AN ANALYTICAL SURVEY ON CONVERSATIONAL AI FOR THERAPEUTIC SESSIONS

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ABSTRACT

Recent advancements in conversational AI have enabled the development of therapeutic sessions that can be delivered through chatbots. The therapeutic potential of conversational AI lies in its ability to provide personalized and engaging content. By engaging with users in a conversation, conversational AI can better understand their needs and provide them with customized content that is relevant to their situation. In addition, conversational AI can provide a more engaging and interactive experience than traditional therapies, which can help to motivate and sustain users' engagement in the therapy. This paper discusses the potential of using conversational AI for therapeutic sessions, specifically in terms of its ability to provide personalized and engaging content, while also exploring the ethical considerations of using conversational AI for therapeutic sessions

Keywords: *Artificial Intelligence, Machine Learning, Natural Language Processing, Large Language Models, Conversational Design.*

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1. INTRODUCTION

Doctors, especially mental health specialists, frequently start and maintain a good rapport and conversation with their patients. This engagement helps establish the patient-doctor relationship, which further helps the doctor in providing diagnosis and treatment to the patient. In most regular forms of psychotherapy, this conversational relationship involves one singular patient and one doctor [1].

While fostering this one-on-one relationship is extremely beneficial for the patient, it turns out that there is a severe shortage of mental health professionals in the world. As our world sinks deep into inequality (hastened by global catastrophes like war and epidemics), this scarcity of therapists is making mental health and therapy inaccessible to the masses who need it.

To solve this scarcity, software algorithms that can engage in human-like conversations (like chatbots, virtual assistants, and conversational AI agents) can be used to provide mental health care to the people who need it [2]. These AI agents can collect diagnosis information, [3], [4] implement evidence-based psychotherapeutic interventions, [5]–[7] and on detecting it, also escalate situations to the relevant emergency services instantly.

Until now, conversational AI agents are not at a level of technical sophistication where they can come in and actively replace human therapists. But it is advanced enough to collect data, hold conversations, and follow instructions, which makes it a leading contender to have significant impact on mental health treatments, especially when done at scale. By utilizing Large Language Models (LLMs) we can create and maintain custom personas to

implement therapeutic practices with patients without the need for excessive human intervention, and thus provide mental health services at scale. There are various open-source and closed-source LLMs available that can be used for this purpose, and fine-tuning these models is not a labor-intensive task.

In fact, if not actual fine-tuning, most models can be easily customized to create conversational AI agents just by appending various different zero-shot and many-shot pre-texts to its processing instructions. These agents usually stick to their given instructions, and are more accurate with more pretext examples provided to it in the prompt.

All in all, using AI in mental health care is still at a nascent stage, and deploying AI agents for mental health diagnosis and treatments will have to come as a seamless integration or extension of existing mental health services and methodologies. While the AI will be used and fine-tuned by these mental health practitioners for their patients, the nature, interface, and extent of use is still unknown and undefined. Only further research and experimentation can uncover the answer to this posed question.

2. RELATED WORKS

Bhugra D, et al.'s Lancet Psychiatry and Stone P, et al.'s Artificial Intelligence and life in 2030 conveys that various different experts in the fields of AI, clinical therapy, and administrators realized that we need to consider trust and safety as paramount when designing and deploying new AI-led technologies [8], [9]. In fact, Patel V, et al. talks about the benefits of tech-enabled mental health care, but also warns that taking away the human element from therapy might also reduce its efficacy [10]. To deal with this issue, we implement careful conversational design and chat parameters to make sure that the AI agents interact with their patients with outmost empathy and coherence.

Adding to that, Kazdin A expedites about how limited access to mental health treatment has created demand for scalable, repeatable solutions [11], [12]. With mental health treatment being both heavy financially, and human resource intensive [13], [14]. AI might just be the innovation that the mental health industry needs, because it has the inherent potential to address this shortage of mental health professionals. AI is not limited by the constraints of time or attention span hence it can also solve for the skewed incentives of clinical care; while therapists value conversations and deep, intimate talks, there is no financial incentive present to prompt them to always engage in significantly lengthy and meaningful conversations [15].

Reducing the amount of time spent having conversations with patients only makes the problem worse. Talk therapy usage has been consistently declining, mostly due to the incentive problem mentioned before, and a severe shortage of trained professionals to undertake the practice. This means that fewer and fewer patients have access to talk therapy during psychotherapeutic sessions [16]. Hence, when you compare a conversational AI agent to a human therapist, you find that the AI agent can be utilized almost infinitely at maximum scale. This makes it a very attractive and viable alternative to human therapists. In the case of conversational AI agents becoming more accepted by both mental health patients and their caregivers, it will most surely solve the mental health accessibility problems that plague the sector today, including improving accessibility amongst third world societies where mental health issues and seeking mental health assistance is deemed taboo [17].

