The Emergence of AI in the Mental Health Industry

A Whitepaper on Mental Health Virtual Agents

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As a result of the COVID-19 pandemic, Canadians have been grappling with new levels of stress, grief, and isolation. According to the Canadian Mental Health Association (CMHA), 77% of adults in Canada are reporting feeling negative emotions as a result of the COVID-19 pandemic[1] , thus emphasizing the need for accessible mental health resources. Although telehealth and virtual therapy have provided great options, the rising demand has placed an undue burden on these services with 1 in 10 people having to wait roughly 4 months before receiving treatment from community counselling services[2]. This has presented the need for a more immediate response to cater to these rising demands.

Virtual Mental Health Services

Virtual or conversational agents are an innovative solution to providing people with various forms of mental health services. Some capabilities include therapeutic purposes, training, self-management, counselling, screening and diagnosis[3]. Virtual Agents with these capabilities have been able to aid mental health patients using industry techniques such as counselling, and cognitive behavioural therapy (CBT), among many others[3]. Not only could this alleviate many of the small and repetitive tasks of healthcare workers, but it can also open up a digital resource that can be applied for remote locations or for those without ample access to mental healthcare or the resources to pay for professional counselling.

Woebot Health:

The industry first saw the true power of mental health chatbots with the arrival of the 2017 Woebot (Figure 1). This chatbot was the first AI to target this type of healthcare, assisting patients and clinicians to monitor the moods of users by utilizing the versatility of Natural Language Understanding (NLU) with comprehensive clinical knowledge. Woebot

Figure 1. Woebot Health Interface Example

uses CBT specifically to treat and care for those with mood disorders, stress and anxiety. In a [review](#)of the product by Dr. Dillon Browne[4], he remarked that the bot easily identified the moods he was in when conversing with it and was able to provide helpful advice or guidance on how to cope with those. However, he pointed out that despite these great qualities, Woebot was still sounding scripted and was unable to understand his more nuanced concerns[4]. Of course, this seemed not to hinder the process for many who used Woebot, as one of the factors to why it was so well received was the transparency Woebot established, reminding users of its limitations as an AI[5].

Thriveport:

The year 2017 also saw the arrival of another chatbot company, [Thriveport](#), with their two products: [Moodkit](#), and [Moodnotes](#) (Figure 2). The former uses CBT to suggest steps to improve mental health and promote self-awareness of feelings and emotions, while the latter focuses on tracking and journaling daily emotions to provoke reflection and review patterns.
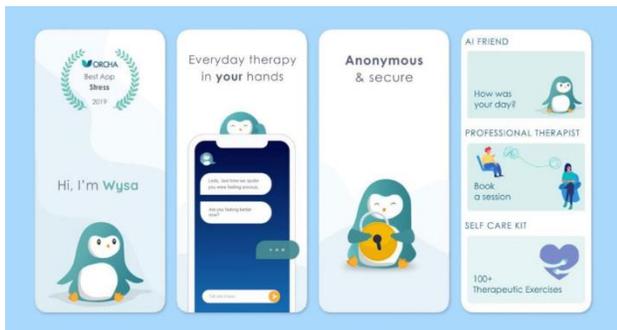

Figure 2. Moodnotes Interface Example

Wysa:

Lastly, [Wysa](#) (Figure 3) came into the market with its emotionally intelligent chatbot, which aided in managing thoughts and emotions through Dialectical Behavior Therapy (DBT), CBT, and guided meditation. According to Dr. Dillon Browne's 2020 [review](#), he found the chatbot to be user-friendly and easy to use, but similar to Woebot, sounded scripted and not very self-aware. In addition, the review covered opinions from a guest, Meredith Arthur, who found that the application was unable to truly understand her anxious mind, not picking up on when it was being too pestering.

