VIRTUAL NURSING ASSISTANT

Pallavi Deshpande

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Abstract

Virtual assistants can be used to deliver innovative health programmes that provide appealing, personalised, and convenient health advice and support on a large scale and at a low cost. Design elements that influence the virtual assistant's look and feel, such as visual appearance or language features, may have a significant impact on users' experience and engagement with the assistant. Patients benefit from personalised experiences provided by an AI-powered virtual assistant. It assists them in identifying their illness based on symptoms, monitoring their health status, scheduling doctor appointments, and other tasks. Instead of looking for the root causes of your symptoms, you can ask the virtual nursing assistant to assist you. When you have common illnesses or complaints, the healthcare assistant will not only provide medical advice but will also allow you to schedule an appointment with a doctor or a specialist. Besides this, the virtual assistant would be available 24/7, allowing it to answer your questions and provide answers in real time. This AI application can be used to increase patient engagement and improve self-management skills in order to prevent chronic conditions from worsening.

1.0 Introduction

Machine learning and artificial intelligence advancements hold the promise of delivering automated, tailored, convenient health assistance with a remarkable level of intelligence and personalization, and are already contributing to the transformation of health care. Virtual assistants are digital services that imitate human conversation and provide personalised responses based on the user's input. They can be programmed to have structured conversations or to respond to questions from the user. From simple menu or multiple choice-based assistants to more advanced and powerful virtual assistants with natural language processing that recognise free speech or text, capabilities range from simple to advanced. Virtual assistants are currently widely used in web-based banking and service settings, reducing reliance on staff by answering consumers' questions about products and services on demand. Virtual assistants are also being developed for a variety of health applications, such as providing cognitive behaviour therapy for depression and anxiety, improving diet and physical activity, and conducting remote patient monitoring. Despite the exciting potential for using virtual assistants in health, the technology may be ineffective or even have unintended negative consequences if it does not meet the user's needs and preferences.

A virtual health assistant's user experience can be defined as the user's perceptions and responses (e.g., emotions, beliefs, preferences, and behaviours) as a result of its use or anticipated use. A variety of factors influence user experience, including presentation, functionality, and interactive behaviour. To provide a positive user experience and encourage engagement, virtual assistant designs must be optimised. A growing body of evidence suggests that design elements that influence the look and feel of the virtual assistant, such as visual appearance, communication method, and language features, are important to consider for design, as these design elements can significantly influence users' psychological and emotional responses and engagement with technology-based applications. Furthermore, while some design decisions may have no effect on cost (for example, whether an avatar should be male or female), others may have a significant impact on the cost of designing a virtual health assistant (eg, whether an avatar should be animated with facial expressions). Understanding how such design elements influence user experience will aid in making the best use of limited health software development budgets.

The body of evidence supporting the use of interactive virtual health assistants is rapidly expanding in both quantity and quality. Experimental research designs with interactive virtual assistants, in particular, are increasingly being reported, which should provide clearer evidence of the influence of design characteristics on user experience. A scoping review methodology provides an explicit, systematic way to review this large and diverse body of literature while minimising bias. In this study, we hope to conduct the first scoping review of virtual health assistant design characteristics, with the goal of gathering the best evidence available on the effects of design characteristics on the user experience of interactive virtual health assistants.

1.1 Initial Needs Statement

Provide an overview of all experimental research examining how virtual health assistant design characteristics affect user experience. Summarize experimental research findings on how the design characteristics of virtual health assistants affect user experience. Determine whether research supports making design recommendations for virtual health assistants.
Bringing together the available evidence on how design characteristics affect the user experience of virtual health assistants will aid researchers and software developers in making decisions about the look and feel of their software and developing the most user-friendly and effective virtual health assistants.

2.0 Customer Needs Assessment

- The customer needs a virtual assistant who will interact with them as if they were real people. To interact with the customers effectively, the virtual nurse must first understand their emotions and mood.
- Interactional Chatbots: Conversational chatbots, which are run by NLP, process patient responses using human logic to provide relevant and accurate responses.
- Checker for symptoms. To interpret the patient's condition, the chatbot avatar should collect information about symptoms. The algorithm should adhere to the same protocols as in-person checks.
- Informative Content: Bot contains additional information that patients may require (dietary recommendations, how-tos, reliable healthcare stats, etc.)
- Online Consultation: Consultations are just one of the many nursing tasks that nurses can complete online with the help of a telehealth framework. If your practise offers telehealth services, patients would benefit greatly from a redirect option from the virtual nurse app to a telehealth platform.

3.0 Target Specifications

All medical procedure participants may benefit from this product:

- Patients: A virtual assistant app can be used by both inpatients and outpatients as a standalone or as part of a treatment plan. An assistant allows patients to self-assess their symptoms by answering questions in the app.
- Providers: Exhaustion is a reality for many medical providers as a result of the Covid-19 pandemic. A virtual nurse app reduces nurses' workload without compromising care quality.

