IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

EIRA – A Cyberbot

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Abstract: Artificial intelligence (AI), speech recognition systems (ASR), and machine learning advancements have made it possible to create clever computer programmes known as chat bots. The user can type commands into chat bots' text-based user interfaces and receive responses in text and text to speech. Chatbots often serve as stateful services, remembering past commands and possibly even conversations. In numerous fields, including customer service, sales, and marketing, a variety of chatbots have been proposed to deliver various functions. In the area of information security, chatbots are not currently being evaluated for use as advisors. However, most people, particularly common users with no technological expertise, are ignorant of numerous information security-related topics. As a result, we suggested in this article a chatbot that serves as an information security advisor. A knowledge base with a JSON file is used by the suggested advisor. By providing correct advice based on many viewpoints from information security experts, such a chatbot might increase awareness in the subject of information security, among other benefits.

Keywords: Information Security, Security Knowledge Framework

INTRODUCTION

Large-scale data breaches and cyberattacks have a detrimental impact on hundreds of organisations and businesses each year. This is largely because information systems don't have enough security safeguards and controls in place. Yet, due to developers' frequent lack of sufficient training and the fact that security is often treated as more of an afterthought than a priority, secure coding standards are far from the norm in software projects. In turn, as a result of careless choices and subpar security design procedures, several risks and vulnerabilities appear. This paper offers a chatbot application text-based entities to provide information security advice for users in order to enhance the awareness of regular users, who increasingly utilise technologies but who have no background regarding the necessary information security features to protect themselves. The back-end interface that interacts with a knowledge base will be developed in this study. This knowledge base serves as a repository for specialists' knowledge in the area of information security. The chatbot is able to comprehend queries and questions from users. It's vital to note that the suggested chatbot in this paper extracts keywords and searches the knowledge base for relevant responses.

LITERATURE REVIEW

The study's analysis focuses mostly on technical security elements relating to chatbots, but the authors also need to discuss the social implications of employing chatbots to fully cover the security topic. Because chatbots aim to grab users' attention and keep them in dialogue, social features may expand. Natural language communication is crucial for human-to-human expression of emotions, thoughts, and worries. Chatbots might adopt the user's rhetoric as they get to know them better. One such instance is Microsoft's social media-based chatbot "Tay," which, in less than sixteen hours, "evolved" from a normal teenage girl to a chatbot showing anti-Semitic, racist, and misogynistic beliefs. Moreover, the social media-based chatbot "Zo" from Microsoft developed certain offensive tendencies. Many ML systems feature damaging, hard-to-remove biases that resemble those of humans, despite the best efforts of their designers. Chatbots, on the other side, can be pre-biased and, for instance, programmed to sway conversation and public opinion. Social chatbots soon began distributing pre-programmed material on a variety of social media platforms. Even chatbot assistants that provide consumers recommendations for restaurants, flights, financial products, medicines, and other services can be pre-programmed to present users with preset goods. As a result of "product placement," chatbot developers can earn extra money, but it's important to remember that people trust chatbots since they operate around-the-clock.

Because messaging is quick, simple, and genuinely seems like a conversation, chatbots are made to attract users' attention and to utilise tailored message precisely Conversational Marketing to assist or sell you a product. As chatbot design methodologies advance, it becomes harder and harder to tell if a conversation is being carried out by a human or a chatbot. Some chatbots can even help with mental health support, although doing so needs them to have a fairly high conversational level. Such social chatbots have the potential to collect useful data from its users or potentially expose them to intrusion by other chatbots. The Turing-Test competition with the longest history is the yearly Loebner Prize. The computer programmes with the most human-like characteristics win awards in an artificial intelligence competition. No chatbot has ever won the golden medal for the Loebner Prize responses which cannot be distinguished from humans. Certain chatbots, though, managed to get 3 out of the panel's 12 judges to rate them as human. Large internet firms have access to a vast amount of conversational data and the funding to pay talented engineers. This will help chatbot speech sound more human-like while also utilising better chat bot design strategies. This will increase the credibility of chatbots on social media, increasing their ability to sway public opinion.

