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VIRTUAL HEALTH ASSISTANT

TRANSFORMING VALUE-BASED CARE

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Virtual Health Assistants: Transforming Value Based Care

What is a Virtual Health Assistant ?

Digital virtual health assistants(VHAs), also known as virtual health care assistants, are digital platforms that use artificial intelligence (AI) technology to assist individuals manage their health and wellness. These virtual assistants use natural language processing, machine learning, and other AI-powered technologies to provide a wide range of services.

VHAs are not a substitute for real humans. In fact, VHA's work in conjunction with them. They are an engagement technology that is infused with the knowledge of a specific domain or therapy as interpreted by each client. They are infinitely scalable, thus saving money by handling problems once dedicated to call centers and healthcare professionals. When VHA's can't respond to a question, they are programmed to redirect the user to the person or place that can help them.

Though virtual assistants have gained attention in multiple industries, their main application is in Healthcare Vertical.
- VHAs are being created to improve patient adherence to care plans, and medications, and thus lower cost, reduce adverse or unplanned occurrences and improve consumer satisfaction.
- VHAs are becoming a necessary method for healthcare and life science organizations seeking to improve digital consumer engagement strategies.

# Challenges With Current Healthcare Ecosystem

- There are hassles of long waiting time to schedule an appointment by either visiting a doctor or making a call to the hospital/clinics.
- Providers need to pay more attention to quality and personalized care but most of their time gets consumed in administrative tasks.
- Increased staff inefficiency and less quality outcomes & care.
- The problem in healthcare hospitals or providers organizations are piles of files with multiple efforts needed and huge paperwork involved from documenting down everything that patients say during appointments and recommended diagnosis & treatments, to managing the records of the admitted and discharged patients, to analyzing patients' health records from other doctors.
- The COVID-19 pandemic created havoc and raised the great need to treat people remotely without manual intervention involved.
- Once in our lifetime, we might have googled our symptoms and falsely diagnosed ourselves. Users try to treat themselves by reading the details on Google. However, there may be a problem with the information available on the Internet and it may not be accurate. Few websites contain accurate information that is created for professional

references, but have medical nomenclature and jargon (Example: American Academy of Dermatology) and are hard to understand for the end users.

How Virtual Health Assistants (VHAs) can help ?

Increased use of digital engagement continues across industries and thus increased the need for virtual health assistants. One of the key benefits of digital virtual health assistants is the convenience they offer.

