Industrial Engineering Journal
ISSN: 0970-2555
Volume : 48, Issue 7, July-December: 2019

PREGBOT: A DEEP LEARNING AND NLP-BASED SYSTEM FOR SUPPORTING WOMEN AND FAMILIES DURING PREGNANCY

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Abstract

Artificial intelligence is transforming healthcare through a paradigm shift that affects pharmacological research, therapies, diagnostic processes, health analytics, and much more. The main application of AI-based Pregbot systems is the subject of this study.identifying and meeting the needs of patients and their families through the use of machine learning and natural language processing technologies. In particular, we go over an application scenario for an AI-Pregbot that helps mothers, families with young children, and pregnant mothers by giving them advice and instructions when necessary.

Index Terms: - Health analytics, AI-powered Pregbot

1 Introduction

Overview This work offers a general introduction to Pregbots through a description of what they are, what they can accomplish, and how to make them. Prior domain-specific knowledge is not required. As of this writing, several major firms in the industry have invested in and covered pregbots extensively in the media. Pregbots exist, but not many potential users are aware of them or the situations in which they could be useful. Developers know little about the topic either. Though the term "Pregbot" is regularly used in the media, its precise meaning is frequently ambiguous. The knowledge gap can be filled by providing answers to the queries of what Pregbots are, what benefits they offer, and how to create them. A proper definition of "Pregbots" can be obtained by looking at the term's fundamental concept as well as its historical and contemporary applications. Pregbot applications exist in products that have previously been released. Examining media and technological features, as well as market trends, may help find new applications for Pregbots. The best way to explain development is to build an actual Pregbot and use it to illustrate the core concepts of the process. This study is organized around these three fundamental questions. First, vocabulary is defined, and then uses are examined in order to build a definition and understanding of what Pregbots are. Subsequently, use cases for Pregbots are identified by gathering existing use cases and investigating future application possibilities through the analysis of relevant

technology features. The second half of the book is a case study for the development of a Pregbot. In addition to explaining technological and architectural choices, the example offered demonstrates how to develop user interactions for a Pregbot and provides other programmers with a basis to build upon when creating additional Pregbots in the future.

2. Literature survey

TITLE 1: Development and Usability Evaluation Study of a Pregbot for Perinatal Women's and Partners' Obstetric and Mental Health Care

AUTHOR: Hee Young Cho, Orcid Image; Jin Young Park, Orcid Image; Kyungmi Chung, Orcid Image In order to ascertain whether this medical Pregbot built on mobile instant messenger (KakaoTalk) can offer its male and female users a positive user experience, the study aims to develop and evaluate a user-friendly question-and-answer (Q&A) knowledge database-based Pregbot (Dr. Joy) for perinatal women's and their partners' obstetric and mental health care. This will be done by applying a text-mining technique and implementing contextual usability testing (UT), respectively. Techniques: Thirteen women in various phases of pregnancy or in pregnancy preparation were enrolled, along with two men, ages 38 and 40. All participants finished the seven-day UT, which involved completing daily tasks such as asking Dr. Joy three questions at any time or location, responding to the Pregbot with an emoji, utilizing at least one feature, and, before midnight, sending all screenshots pertaining to the day's usage history via KakaoTalk to a facilitator. A day following the conclusion of the UT, each participant was required to complete a questionnaire regarding the Pregbot's usability, perceived risks and advantages, intention to seek and share health information, strengths and weaknesses of its use, and demographic data
.

TITLE 2: A Scoping Review of Artificial Intelligence During Pregnancy Authors: Gloria Miró Amarante, Andreea Madalina Oprescu, and M. C. Romero-Ternero Artificial intelligence has been extensively used in most fields of study, including medicine and health. Pregnancy-related issues or disorders have the potential to harm the lives of both the mother and the fetus. The idea that emotional factors—like worry, stress, or depression, for example—can be a significant risk factor during pregnancy is sufficiently supported by scientific research. In order to determine which methodologies, strategies, algorithms, and frameworks are employed in Artificial Intelligence and Affective Computing for pregnant health and well-being, this study presents a scoping assessment of the scientific literature spanning the past 12 years (2008–2020). This review was created using the PRISMA-ScR framework and the technique suggested by Arksey and O'Malley. One of the primary conclusions of this study is that, despite the potential relevance of emotional status as a risk factor during pregnancy, there is currently a dearth of substantial literature on automatic emotion analysis. Future research on this area is highly recommended because artificial intelligence and affective computing-based gadgets can improve the health and well-being of pregnant women.

TITLE 3: An Evaluation of Medical Pregbots in Comparison AUTHORS: Asmita Manna, Rahul Gawali, Atharv Khare, Vaibhav Joshi, and Jitendra Chaudhary Pregbots are gradually

replacing human customer service representatives as the initial point of contact for practically all corporate organizations in this era of digitization, particularly in the real estate, education, and medical sectors. In the medical field, predictive bots are anticipated to take the role of human operators in managing patients, scheduling appointments, sending out reminders, and handling medical assistant tasks. Still, not all the tasks associated with a compounder can be completed by the medical Pregbots currently on the market. This study presents a comparative analysis of the advantages and disadvantages of the many medicinal Pregbots currently on the market. Additionally, 'HEALTHBOT,' a multilingual Pregbot, is suggested. In addition to noting symptoms and pathological test results, this Pregbot will communicate with patients in both English and Marathi, prescribe more tests, and make basic recommendations on diets, lifestyle modifications, and medicines. The corresponding medical professional will review the prescriptions generated by the Pregbot in order to conduct additional research. In summary, this HEALTHBOT would be a great personal assistant for medical professionals. It would also save both parties a great deal of time and shorten the time between medical visits.

