INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT (IJSREM)
VOLUME: 08 ISSUE: 10 | OCT - 2024 SJIF RATING: 8.448 ISSN: 2582-3930

# AI Virtual Assistants in Human Services: Empowering Customers and Caseworkers

Deepika Rikhi
Austin, Texas
reachdeepikarikhi@gmail.com

***Abstract*—This paper explores the transformative role of AI virtual assistants (VAs) in human services, highlighting their potential to enhance communication, streamline processes, and improve customers' and caseworkers' overall experience. By examining technology applications and challenges, the aim is to comprehensively understand how VAs can empower the human services industry.**

***Keywords*—AI Virtual assistant, Natural language Processing, Machine learning, Caseworker assistant, Customer assistant**

## I. INTRODUCTION

Technology integration in human services has paved the way for innovative solutions that address the needs of clients and caseworkers alike. Virtual assistants powered by artificial intelligence are at the forefront of this evolution. They offer a range of functionalities, from answering queries to assisting in case management, thus reshaping the human services landscape.

The mechanisms that power Virtual assistants are natural language processing (NLP), machine learning, and integrated databases. Virtual assistants need access to the database to answer queries, and an integrated database is used to respond to the questions and provide better assistance. NLP is a branch of artificial intelligence that understands the intent of the human language and is not just limited to matching the keywords. Machine learning (ML) is a subfield of AI that solves problems like humans. It can learn and adapt without explicitly being programmed. ML uses algorithms and statistical models to analyze and draw inferences from the data, e.g., Deep neural networks, Linear regression, Decision trees, etc.

## II. AI VIRTUAL ASSISTANTS IN HUMAN SERVICES

Social agencies have limited resources, and it is challenging to provide one-on-one assistance to each client at the time of application submission and throughout the life cycle he is receiving benefits. Thanks to AI, virtual assistants can fill the gap and assist clients in many functions when and where they need it.

Similar caseworkers need to be constantly trained on evolving policies and procedures. Besides that, social agencies are moving to a no-wrong-door policy to assist clients efficiently. This adds to the caseworker challenge to process integrated applications (i.e., a single application for multiple programs)

Following are some high-level use cases that can be implemented to help the client and caseworker.


*Fig 1: Application of AI Virtual Assistant in Human Services*

### *A. Eligibility Screening*

Before the client applies, the bot can assist the client in checking which program he might be eligible for based on his current circumstances. Clients do not have to fill out lengthy applications and wait for days to know what

they and their families might not qualify for a given program. This is not the final determination, but high-level screening will assist the client to know if there is a probability for him receiving the social benefit/s.

Virtual assistants can be trained in high-level rules related to income, residency, household, medical situation, etc. The client can submit this information via interaction with the Virtual assistant, and the Virtual assistant, based on the configured machine learning models, provides probable eligibility to the client and recommends that the client apply for the program to get a final eligibility determination based on a detailed review of the Client and his household situation.

### *B. Application completeness check*

Application completeness checks assisted via Virtual assistant will help social agencies proactively manage the application processing timeline.

Configuring the mandatory information while designing online application submissions is a standard practice. Although conditionally mandatory information is not always configured in the application, it can also change with policy change.

The virtual assistant can be trained based on conditionally required information. For example, if the client submits income information, income documents (like a paystub) must be submitted with the application. The virtual assistant can assist the client and social agency in completing the application in the first instance. If the client submits all the required information, it can be processed timely.

When a client submits a paper application, it is challenging to evaluate the completeness manually. In that case, the Virtual Assistant can be configured in the system of records so that when the caseworker enters the information, the Virtual Assistant assists him in determining what information is missing and needs to be requested from the client.

### *C. Application accuracy check*

The virtual assistant can also help ensure that the information entered is accurate across all the application sections. The Virtual Assistant will alert the client/caseworker if there is any mismatch in the information submitted by the client. For example, the utility expenses period should match the information on the living arrangement submitted by the client.

These soft rules can be used to train virtual assistants, and data should be reviewed and updated as rules and regulations change.

### *D. Client's Coach*

Once the application is submitted, a Virtual assistant as the Client's coach or copilot can assist the client in evaluating his path based on the changes in circumstances (COC).

For instance, if income increases or there is a change in medical care, such as moving out of long-term care or moving in, the virtual assistant can assist the client in determining what social assistance is available for them to manage the new situation.

A virtual assistant can be trained with COC processes within social agencies and at high-level information across state agencies. It can be configured to assist citizens more effectively in choosing the right path.

### *E. Caseworker Trainer*

Processing an integrated application, renewal, and change of circumstances, which can lead to over or underpayment, requires in-depth knowledge of the processes and procedures. And knowing everything is practical not possible. Usually, caseworkers refer to the training material and consult the supervisor while working on the case, which adds to the processing time.

Virtual assistants can be trained using the training manuals and policies. They can then assist the caseworker in real-time and guide them in what steps to take explicitly based on respective case data. This also increases the caseworker's confidence, and they are more likely to consult the Virtual assistant instead of their supervisor.

Virtual assistants can also be trained to proactively address common errors identified during quality checks. This will help reduce the case error rate.

For instance, if income verification is an area where most of the errors occur, then as soon as the caseworker verifies the mandatory income verification and approves it, he should get a message from the bot showing the steps that needed to be done for the end-to-end income verification and checking from all the sources (as

expected by QC/QA) and request caseworker to confirm if he followed the given steps.

*F. FAQs Assistance*

One of the most common but effective use cases is assisting the caseworker and client with frequently asked questions. For instance, how can I submit a SNAP application? What other programs can I apply for? Can I submit multiple program applications at the same time? When should I submit the verification document for timely processing? Etc.