- Few of the main capabilities provided by VHAs are mentioned below:
    - VHAs help in automating routine tasks, render real-time insights into consumers' vitals, activities, behaviors, and attitudinal preferences for more immediate, personalized interventions.
    - Rather than having to visit a healthcare provider in person or call to schedule an appointment, individuals can access a digital virtual health assistant from any location, at any time.
        - This can be particularly useful for those who have mobility issues or live in remote areas.
    - Scheduling doctor's appointments and procedures being prescribed by doctors. Also, an ability for patients to cancel or reschedule those appointments
    - Response and answering any questions that patients might have about their appointments, such as "How should I prepare for my visit?"
    - Make patients understand about post-visit or discharge requirements and about the recovery process.
    - Asking patients about their symptoms in advance which in turn shortens visit times and sharing that information to the doctor.
    - Allowing people with chronic illnesses to renew their prescriptions remotely without visiting a health center.
    - Virtual health assistants can also help to reduce healthcare costs. By providing easy access to information and self-care tools, virtual assistants can help individuals manage their health and avoid unnecessary medical appointments or procedures.Example: Recommendation of preventive services
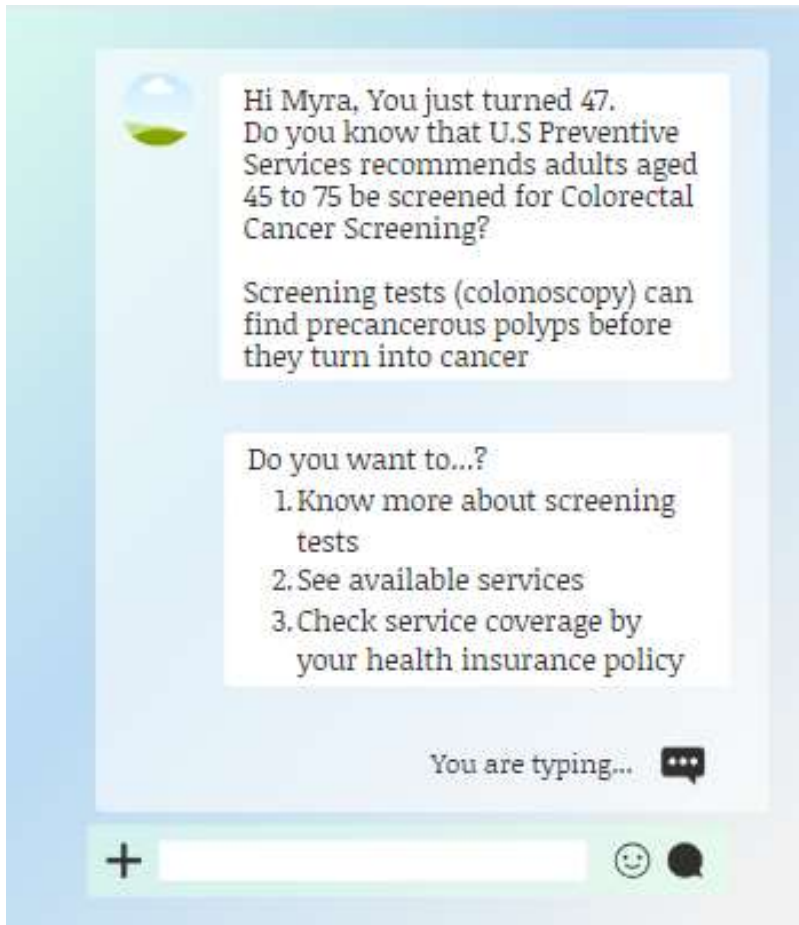
Example of a VHA based on the patient's past medical records and age recommending few screening tests

- The COVID-19 pandemic increased the use of VHAs which turned out to be (literally) a lifesaving technology. They also help to increase consumer engagement and improve the efficiency of the healthcare system.
- VHAs provide user-friendly and accurate information. VHAs also crawl meaningful information through legitimate sources that users may not look into due to Google search results.
- As VHAs mature, they are increasingly able to initiate a conversation and determine moods using sentiment analysis and assist in Digital Cognitive Behavioural Therapies.
- VHAs improve recruitment and retention in clinical trials of patients. They can help extract and analyze appropriate information from a patient's EHR records, compare with eligibility criteria for ongoing trials, and suggest matching investigations.

