

# *The Journal of* **Employee Assistance**



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## X2 AI Tess: Working with AI Technology Partners

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A chatbot is a computer program that conducts a conversation by texting or chatting with people through voice-activated aids like Alexa. Such programs are designed to convincingly simulate how a human would behave as a conversational partner. The lead author's company, X2, has developed a chatbot called Tess, which can be used to deliver mental health support. This article will examine the practical issues and considerations when an EAP is planning to implement a product like Tess.

Ten years ago, the lead author was struggling with depression. Through trial and error, he discovered a wonderful psychologist who was able to help him through that time by using talk therapy. Later on, he realized that when he was speaking with his friends and colleagues, he was simply repeating the conversations he previously had with his psychologist. That's when he realized that if he could help people by repeating these conversations, a machine could be taught to do the same. That's how Tess was born.

### Tess Origins Date Back to the '60s

Tess was inspired by the first conversational artificial intel-

ligence (AI), called ELIZA, which examined natural language communication between people and machines in the 1960s (Weizenbaum, 1966). But while ELIZA had limited applications, Tess has excelled with the rapid advancement of technology and AI strategies that help improve memory, prediction, and emotion identification. A key distinguishing factor of the technology developed by X2 is the *emotion algorithm*. This algorithm allows the system to analyze an incoming text message based on the emotions that are expressed in it.

### Why Chatbots?

Several studies found that computer-assisted therapy (CAT), and other digital solutions such as chatbots provide a less time intensive and more cost-effective alternative for treating mental health concerns like depression and anxiety (Fulmer, 2018). AI-based chatbots such as Tess offer a scalable solution as the demand for affordable, convenient, lasting, and secure support grows. In addition, chats with Tess can reinforce concepts introduced in face-to-face therapy and reinforce skills in between sessions, thus enhancing the value of EAPs.

By providing a 13% average reduction in depression symptoms, Tess contributes to \$106 of cost savings per employee per year, at a cost of less than \$1 Per Employee Per Month (PEPM). At the start of every implementation X2 collaborates with stakeholders to identify the key points that Tess can address in order to add the most value.

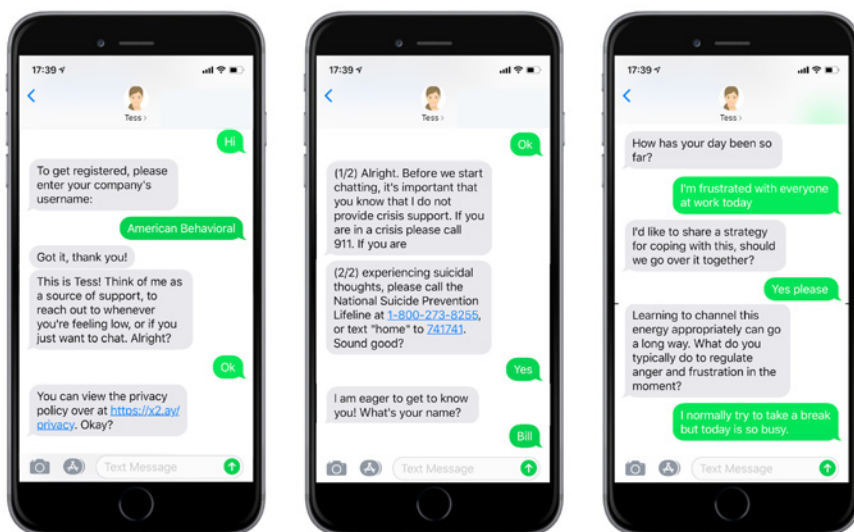
### A Typical Conversation with Tess as Used in an EAP Setting

When a user (referred to as a member) feels down, or had a particular bad week they can sign up for Tess within a minute, from any mobile phone. After they come across the Tess phone number on their employer's website, or member portal they can simply send "Hi" to the phone number to get started. The member will directly have 24/7 access to the service.