Virtual nursing assistants take the experience to the next level. Instead of speaking with a healthcare professional over the phone or via video conference, the virtual nursing assistant offers a chatbot experience in which patients can record their daily exercise and fitness habits and ask questions. This type of app is beneficial to both patients and healthcare professionals because it allows both to see and understand personal health data that may contribute to an illness or condition.

4.0 External Search

4.1 Applicable Standards:

- Specifications for hardware or software, infrastructure building & maintenance
- Data management systems involved; standards and interoperability
- Use of digital technology to conduct surgical or invasive procedures remotely
- Other aspects of telehealth such as research and evaluation and continuing education of healthcare workers
- Does not provide for consultations outside the jurisdiction of India

4.2 Applicable Constraints:

- Product development takes a long time: If you are the founder of a startup, you should consider whether you can wait a while to develop your application. With the integration of artificial intelligence and blockchain, it is a large-scale process that necessitates the presence of many specialists from both the IT and medical industries. Of course, it all depends on the future application's intended functionality.
- Correct application is operational 24/7: You must be prepared for your application to function properly and without errors at all times. Even minor errors can cause your customers to be dissatisfied. As a result, before releasing the product, it must be thoroughly tested. You must determine whether your application can handle a significant increase in users. As a result, you can use this challenge to your advantage as well as your disadvantage.
- Constant updates following launch: If a virtual nurse app development company created a medical application for you, its developers should continue to work with your application after it has been released. They understand all of its complexities and will ensure that it is updated on a regular basis and that any errors are corrected. Despite these challenges, developing a virtual nurse app can help you take your business to the next level and announce your company or startup to the world.
- Product marketability: You must be clear about where you intend to run your application. Determine which countries are ready for your product as well as any legal requirements. You can enter the developed market, where there are already many different virtual nurse apps, and gain a share of the customers there. Consider countries that are potentially ready for healthcare innovations but lack comparable medical applications.

4.3 Business Opportunity

With rising life expectancy, an ageing population, and a bigger focus on health in general, there will be increased demand on the health-care system and changes in the health-care sector. Technology companies respond to changes in the environment by developing products and developing solutions to current problems. One solution is to hire a Virtual Nurse Assistant.

Virtual Nurse Assistant is an automated analytics and information system designed to improve the quality and efficiency of health care while making the work of medical staff easier in nursing homes, hospitals, health centres, and rehabilitation centres.

5.0 Concept Generation

5.1 Problem Clarification

One of the most common problems that today's people face is a lack of disease knowledge and immediate first aid consultation. As a result, many people may experience physical and mental stress as they try to figure out what is causing their condition. In some cases, they died, and common diseases became life-threatening.

To solve these problems, we need the virtual nursing assistant which:

- provides immediate and appropriate medication so that anyone with an internet connection can access it regardless of time or location.
- bridges the gap between users and doctors by providing online video services.
- assists users in maintaining a healthy lifestyle.
- and reduces paperwork and automate the current system

5.2 Concept Generation

We are providing an overview of how to carry out the project.

- The first step is to design the project's user interface, which is how the project will appear in real life.
- The second step is to write the web service's frontend in HTML/CSS/JavaScript/jQuery.
- The third step is to code the website's backend. Back-end code can be written in PHP.
- The web service is then linked to the database. To create a database for our web service, we can use MySQL.
- The final step is to put our web service on the webserver.

Features of our application:

- Symptom assessment
- Chronic patient care
- Insurance services
- Health risk assessment
- Wellness assessment
- Mental health services

6.0 Final Design

6.1 How does it work?

The use of artificial intelligence in nursing patients with chronic diseases reduces the likelihood of re-hospitalization. In the hospital, the doctor communicates with the patient and prescribes medication. The patient returns home, and the application assists them in taking their medication on time and for the correct period.

Furthermore, a virtual nurse communicates with a patient every morning to check on their health. She speaks like a living person, with emotions and tones that make the user feel at ease and cared for. This nurse is capable of capturing the patient's mood and emotions. She enters the data into a secure database that is only accessible to nurses and doctors at the clinic. If the programme detects a deviation during communication, it notifies the appropriate medical staff.

A patient can also obtain the information he requires by interacting with a chatbot, which is similar to interacting with a real person in this application. A patient can find the nearest medical centre, read prescriptions, and access useful medical information.

At the same time, the doctor has access to all daily records that are part of the medical card via the app. They have easy access to the data. As a result, 24-hour patient care enables them to respond quickly to even the slightest deterioration in health and take appropriate measures. In the application, the doctor can communicate with patients.