SCOPE OF THE PROJECT

Technology users, as well as users of crucial and private apps like banking, are both rapidly growing populations. Many of those users lack the majority of the essential components of information security or have inadequate knowledge of them. As a result, these users are in danger because they are available to numerous criminals. Additionally, such users operate in a setting where cybercrime is constantly on the rise. Also, criminal tools and programmes are developed and enhanced regularly, necessitating ongoing protection and advice from information security professionals.

Offering consulting services in a crucial area like information security is significant and essential in helping many users become more aware of the importance of information security. Users' security dangers can be lessened by increasing their knowledge of information, which also enables them to take the necessary precautions to defend their society and themselves. By using chat bots, it is possible to have a high level of security in various areas. Hence, the researchers aimed to offer the consumer an intelligent virtual information security adviser who could respond quickly and accurately. To the best of our knowledge and after reading extensively through the previously published research work, we discovered many chat bots that offer service in many domains, including medical consultation, airline assistance, tourism, and so many other applications. Unfortunately, we were unable to locate any chat bots that assist users in receiving information security advice. The goal of this project is to help find a solution to the issue of applicants' and universities' direct communication. The following are the project's primary goals:

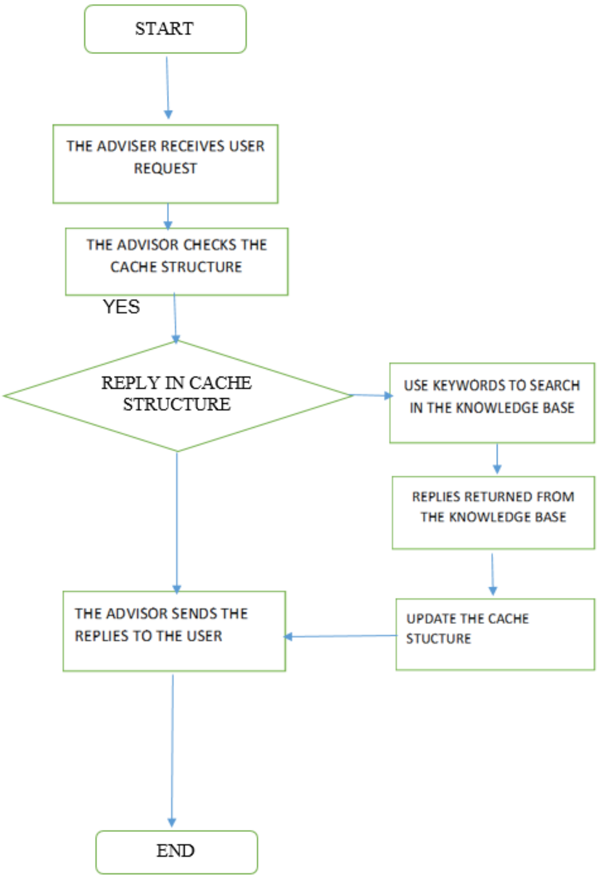
Database: To create a database that will include all of the pertinent data regarding questions, answers, keywords, logs, and feedback.
Algorithm: Create a string distance comparison algorithm and a keyword matching algorithm, then combine them to find the optimum solution.
Interface: Provide a web interface that will allow prospective students and their families to ask questions of a chatbot and receive convincing answers. Any computer that supports an operating system that the Java Virtual machine can load can host the web system.

IMPLEMENTATION

In order to create realistic timeframes for each step of the project, the methodology section outlines the strategy and process to choose an acceptable approach for the chatbot's overall development. The planned experimental environment and the SKF chat bot's architecture are both described in the subsections that follow.

Experimental Framework

Using artificial algorithms that evaluate user searches and comprehend user messages, a security bot project is created. This system, a web application, responds to questions about information security. Consumers only need to send a question through the chatbot. There is no required chat format; users are free to use any format they choose. The System responds to the question using built-in artificial intelligence. The responses are pertinent to the user's inquiries. The user only needs to click the button labelled "invalid answer" to alert the administrator to the flawed response. Admin can log in to the portal and view incorrect responses. The system enables the administrator to add a specific answer to that equivalent question or to eliminate the invalid answer. With the system, the User can inquire about any security-related activity. The user does not need to travel alone to make inquiries. The chat bot evaluates the query before providing the user with a response. The algorithm responds to the question like it were being answered by a person. Artificial intelligence is used by the system to respond to user queries. The user interface used by the system to respond effectively gives the impression that a real person is conversing with the user. The user can query about the security related activities through online with the help of this web application. This system helps the users aware of the Information Security related knowledge.