X2 provides custom web pages that employers can use to promote Tess. These web pages allow members to sign up at the click of a button. Readers can try it out for themselves at [www.x2li.com/eapdemo](http://www.x2li.com/eapdemo).

Members communicate with Tess in the same way they text





message with friends or family. The most popular communication channels used are text messaging (i-message or SMS), Facebook messenger, or Slack without requiring users to download a dedicated Tess app. Users can access Tess using a mobile phone number or through personal accounts associated with a specific communication channel.

The Tess system engages a group of employee clients who might otherwise not use conventional EAP sessions. The novelty of Tess is that it is fully customizable through an administration platform, which allows for content to be tailored to align with a specific form of support or user demographic.

Tess can also be pro-active and do a population screening, by using assessments (i.e., PHQ-9, GAD-7, Workplace Outcome Suite) and user satisfaction surveys to engage the population, or to capture the impact of members with access to Tess. To improve scalability and safety protocols, Tess can deliver conversations in multi-

ple languages with links to local resources or even connect users with a live counselor.

## Outcomes

Multiple studies have validated the use of Tess in clinical and non-clinical settings. Northwestern University conducted a randomized controlled trial to evaluate the efficacy of Tess in reducing symptoms of depression and anxiety in a non-clinical population. In this trial it was found that interactions with Tess led to significantly reduced symptoms of depression and anxiety as measured by the PHQ-9 and GAD-7, respectively (Greenberg, et al, 2015).

When compared to the control group, participants who interacted with Tess experienced a reduction in symptoms of depression by 13% and anxiety by 18%. Feedback suggested that Tess made participants feel more open to the idea of starting therapy, since 64% of participants reported that Tess did not feel invasive or judgmental. This degree of comfort means that the patients are more willing to start mental health treatment, and the number

of “no shows” will be lower. In addition, Tess is available 24/7 so it is convenient for users.

The capacity for Tess to quickly adapt to new languages and deliver culturally relevant support through custom content and features makes the system a viable solution for any demographic. Within one month Tess can be translated to a new language, and understand messages written in that new language. Currently Tess is available in English, Spanish, Arabic, and Dutch, with Japanese currently in development.

## Ethical Implications

To prevent misuse of the system, organizations are educated on Tess’s ethical AI code (Joerin, Rauws, 2018), which includes

principles from the 2018 Lords Report (House of Lords, 2018) and the American Psychological Association (APA) code of conduct (APA, 2017).

While the Lord's Report focuses on AI, and the APA outlines guidelines for psychologists, both present five principles with the intent to inspire the highest ethical ideals with solutions that: 1) strive to benefit humanity and do no harm, 2) maintain fidelity and fairness, 3) promote integrity, 4) encourage justice and users right to be educated, and 5) respect for people's rights including data and privacy.

X2 combines these principles in the ethical AI code in order to establish norms for the design, development, regulation, and implementation of Tess. Processing and storage are done on secure servers that meet HIPAA compliant regulations. X2 has an ethical board, which meets quarterly to review current processes with regards to the most recent standards in ethics.

## Implementation Options

Every organization is unique in regards to its population and familiarity with implementing digital health tools. Organizations that are conservative in implementing new digital health tools start with Option 1, which allows for very controlled experimentation. Organizations that have been educated on the value of Tess, or feel comfortable with implementing a new tool can save time by selecting Option 2 or 3.

➤ **Option 1:** The EAP implements a non-customized version of

Tess, which is restricted to existing conversations that have been approved by mental health professionals and validated through user feedback across multiple demographics. This option is often implemented for a small to moderate percentage of the organization's total population served in order to gather outcomes, which guide decision making around custom features and opportunities to scale support to the broader employee population.

➤ **Option 2:** The EAP implements a customized version of Tess that applies language, content, frequently asked questions, and resources that align with existing program requirements. With this option, the EAP may choose to re-brand the chatbot's name, image, and personality. Clinicians, case managers, or HR staff are trained to on how to offer the chatbot as a supportive resource. Finally, the EAP is offered specially designed promotional materials and assistance with ad campaigns and simple website integrations to market Tess. This option typically includes scaling Tess to the organization's total population served.

