



TELEGRAM BOT DEVELOPMENT USING PYTHON

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Abstract -

Nowadays, the use of technology in the education sector is increasing. Digital technology has emerged as an effective tool to achieve the goal of the United Nations' Sustainable Development 2030 agenda of quality education. The recent COVID-19 pandemic has further strengthened the use of technology in education. The entire educational system has undergone a paradigm shift as a result of these digital technologies. The goal of this research project is to use Python to develop a flexible educational Telegram bot that provides students with access to a variety of educational resources according to subject matter and educational level. This project aims to develop a Telegram bot that can assist with Graduate Aptitude Test in

Engineering (GATE) candidates by offering necessary tools and resources such as the GATE syllabus, relevant reading materials, a customized study plan, and access to practice exams. Aspirants to the GATE will find this bot to be an invaluable and easily available tool that will help them prepare more effectively and increase their chances of success. The study uses a variety of Python programming approaches to develop an intelligent recommendation system for learning materials. Through chat interfaces, the Telegram bot engages users in seamless and engaging educational interactions.

The development of this educational Telegram bot has the potential to significantly improve the accessibility of learning resources and materials for a wide

variety of students. It adds to the discourse on the use of technology in education and the potential educational applications of chatbots. This study project demonstrates how Python may be used to create useful,

INTRODUCTION

Education that was once predominantly reliant on physical and traditional teaching methods is now seeing a paradigm shift. In this new digital age, digital tools and platforms have made information and learning resources accessible at one's fingertips. During the Covid-19 pandemic, we have seen how the whole education system relied on technology. From online lectures and digital textbooks to interactive learning apps, technology has expanded the boundaries of learning, transcended geographical limitations, and made education more inclusive and engaging. Digital technology has emerged as an essential tool for achieving the quality education goal of the United Nations' Sustainable Development 2030 agenda (Haleem et al., 2022, 275).

As stated by (Barakina et al., 2021, 286) education sector cannot stay away from the use of digital technologies and artificial intelligence technologies in the educational process. Digitalization of real-world apps that improve learning in a constantly changing digital environment.

Keywords: Python programming, Telegram, Education education is an integral part of the training of a modern specialist (Frolova et al., 2020, 314). Much modern literature (Haleem et al., 2022; Singh, 2021; Jobirovich, 2022) presents the effectiveness of the use of digital technologies in the educational sector. Digital technologies help students build skills involving problem-solving, thinking structure development, and process comprehension—abilities that will necessitate professional performance. They additionally get ready for a future that will be more uncertain and dynamic and in which technology will be indispensable. The skills and traits that students gain will be crucial to their success in the workplace. Through the abundance of digital tools, students can post their work or get the necessary data. Wikis, podcasts, blogs, and other Web 2.0 technologies help students create content, work together, evaluate each other's work, and progress toward co-learning (Haleem et al., 2022, 276). Digital technologies also inspire and motivate students to learn (Taylor et al., 2021, 3)

Within the context of this, the creation of educational chatbots is significant as a novel method of promoting learning by giving students quick and customized tools to help speed up the learning process, this bot seeks to access instructional materials. This study aims to harness the potential of Python programming language and the Telegram chat service to develop a flexible and intuitive bot that will support GATE candidates on their path to success. With

comprehensive GATE preparation partner. Access to the GATE syllabus

, customised study programs, reading lists, and a database of practice exams for self-evaluation are some of these advantages. The creation of this Python-based Telegram bot to help prepare for the GATE exam is in line with the expanding trend of utilizing technology to speed up learning and test-taking. This research makes a significant contribution to the field of educational technology and assessment since the integration of such tools into educational procedures is likely to become more common as technology continues to advance.

We created a compelling context for the development of the Python-based Telegram bot for GATE preparation by considering the role of technology in education and the specific goal of the research project in this introduction.