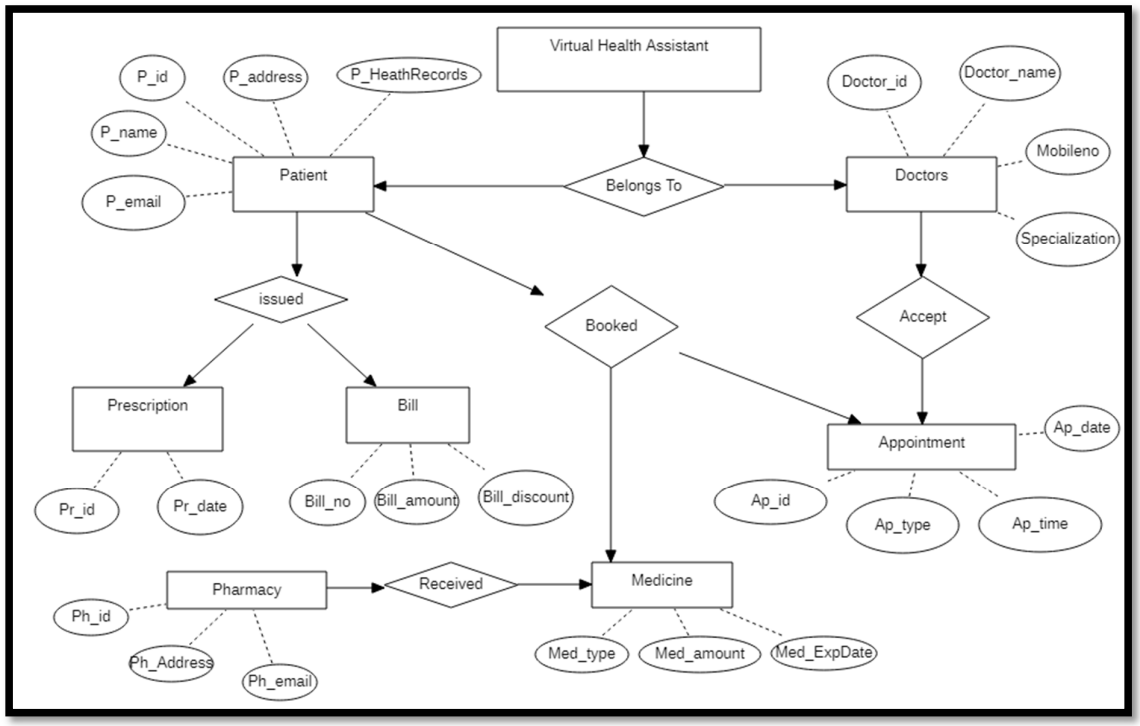

Fig. Working of the application

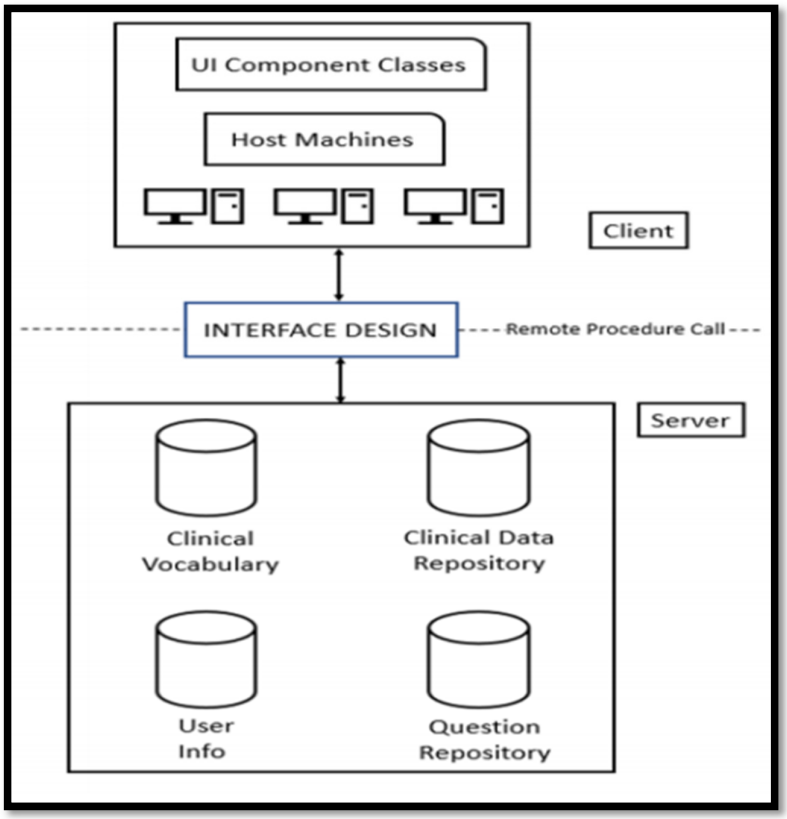

Fig. Flowchart of the virtual assistant

7.0 Conclusion

Virtual health assistants can provide health information and support on demand and may be used for a variety of purposes in the future, including providing public health information, health education, assisting patients with chronic health conditions, and assisting with healthy lifestyle behaviour change.

Many times, people are afflicted but are unaware of what needs to be done. Instead, they tend to panic and call the hospital right away. As a result, they are unfamiliar with standard first-aid procedures. Our web service will solve this problem by providing step-by-step instructions.

Our web service provides users with online video appointments where they can obtain prescriptions from our specialised doctors and physicians. These users can also get online medicine delivered to their door.

During an emergency, our web service will provide you with the location and phone numbers of nearby medical facilities. This web service employs cutting-edge technology and machine learning algorithms to process the user's data and generate a diet and exercise chart that will assist the user in maintaining a healthy lifestyle.

8.0 References

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