Virtual assistants can be trained to enhance customer support based on queries received by the call center. Similarly, from a caseworker's perspective, a Virtual Assistant can be trained based on the questions received by the help desk.

*G. Navigation assistance*

One of the common challenges that a caseworker and a client face is navigating the system or website. Virtual assistants can assist the client and caseworker in navigating and reducing clicks. For instance, when or how to submit the verification, the Virtual Assistant can provide the link to the respective verification page where the client can upload the documents.

Similarly, a system of record can be complex, and navigating from one page to another may require multiple clicks. Virtual assistants can save caseworkers time by providing a direct link to the page when asked.

*H. Task Manager*

Virtual assistant/Virtual assistant can help users manage caseworker tasks efficiently. A virtual assistant can be configured to welcome the caseworker when he logs in and remind him of the last work he was doing, which is incomplete, and other pending work items that he may not have completed yet.

Virtual assistants can be trained to prioritize the work for caseworkers based on processing time rules.

## III. THE CHALLENGES

Social agencies face challenges while implementing AI virtual assistants. Some of the common challenges are covered here.

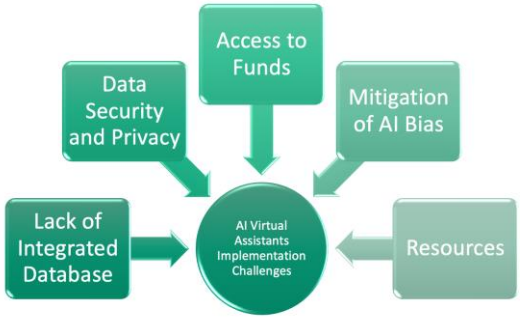


*Fig 2: AI Virtual Assistant Implementation Challenges*

*A. Lack of Integrated Database*

The integrated database is critical for the Virtual assistant to work most efficiently. Social agencies may work across multiple systems, e.g., a Workload management system, an Eligibility determination system (could be more than one based on programs), a Document management system, etc. And data is not always integrated across the system. The complexity and cost of the integration is also very high.

A lack of integrated data may create a fragmented and frustrating user experience.

*B. Data Security and Privacy*

Human services often handle sensitive personal information. Ensuring that Virtual assistants comply with regulations like HIPAA (in the U.S.) can require significant resources and investment in secure technology.

Developing policies that govern the use of Virtual assistants in human services is crucial but can be resource-intensive. Social agencies may face challenges in creating comprehensive policies that address ethical considerations, data security, and user privacy.

*C. Access to Funds*

Many human services organizations operate on tight budgets, making it challenging to allocate funds to develop and maintain Virtual assistant technologies. Limited financial resources may lead to underfunded projects or the inability to afford necessary updates and improvements.

Securing grants for innovative projects like Virtual assistants can be competitive, and social agencies may struggle to effectively demonstrate their potential impact

on service delivery. This can hinder their ability to access the funds needed for implementation.

### *D. Mitigation of AI bias*

AI bias is systematic and unfair discrimination from algorithms trained on skewed or unrepresentative data. This bias can manifest in various ways in human services, impacting how services are delivered to different demographic groups. Bias can originate from historical data reflecting past inequalities, imbalanced datasets underrepresenting specific populations, or flawed assumptions made during the Virtual assistant's design. For instance, if a Virtual assistant is trained primarily on data from one demographic, it may not respond appropriately to users from different backgrounds.

### *E. Resources*

Implementing a Virtual assistant requires a skilled team for design, development, and ongoing management. Many human services organizations may lack the necessary personnel with expertise in AI and technology, leading to insufficient resource allocation.

Staff in human services may need training to use and manage Virtual assistant systems effectively. Allocating time and funds for training can be a significant barrier, especially in environments where staff are already overwhelmed with their existing responsibilities.

For Virtual assistants to function effectively, robust technological infrastructure is required, including servers, software licenses, and reliable internet access. Many human services organizations may not have the necessary infrastructure, and arranging it can take months.

## IV. FUTURE TRENDS

The future of virtual assistance is poised for significant evolution, driven by advancements in artificial intelligence, natural language processing, and machine learning. We can expect more personalized and context-aware interactions, allowing virtual assistants to anticipate user needs and provide tailored responses. Integration with Internet of Things (IoT) devices will enable seamless control of smart environments, enhancing convenience and efficiency. Moreover, developing transparent and secure virtual assistance technologies will be crucial as ethical considerations and data privacy become increasingly important. Enhanced multilingual capabilities and emotional intelligence will further bridge communication gaps, making these tools more accessible and effective across diverse populations.

The future of virtual assistance promises to deliver more intuitive, responsive, and user-centric experiences, fundamentally reshaping how individuals and businesses interact with technology.

## V. CONCLUSION

Virtual assistants can transform the landscape of human services by enhancing communication, streamlining processes, and improving customer support. This technology empowers customers by providing instant access to information and services, reducing wait times, and enabling self-service options. For caseworkers, they can automate routine tasks, allowing more time for direct engagement with clients and complex case management.

Despite the challenges, the potential benefits of integrating chatbots into human services are profound. To fully realize this potential, stakeholders must prioritize securing funding, fostering collaboration, and investing in training and infrastructure. By addressing these challenges proactively, human services can leverage VA technology to create more responsive, efficient, and equitable service environments, ultimately improving outcomes for the individuals and communities they serve.

## REFERENCES

The following are the references used for this paper:

[1] Machine Learning, Explained (April 21, 2021) https://mitsloan.mit.edu/ideas-made-to-matter/machine-learning-explained

[2] AI-augmented human services (2017) chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www2.deloitte.com/content/dam/insights/us/articles/4152_AI-human-services/4152_AI-human-services.pdf

[3] Future of Virtual assistants (October 13, 2023) https://yellow.ai/blog/future-of-Virtual assistants/