Figure 3. Wysa Interface Example

These chatbots outline the importance of clinical backing and emotional understanding in order to succeed and deliver satisfactory user experiences. However, the scripted nature of these bots and the lack of personality to make users comfortable when chatting with them have limited their potential thus far.

How Modern Mental Health Support Chatbots Work

Virtual Agents (VAs) have greatly improved their usability and ability to provide mental health support over the years. These VAs often use ongoing client engagement to improve understanding and formulate their responses to users over longer periods of engagement. In a 2020 data analysis study of a mental health delivery VA called Vitalk, the anxiety, depression and stress levels of participants were evaluated throughout the 90-day program[6]. By the end of the study, it was found that all three levels decreased, including an increased improvement in anxiety and depression values for those who engaged with the chatbots more often. Similarly, a study conducted on Popbots, a group of chatbots that specialized in different cognitive and behavioural intervention methods (Figure 4), found that 81% of the participants scored Popbots high in efficiency[7]. In addition, similar to the Vitalk findings, the group of participants who used the VAs more frequently, had a greater reduction in symptoms than the group of participants who used them less[7].

Figure 4. PopBots Interface Example

Chatbots VS Humans

Though mental health VAs are not capable of providing full mental health services, the immediate and private access to helpful information, especially in a time of crisis, may prove to be a favourable supplement to in-person, or even remote, client- provider interactions. A 2014 study showed that participants found greater ease disclosing personal information to an AI therapist rather than to a human therapist [8]. One potential reason for this finding is the perceived privacy of AI. In a similar vein, the PopBots study showed that approximately half of the participants found some topics to be too personal to discuss with friends and family, but they were open to talking to VAs because of the perceived privacy they provide[7]. The notion that no "human" was behind the voice or words of a digital therapist, made some clients feel more at ease since their discussions did not involve personal disclosure and the perception of judgement. Mental health VAs thus open the door to a more comfortable environment for clients to speak their minds, providing a great benefit for talk therapy efficiency.

Moving Forward…

The industry is adapting new and innovative capabilities that are expanding the potential for Virtual Agents, and more specifically, for emotionally intelligent virtual assistants that can tailor interactions for specific individuals. Every person is unique and has different preferences in terms of conversation style, personal values and other elements of engagement. Providers are delivering VAs that can adapt automatically to user engagement and allow the VA to develop a "personality" that is 'tuned' to support on interactions with particular users.

In 2021, Gartner® released new research, "Technology Opportunity Prism: Emotion AI Technologies", that outlines the Technology Opportunity Prism for Emotion AI (Figure 5)[9]. "Opportunities that fall into the far left area of the prism have potential to deliver high business value due to a game-changing type of technology or approach. We do not see any opportunities that qualify as clear cutting edge; however, there are three that come close to it: empathic avatar, emotional nursebot, outbound agent-client matching and depression detection."[9] Emotion AI VAs are making an entrance into the healthcare industry as healthcare providers seek to provide greater access to services using these innovative technologies. The care they provide can be empathetic, private, accessible, affordable, and can, in certain areas, match the efficacy of trained healthcare personnel for routine cases. Thus, the use of Emotion AI VAs can augment the care provided by healthcare professionals and help close some of the existing gaps seen in our healthcare system.

Figure 5. Gartner Emotion AI Technology Prism

Mental Health Virtual Agents are still in the midst of their growth and evolution, but study findings are highly encouraging; there is great potential here. The future of augmented human & digital mental health delivery presents distinct opportunities as we continue to navigate these largely uncharted waters. More so, the ability to affect real change, improve well-being, and even save lives, based on the immediacy of care and the removal of some privacy and interaction concerns has substantial societal benefits that should not be underestimated.