Literature Review

(Alekseev et al., 2021) developed a chatbot with artificial intelligence (AI) that is automated to send documents, check the correctness of the design of a document, and allow teachers to advise students on behalf of the bot. It can provide statistics and record all the events that occur. To classify the user messages based on intent, a machine learning model has been developed, and after training, it was found that the accuracy of the classification of user requests by the model was 97%. To interact with users, a free cross-platform messenger called Telegram was used, which allows users to exchange text and voice messages as well as media files of various formats. The developed machine learning model and an algorithm based on the Levenshtein distance were integrated into a

chatbot in Telegram.

(Barakina et al., 2021) take into consideration the experiences of different countries in implementing artificial intelligence (AI) in the educational process. The paper conducted a primary survey of students and teachers from various universities and educational programs. In the survey, about half of the respondents (48.6%) considered it impossible to get a high-quality humanitarian education without the participation of a teacher; moreover, approximately the same number of respondents (47.8%) expressed an opinion about the need for offline education. However, it is worth noting that a quarter of the respondents consider the format of distance learning with the use of ICT acceptable.

(Jobirovich, 2022) discussed the different aspects of the reform of the education system through digital technologies. The paper concludes that digital technologies help increase students' interest as a wide variety of content is available to them. Also, the use of digital platforms makes student technology friendly.

(Milicevic, 2015) dwells on how digital technology can affect knowledge. The paper pointed out that new technologies and digital learning tools have changed the world and the employment market. With technological enhancement and increasing digital learning tools, data and information are expanding at a very high rate. This could be bad for students who do not know where to start, what to read, or what not to read. Students may not know the limitations of the information available on digital platforms, and hence, educational institutes

need to adopt the new technology faster.

(Singh, 2021) seeks to examine the pros and cons of the digital classroom, along with the major challenges it poses. Some of the benefits of digital learning that the paper found are that larger sections of students can avail of courses of their choice free of charge, education has become available to the larger sections of society, and it can enrich the knowledge system with global exposure. The paper also found that digital technology in the classroom has some serious limitations. Some of the limitations are that it is seen that many times teachers are uncomfortable with the new technology and need extra efforts to update themselves with new technologies required in digital classrooms, and overreliance on digital technology may slow down the learning process of both students and teachers. It also truly pointed out that the unequal distribution of digital technology in education may also lead to unwanted outcomes.

(Haleem et al., 2022) examines the need for digital technology in education and the challenges it faces. Some of the advantages of digital technologies in education that the paper pointed out are that educational resources and digital tools help to improve the classroom atmosphere, make the teaching-learning process more compelling, and give greater flexibility and customization of curriculum to the education institutes. It is expected that students will engage more in the learning process. At the same time, there are some challenges with digital technologies in education. Some of them

are that students from low-income backgrounds cannot have access to cell phones or other devices, and many times teachers also do not have expertise in digital technologies. Additionally, excessive use of mobile phones, laptops, etc. causes headaches and eyesight issues in children.

(Frolova et al., 2020) did a systematic review of modern scientific publications devoted to the digitalization of education. It found some important advantages to the digitalization of education. Some of them are: it provides an individual learning path for the students; a differentiated form of learning; and knowledge control. However, there are certain risks and destructive consequences associated with it. From the teachers' perspective, it is the displacement of experienced teachers with insufficient levels of competencies. From the student's perspective, the introduction of digital technologies in education overloads the available information, increases cognitive disorders, and creates issues with interpersonal communication skills, analytical skills, etc.

(Taylor et al., 2021) reviewed academic literature to understand the use and impact of digital technology in education. The paper concluded that digital technologies provide positive learning outcomes beyond classroom limitations. It identified that teacher competency and overall digital literacy skills can be developed with appropriate teacher- focused training. Teacher engagement, support, and professional development are crucial factors for the successful integration of digital technologies in education. Innovative professional development, which

caters to collective and individual teachers' technological needs, may need to be implemented.