Components of Virtual Health Assistants

Application of Virtual Health Assistants in Healthcare has rapidly increased and covered many deeper areas to increase the personalized patient engagement experience. The Virtual Health assistants are built of various technology components as mentioned below:
- Robotics to perform or automate any tasks
- Speech recognition to take best actions
- Natural Language Processing to process unstructured data from medical records
- Machine learning and Artificial Intelligence to give best recommendations based on health conditions
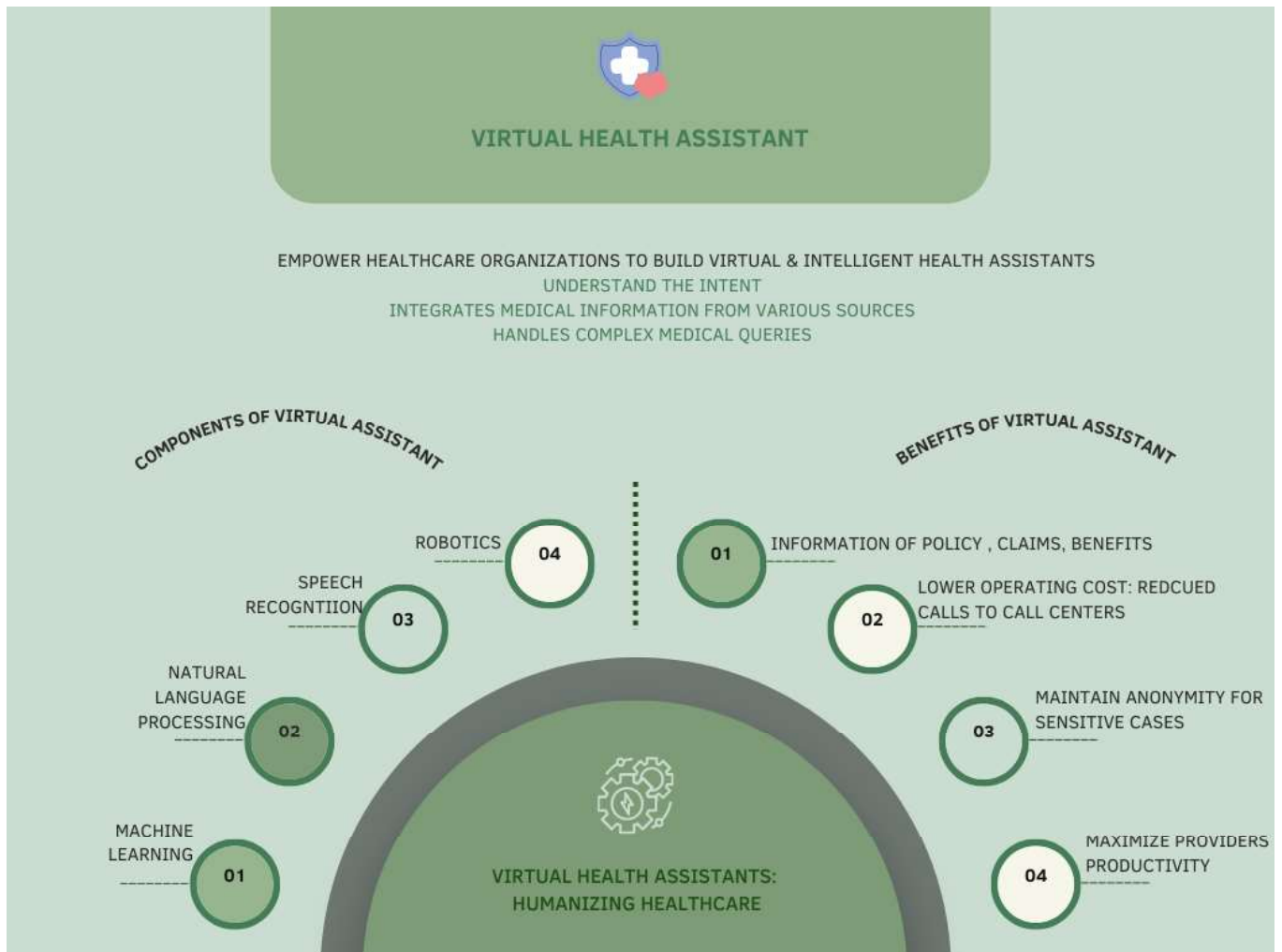
Obstacles in implementing VHAs

Most of our Healthcare and Lifesciences organizations lag digital
maturity in consumer experience capabilities when compared to other industries.
To stay in the game and to have digital transformation, many organizations incorporate VHAs
into their multi-experience consumer engagement strategies.

- Data privacy and security are crucial when using these tools as personal information of patients (PHI) needs to be HIPAA compliant.
  - The PHI is the main concern when sharing information through VHAs. Therefore, it's important for individuals to be aware of how their personal information is being used and to ensure that it is being handled securely.
- It is hard and is challenging to orchestrate data across disparate systems. Most of the organizations prioritize their data fabric to ensure employees, users and consumers have access to the right information at the right time to execute informed next best Actions.
- Use of technology, specifically AI algorithms, is getting matured day by day but is not to the point that it can replace humans. We cannot expect immediate productivity from VHAs until the next 3 to 5 years until technology maturity reaches its peak.

