEEEtran homepage on CTAN. [Online]. Available: http://www.ctan.org/tex-archive/macros/latex/contrib/supported/IEEEtr an/

9. FLEXChip Signal Processor (MC68175/D), Motorola, 1996.

10. "PDCA12-70 data sheet," Opto Speed SA, Mezzovico, Switzerland.

11. A. Karnik, "Performance of TCP congestion control with rate feedback: TCP/ABR and rate adaptive TCP/IP," M. Eng. thesis, Indian Institute of Science, Bangalore, India, Jan. 1999.

12. J. Padhye, V. Firoiu, and D. Towsley, "A stochastic model of TCP Reno congestion avoidance and control," Univ. of Massachusetts, Amherst, MA, CMPSCI Tech. Rep. 99-02, 1999.