Proposed Method

Collection of GATE syllabus data: The first step to creating a Telegram bot is to collect the latest GATE exam pattern. Data sources for study information include the official GATE website, educational institutions, or publicly available documents. The bot has to get and organize this study data to answer the user's questions about GATE exam topics.

Select and organize study materials: To help GATE aspirants, the bot needs a compiled collection of study materials, including textbooks, lecture notes, and references. Data collection involves identifying high-quality instructional materials and categorizing them by topic. These resources can be accessed from open educational resources (OER), university websites, or educational YouTube channels.

Collecting practice questions and mock tests: One of the main functions of the bot is to provide users with practice questions and mock tests to assess their GATE preparation. The data collection includes collecting practice questions and mock test storage for each GATE course. These questions are solved by experts or can be obtained from previous GATE exam papers. **Bot interaction data:** Data collection also takes place when the user interacts with the Telegram bot. The bot can collect data about the user's preferences, frequently asked topics, and the effectiveness of its responses. This data can be analyzed to improve bot performance and

provide a more personalized learning experience.

Regular updates and maintenance: Since GATE exam patterns and study materials can change over time, the bot needs to gather up-to-date information. Regularly updating the bot's database of resources and course information ensures that it is important.

Data processing and management: Data collected from various sources should be simplified and stored in a structured database or storage system so that it can be easily retrieved and accurate answers to users' queries. The data system can generate classifications of items by subject, exam year, and topic, as well as version control for study data.

It is important to ensure that the data collected is up-to-date, accurate, and reliable. Ethical considerations and data privacy should also be considered to ensure that users' data is used following relevant legal and privacy guidelines. By collecting and managing information effectively, the Telegram bot can provide GATE candidates with a valuable educational experience, providing them with more relevant and helpful study materials and resources.

System Architecture

System Architecture of the Telegram Bot for GATE Exam Preparation:

Telegram Bot Service: Telegram bots are deployed on the Telegram bot platform, which provides the infrastructure and APIs required for bot development. It communicates with users through the Telegram app, making it easily

accessible to more people.

Wirebot Library: Python uses the pyTelegramBotAPI library to interact with the Telegram Bot API. This library simplifies the process for users to send and receive messages and execute various bot commands.

Message management: A bot contains multiple message controls, each performing a specific task. For example, there are message handlers for commands such as /start, /help, /syllabus, and so on. Message processors process user input and provide appropriate responses.

Key arguments: The basic logic of a bot is responsible for processing user requests, fetching data, and generating responses. This understanding includes understanding user information and extracting relevant information.

Sources: The bot interacts with data sources, e.g., GATE Study Profile, learning materials, and the use of mock quizzes and tests. Data sources can include external websites, databases, and local repositories.

Data Storage: A database is used to store and manage the collected data. Databases store information about curricula, learning materials, and practice questions, making it easier for users to find relevant information.

Interaction by users: The bot provides user-friendly functionality where users can input commands or questions. Users interact with bots through text-based interactions, sending commands, and receiving responses.

Distribution: Content distribution consists of sending learning information, learning materials, resource links, practice questions, and mock tests to users. The content is structured, and links are made dynamically to provide the most relevant information.

External APIs: In addition to the Telegram Bot API, the system design can integrate with external APIs that can fetch real-time data or other information, such as the latest course information.

Modifications and Corrections: The configuration of the bot must support easy updates and maintenance to keep the bot current and

responsive to changes in GATE testing materials or user needs.

Scalability and Performance: The architecture must be able to be constructed to handle several users simultaneously. Scalability and performance considerations ensure that the bot can meet its growing user requirements.

Security Privacy: Security measures are used to protect user data and bot activity. Privacy is taken into consideration to ensure that user data is processed by applicable laws. The architecture provides a systematic way in which the Telegram bot acts as a teaching tool for GATE exam preparation. It collects and maintains data, handles user interactions, and provides valuable information to assist prospective students in their exam preparation. It's important to maintain and update the bot to ensure it's relevant and useful for the long term.

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