Technology Giants and their Preparedness for VHAs

Digital healthcare virtual assistants are used to enhance, improve, restructure overall clinical workflows which in turn helps healthcare staff and providers to manage the administrative tasks more effectively and efficiently.
As per the survey, the healthcare virtual assistant market is expected to grow at a CAGR of 24.7% from 2018 to 2025, and to reach $1.7 billion by 2025. (Source).
Top technology giants have already moved and created an impact in Healthcare Industry Vertical. These giants are trying to encompass every possible space and create value.

- Amazon's Alexa with a Polish speech synthesizer named Ivona, can look after and monitor the user's health as a personal nurse. In case of any emergency, they recommend going to the nearest hospital. (Source)
  - Amazon's Alexa not only could help young generations, but also helps elderly people by working as voice assistants for diabetic patients.
  - It helps aged people with dementia. These devices can keep answering questions the entire day. Even if someone asks any number of questions about the time or weather, Alexa will patiently respond to all of those. It can easily do any of their tasks with a single command.
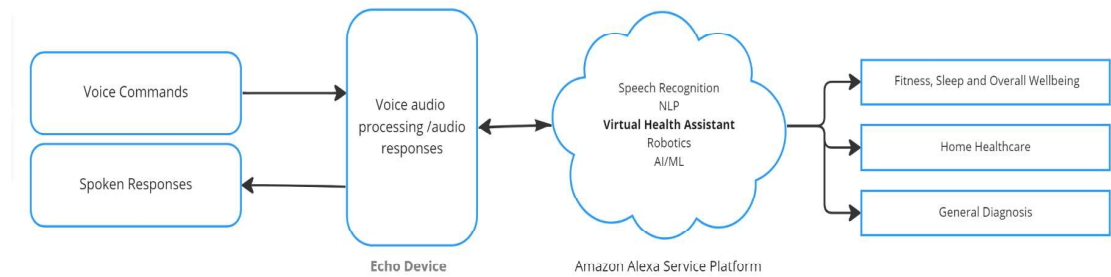
- Babylon Health - Created a COVID-19 Care Assistant which has continually updated information, triage, live chat, symptom tracking, virtual consultation and referrals. This helps with giving simultaneous help to people with questions or concerns, and for whom treatment involves self-isolation, while still giving detailed and thorough care to people who need more intensive attention.
- Virtual Assistant for Home Care by PilloHealth - Dubbed Pria, the bright-eyed Virtual Assistant robot can dispense up to 28 medication doses and uses facial recognition so the kiddies can't steal Grandpa's heart medication. This works as a medication reminder for agedly people. ([Source](#))
- Other Vendors Avaamo, Medocity, Orbita, Pager, Sensely, Verint also created other powerful Virtual Health assistants helping the end consumers as well as complete healthcare domains and subdomains.

Must Have For Good Quality VHAs

- Create personas and journey maps to identify essential end-users high-value use cases for VHAs.
- Actively engage clinicians in user testing and experience design to ensure usability and engagement.
- Construct user conversation (patient to a virtual assistant and vice versa) using AI/ML. Design Interviews to obtain impressions of patients and make improvements in the use of Virtual Assistants
- Understand & implement regional privacy regulations for countries when piloting on live patients. For example, the virtual assistant should store all the medical data in accordance with the Health Level 7 Fast Healthcare Interoperability Resources (FHIR) clinical standard. Securely manage, store, and use PII data following the General Data Protection Regulation (GDPR).

Conclusion

Looking to the future, digital virtual health assistants are expected to play an increasingly important role in the healthcare system. As technology continues to advance, virtual assistants will become more sophisticated and able to provide a wider range of services. The use of virtual health assistants is expected to increase as more people become comfortable with using technology to manage their health. Moreover, they are becoming more affordable and more accessible than ever before.
While it's important to be aware of the ethical concerns, the benefits outweigh the risks. And with the steady growth and development in the field of virtual health, we can expect these assistants to become even more advanced in the future and deliver better healthcare even to the remotest corners of the world.

Reference Links

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About the Authors

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