Now that we have identified technology as the way to progress therapeutic services, [10], [18] we should mention that mental health professionals have already been using text-based services to provide mental health help [19]. This showcases a form of willingness on the part of both doctors and patients to embrace and test these new innovations in patient-doctor interactions, with varying (usually increasing) order of quality and novelty. To put it into perspective, progress made in computer science—like NLP (natural language processing) and ML (machine learning)—is actively being used to build language pattern analyzers to figure out how text-based solutions work in times of crisis [20], [21].

In the chance that conversational AI can implement and support therapeutic relationships, therapy will no longer be constrained by the limits of a therapist's time, attention, and energy. Laying down the foundation for therapeutic context with patients, by the use of conversational AI immensely benefits both caregivers and patients. Letting AI agents handle the grunt work of doing repetitive tasks that consume time helps free up the therapist's valuable time and skill that can be redirected to help more patients [22]. By creating an environment where therapists are not burdened by meaningless repetitive tasks, we can protect them from burnouts and also increase their overall job satisfaction as a therapist [23].

3. PROPOSED MODEL

After careful and effective analysis of the previous researches on this topic, a framework is achieved as shown in the figure given below. In the proposed system, we are using LLMs (Large Language Models) to Understand and Generate replies to human responses. The LLM processes the data through a dialog management layer, which ensures coherence of the conversation by using NLU and NLG techniques. The layer functions by matching the user context with relevant data, understands it, and then generates a suitable and conversational reply to it.

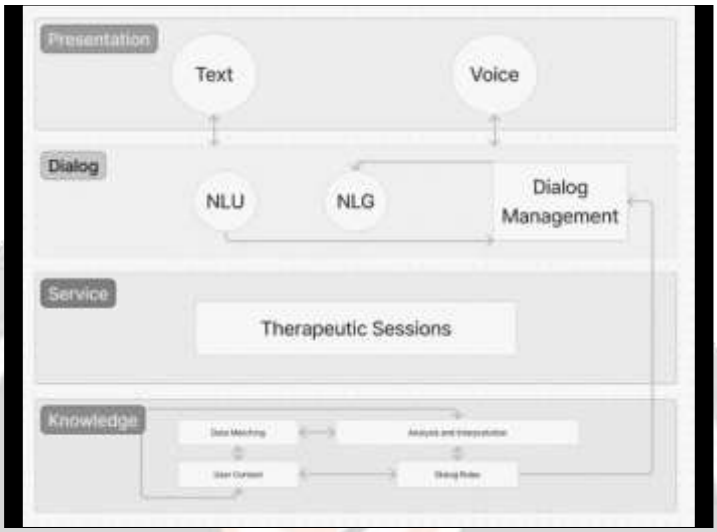

Fig -1: Proposed Model

By using this proposed model, it becomes possible to build a cutting-edge conversational AI agent which is capable of performing and implementing various therapeutic techniques. Additionally, having a well-thought-out conversational design flow in the agent makes it easier for potential patients to engage and talk about their feelings.

Another feature that can be considered is an escalation module. By having an in-built automatic escalation module, patients can stay protected from any unfortunate actions that they might take can, as the module can alert suitable authorities during events where the texts dictate that the patient is suffering from severe distress and is at risk. This is monumental as it will help save lives.

4. CONCLUSION AND FUTURE SCOPE

Conversational AI is still in its early stages, but it has great potential to improve therapy. Using AI, we can enable conversational analysis to help therapists understand their patients better and get a better understanding of their thoughts, feelings, and experiences.

AI can help therapists provide therapy at scale, while reducing costs, thereby making therapy more accessible to everyone. Since AI agents do not suffer from fatigue or sleep, nor do they need holidays (except for server down-times), it ensures that therapeutic services are available 24/7 to its patients, all year round. If trained on the right datasets, models can also avoid patterns and can become relatively more unbiased compared to a human therapist. And unlike a human therapist, an AI's memory states are stored on a database, hence the AI will never forget anything said by the patient.

All of these benefits enable therapists to provide their patients customized treatment plans by understanding a patient's specific needs. Along with that, additional support for patients outside of therapy sessions can also be provided with AI. Patients could get the support they need when they need it, without having to wait for a therapy session.

But before we implement such forms of AI-integrated mental health treatment modes, we must think deeply about the changes, both technical and operational, that need to be made to make sure that the solution fits with and does not conflict the existing context present with the medical professional. This approach will make sure that adoption for AI solutions in mental health sector will be as easy and seamless as possible.

Before we insert new devices into clinical care, it will be crucial to engage clinicians and design evaluation strategies that appreciate the skills, attitudes, and knowledge of affected workers. Just as we can't expect technology companies to easily understand healthcare, we can't expect medical professionals to intuit or work in harmony with new technology without thoughtful design and training.

5. REFERENCES

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