References

[1]CMHA. (2021, May 3). *How are we feeling? Canadians are worried, bored, stressed, lonely and sad*. Canadian Mental Health Association. https://cmha.ca/how-are-we-feeling-canadians-are-worried-bored-stressed-lonely-and-sad/

[2]CIHI. (2021, May 26). *1 in 10 Canadians wait 4 months or more before receiving community mental health counselling*. Canadian Institute for Health Information. https://www.cihi.ca/en/1-in-10-canadians-wait-4-months-or-more-before-receiving-community-mental-health-counselling

[3]Abd-Alrazaq, A. A., Alajlani, M., Ali, N., Denecke, K., Bewick, B. M., & Househ, M. (2021). Perceptions and opinions of patients about mental health chatbots: Scoping review. *Journal of Medical Internet Research, 23*(1). https://doi.org/10.2196/17828

[4]Browne, D. (2020, June 26). *Do Mental Health Chatbots Work?*. Healthline. https://www.healthline.com/health/mental-health/chatbots-reviews

[5]Darcy, A., Daniels, J., Salinger, D., Wicks, P., & Robinson, A. (2021). Evidence of Human-Level Bonds Established With a Digital Conversational Agent: Cross-sectional, Retrospective Observational Study. *JMIR Formative Research, 5.(*5). https://doi.org/10.2196/27868

[6]Daley, K., Hungerbuehler, I., Cavanagh, K., Claro, H. G., Swinton, P. A., & Kapps, M. (2020). Preliminary evaluation of the engagement and effectiveness of a mental health chatbot. *Frontiers in Digital Health, 2*. https://doi.org/10.3389/fdgth.2020.576361

[7]Mauriello, M. L., Tantivasadakarn, N., Mora-Mendoza, M. A., Lincoln, E. T., Hon, G., Nowruzi, P., Simon, D., Hansen, L., Goenawan, N. H., Kim, J., Gowda, N., Jurafsky, D., & Paredes, P. E. (2021). A suite of mobile conversational agents for daily stress management (Popbots): Mixed methods exploratory study. *JMIR Formative Research, 5*(9). https://doi.org/10.2196/25294

[8]Lucas, G. M., Gratch, J., King, A., & Morency, L. (2014). It's only a computer: Virtual humans increase willingness to disclose. *Computers in Human Behavior, 37*, 94-100. https://doi.org/10.1016/j.chb.2014.04.043

[9]Gartner, "Technology Opportunity Prism: Emotion AI Technologies", Annette Zimmermann, Alexander Linden, June 15, 2021. GARTNER is a registered trademark and service mark of Gartner, Inc. and/or its affiliates in the U.S. and internationally and is used herein with permission. All rights reserved.

In Summary:

- The need for mental health resources have increased; emotionally intelligent VAs can provide an alternative or addition to in-person services
- Services like Woebot, Thriveport, and Wysa have paved the way for mental health chatbots which use industry standard techniques to provide mental health help
- Mental health VAs have been found to be efficient in aiding people with Depression and Anxiety
- The opportunities for mental health VAs only grow with the emerging Emotion AI technology

About kama.ai and the kama DEI Solution

kama.ai is the creator of the Designed Emotional Intelligence® platform kama DEI that allows curated information to be rated and distributed through a conversational agent based on personality value profiles. This allows a level of personalization between the consumer and an enterprise's product and service information that has not been achieved previously. The result is an automated consumer engagement service that works around the clock to address consumer inquiries with the right information, for the right reasons, for each customer.

kama DEI has an underlying knowledge base that unifies common information and a 'zero code' Enterprise Portal that allows non-technical users to curate and rate product and service information in simple natural language methods. The platform also allows for the setup of various target market demographic profiles (kama DEI 'Personas') to form the basis for various consumer/customer personality types.

kama.ai also offers a rapid launch front-end chatbot that can be configured and integrated within hours to your enterprise's web and mobile web pages. As an alternative, the kama DEI omni-channel chat API allows for integration to a current chat facility that you already have, integration to live-chat, and it can also power other channels such as FB Messenger, smart-speakers, or mobile phone applications.

For more information on kama DEI, please chat with "Kady" or fill out an inquiry form on our website.