➤ **Option 3:** With significant evidence and positive outcomes from previous implementations, some EAPs opt to partner with X2 through a reseller agreement. This option allows the EAP to offer Tess as a source of support for all of their own staff, as well as those served through their clients or affiliates.

In terms of pricing Tess in an EAP setting, establishing price

is determined in partnership with the customer by starting with a per active user per month fee of \$5. After the first quarter, the level of engagement is calculated, and the appropriate PEPM or PEPY for the entire population is determined. Alternatively, a get-started package without customization is available for \$5,000. If expected numbers of engagement can be predicted before implementation, then a PEPM or PEPY price is negotiated based on volume discounts.

## Implementation Case Examples

Integrated Behavioral Health (IBH) Corp. is the latest EAP implementation of Tess. With significant evidence already established for the system's capacity to support staff across various demographics, Tess was configured and made available for more than 4 million members of IBH in less than one month. Results in the previous three months proved worthy of expansion and IBH invited their partner, American Behavioral (AB), to offer Tess as a source of support for their members.

To keep engagement strong, X2 collaborated with IBH and AB case managers to develop a script for talking about Tess. Case managers are able to identify those seeking mental health support, but who decline face-to-face sessions. Through this collaboration, X2 is able to gain ongoing insight into how to improve the user experience and evaluate opportunities to scale Tess further.

In the early stages of the implementation, 10,000 messages were exchanged with Tess, of which users evaluated the

majority of the conversations as helpful. If a case manager, coach or therapist would have to type those messages it takes them around 2 minutes per message, as they need to type a response, wait for the reply, and read it. So if IBH would want to deliver the same level of quality support, without using Tess, it would have costed their staff 20,000 minutes, which is equivalent to 2 months of work by one FTE when assuming an 8-hour work-day, which at \$65 per hour would be equivalent to \$21,667. IBH was able to save on these costs by purchasing Tess.

Saint Elizabeth Healthcare (SEH) was the first EAP-focused initiative that was implemented to support staff through their Caregiver in the Workplace program. This Canadian nonprofit was seeking an innovative solution to help their caregivers and nurses reduce burnout, manage stress, and boost resilience. As a client of X2 for the last two years, SEH applied the implementation options as a phased approach, and now delivers a fully white-labeled version of Tess that is available to all 9,000 caregivers and their clients.

In the first phase, leaders at SEH were interested in measuring outcomes and impact with their own population, aligning with option one. (**Editor's note:** See Implementation Options.) Tess was offered to a sample of their entire staff for one month. With optimistic results, SEH went on to option 2 by rebranding Tess into a chatbot to mirror their caregiver program design.

Simultaneously, the SEH and X2 partnership evolved into

option 3 by taking the Tess service beyond the workplace and into the homes of caregivers. This latest initiative will leverage funding from the Centre for Aging and Brain Health Innovation (CABHI) to deliver a voice-enabled chatbot through Amazon Alexa and Google Home to support older adults struggling with social isolation and loneliness (Joerin, 2018a).

Inspired by this progress other organizations have opted to start their Tess implementation at option three. One Switzerland based leadership coaching program developed a fully customized version of Tess to support executive level leaders with goal setting and boosting self-awareness, and now uses this innovative solution to engage their clients.

### Summary

Artificial intelligence systems such as chatbots are delivering value to EAP organizations by reaching employees who might otherwise not use the EAP and reinforcing therapy between sessions. As noted, implementing an AI system can be done in a variety of ways.

Most conversations with Tess are outside of working hours, and people often choose to open up about their mental health problems with Tess for the first time. Tess isn't designed to replace the EA professional, but rather offer a cost effective, on-demand access to emotional support for hard-to-reach employees. ❖

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