START
THE ADVISER RECEIVES USER REQUEST
THE ADVISOR CHECKS THE CACHE STRUCTURE
YES
REPLY IN CACHE STRUCTURE
USE KEYWORDS TO SEARCH IN THE KNOWLEDGE BASE
REPLIES RETURNED FROM THE KNOWLEDGE BASE
UPDATE THE CACHE STUCTURE
THE ADVISOR SENDS THE REPLIES TO THE USER
END

Actions Followed by Chat bot

Algorithm Used

The chatbot algorithm used in this project was created by Michael Maudlin and initially appeared in the book Julia in 1994. For the building of verbot, the first AI-based Chatterbot, he had created this algorithm.So whilst consumer submits its Question, we keep that during a variable "query".After that we carry all the principle key phrases from query desk of the database and take a look at if "query" carries any of the principle key phrases in it.If No then we are saying no solution found.If Yes then we carry all sub-key-word with its solution of that matching Main key-word.Then we pass "query" via four kewyord take a look at procedure ** four Keyword take a look at is checking all of the four sub-key phrases are in "query" Code: if(strpos($query,$k1) !== false && strpos($query,$k2) !== false && strpos($query,$k3) !== false && strpos($query,$k4) !== false).If any of the access suits the key-word then we take its solution after which publish it to the user.If it does now no longer suit then we pass "query" thru 3-key-word suit algo.If it and so forth for two and 1 key-word match. And if we still don't get the output we say No Answer Found System Design Systems design is The technique of defining the architecture, components, modules, interfaces, and statistics for a gadget to meet distinctive requirements. One may define systems design as the application of systems theory to product development. The fields of systems analysis, systems architecture, and systems engineering have certain areas of overlap.

RESULTS AND DISCUSSION

CYBERBOTS are a permanent fixture in society. They are already present in our computers, smartphones, and smart home appliances and have integrated completely into our daily lives. Cyberbot technology aids individuals and organizations in handling several monotonous and repetitive jobs swiftly, while not being perfect yet. The core of conversational interfaces is undoubtedly that. Their goal should never be to take the place of a person. They are here to assist us in the most natural way for us to learn about the topic of information security through human-like communication.

Analysis: To determine the needs of the chatbot, this segment will comprise a variety of software approaches. Quantifiable input will be gathered from questionnaires that will be analyzed. The system requirements for both internal and external hardware are listed. The overall design of the chatbot will be covered in this section, along with UI diagrams and storyboards that show how the GUI will seem to the user.

Implementation and testing - This section will describe how the solution was implemented, including the code that was utilised to create compelling features. Describe the lessons learned from each iteration, and record each prototype. The chatbot will be tested after implementation is complete using unit testing and the relevant test cases. To ensure the highest level of quality, any mistakes or flaws found will be corrected.

Assessment and reflection - To assess the finished project's quality and worth, an evaluation will be conducted. It will describe in detail how the project as a whole was created. Considering the overall experience, noting what went well during the project and any areas that should be improved for future work.

CONCLUSION AND FUTURE WORK

In this study, we created a chatbot that gathers keywords from user conversations, uses those keywords to search a knowledge base in a JSON file, and provides users responses that match. There are several benefits to having such a chatbot. These benefits include increasing knowledge in a crucial area, which lowers the security risks common users confront. Moreover, giving a prompt and precise response. The initial deployment of this chatbot is planned for the Telegram platform.

The future development will concentrate on JSON deployment across more platforms. The planned chatbot's implementation across several platforms is thought of as future development. The newest apps are chatbots! Implementing the aforementioned deliverables allowed for the addition of basic chatbot functionality to the I. This included configuring and creating accounts for bot users with bot settings, activating a bot whenever a user requested it via post in a thread, and implementing a simple weather chatbot that provides weather information whenever a user requests it and explains that it can also engage in conversation with the bot. Its goal is to improve the system that CS298 has already established. The next stage in creating chatbots is to assist users in facilitating their work and interacting with computers through the use of natural language or a set of rules. EIRA - CYBERBOT of the future, supported by machine learning technology, will be able to recall previous conversations and draw lessons from them to respond to new ones. Speaking with numerous users and bots at once would be difficult.

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