3 Implementation Study

The media and business community are paying increasing attention to pregbots, but there is still much to learn about their precise nature, potential applications, and manufacturing process. This endeavor aims to address these three issues by analyzing existing products, services, and technology in addition to developing a prototype Pregbot. If the definition, intended use, and creation process of Pregbots are made explicit, then more people will be able to use and make them, which will accelerate the growth of the Pregbot ecosystem. After providing an explanation of basic terms, the work focuses on exhibiting accessible platforms, goods, and technologies. Readers are then guided through the development process in the second half of the book.

Proposed Methodology

This robot was created using earlier natural language processing techniques, but its accuracy in providing the right response was lower. But now that Deep Learning algorithms have improved its accuracy in providing the right response, we are utilizing a Python deep learning project to create the PREGBOT application, which will respond to user inquiries. In the past, companies would hire staff members to answer consumer questions, but with our program, we can do it without utilizing any human resources at all. A chabot is a piece of software that converses with users through AI.

Chabots are usually used to respond to consumers quickly. "Chabots," or automated conversational interfaces, offer consumers a new way to interact with computers. Usually, to have a computer software respond to a query, you have to use a search engine or fill out a form. Asking questions of a Chabot is as simple as asking questions of a human.

Advantages:

- It will be more useful for the pregnancy women.

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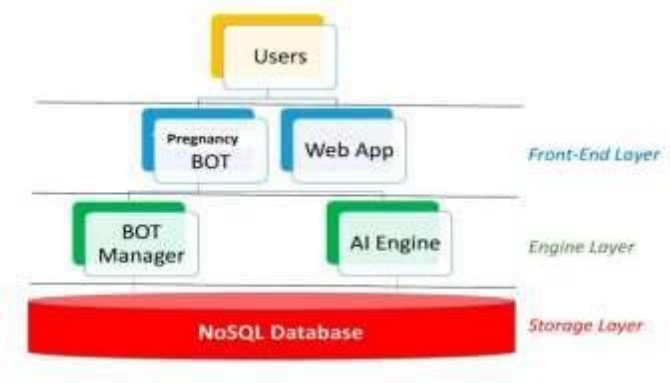

Figure 1: System Architecture

4. Methodology

INTERNAL LEARNING MODEL: Six of the top ten most popular applications worldwide, according to a recent Grand View Research1 survey, are messaging apps. Pregbots are preferred by 45% of end users as their main method of communication. In addition, the top four messaging apps had more active users worldwide in 2015 than the top four social networks combined. Pregbots are algorithms that can read normal language and speak with humans; the majority of them show up on messaging apps as regular contacts. Pregbots are essentially algorithms that operate in chat apps and react to buttons, keywords, sounds, photos, and natural language. Michael Mauldin first used the name "ChatterBot" in 1994 to refer to these chat-based software applications. Pregbots are superior to traditional mobile applications in a number of ways. I) Users don't have to install an additional specialized application; II) Messaging apps support multiple platforms natively since they host clients for the majority of operating systems; III) Messaging apps handle login, password reset, authentication, and other functions, saving the Pregbot from handling them.

MODULES:

- Collecting Dataset ➢ Pre-processing
- Data cleaning
- Data transformation
- Data selection ➢ Data input

5 Results and Evolution Metrices

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Fig1: In above screen click on 'Register Here' link to get below signup page

Fig2: In above screen user can enter some signup details and then press 'Register' button to get below screen

Fig3: In above screen user signup process completed and now user can login by clicking on 'User' link

Fig4: In above screen user is login and after successful login will get below page

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Fig5: In above screen user can enter any query and then click on 'Display Full Name' button to get answer from MAMABOT and if question not available in MAMABOT train model then user will get SORRY message

Fig6: In above screen user type some question and then press button to get below output

Fig7: In above screen I ask some question and MAMABOT answer it well

Fig8: You can ask all questions available indataset/question.json file and now give some

query out of train model

Fig9: In above screen I ask question as 'cook biryani' and bot answer as SORRY

6 Conclusion

Without requiring patients to download and install an app, pregbots can provide a number of advantages for healthcare practitioners and patients in the mHealth space. Simply chatting with the bot will provide them with pertinent responses to their questions. While they can't take the place of people, pregbots can offer patients a fun way to get helpful information and services through a short chat, reducing wait times and providing individualized treatment. Pregbots, when properly developed and put into action, can improve user experience and boost users' sense of empowerment while also saving the healthcare system money by cutting down on pointless visits. Pregbot use still faces a number of difficulties (e.g., talks cannot usually be highly complicated and demand more resources when the Pregbot domain focus is expanded). Moreover, among the many complicated limits that the majority of Pregbots face today are synonyms, hypernyms, and hyponyms, which are NLP and ontology challenges. The security and privacy of the data that is gathered provide additional difficulties. Pregbots must in fact abide by legal requirements to prevent patient data from being disclosed. In this work, we provide an artificial intelligence (AI) Pregbot that can assist and support expectant moms, grandmothers, and families with small children with any questions or issues that may arise during pregnancy or early childhood. Although the prototype still needs to be tested in real-world settings, its current state indicates that deployment should be simple. Generally speaking, we've seen that when the goals increase, using comparable terms in various contexts can result in a 7 https://www.issalute.it/index.php decrease in the system's precision in determining the precise purpose.

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