

# Innovating the Next Generation of Smart Speakers Using AI

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Q x TKS





# EXECUTIVE SUMMARY

## Problem

Amazon is missing out on a substantial revenue stream from the Gen Z demographic, amounting to a staggering \$833 million due to its failure to incorporate generative AI technology into its platform.

- Only 27% of Gen Z Amazon Prime Subscribers Own an Alexa.
- 69% of Gen Z are concerned with privacy issues relating to virtual assistants.

## Opportunity

A multi-pronged approach **attracting** and **retaining Gen Z** customers using a **generative AI** therapist, audio diary, smart calendar, and address privacy concerns of the public.

- Integrate an AI therapist into the Amazon Alexa platform to provide personalized mental health support using natural language processing and machine learning.
- Develop a smart calendar that integrates with the AI therapist and Alexa to help users manage their time and prioritize self-care activities.

## Outcome

Making the Amazon Alexa brand more **attractive to Gen Z** customers resulting in a revenue increase from \$149.2 billion (Q4, 2022) to \$150.3 billion from Gen Z alone.

- 0.63% increase in revenue.
- Develop personal relationships with Gen Z, increasing brand loyalty and customer satisfaction.





# An overview of Amazon Alexa's current state

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## Skills and User Base

The fact that **79% of digital buyers** from the UK had an Amazon Echo in 2019 highlights the **popularity** of Amazon's smart speakers and suggests that they have a strong user base in the region.

The availability of a high number of skills on Amazon's Alexa in both the US and UK is a reflection of the company's commitment to providing a **personalized and versatile user experience**. This vast selection of skills allows consumers to **tailor their smart speaker experience** to their specific needs and preferences, creating a more engaging and interactive experience.

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## Market Share

With Amazon holding **21.7% of global smart speaker purchases**, Amazon is well-positioned to shape the future of the industry through the innovative integration of generative AI. Additionally, Google Home's **25% market share** puts pressure on Amazon to continue to innovate and develop new features for their smart speakers.





Understanding the Customer

# Meet Andrew

Andrew had always been an **introverted** teenager, preferring to spend time alone with his thoughts rather than socializing with his peers. He was diagnosed with **anxiety and depression**, conditions that were affecting his emotional well-being, academic performance, and relationships.

Andrew's struggles were not unique, **42% of his peers as Gen Z also had a diagnosed mental health condition**, and that the COVID-19 pandemic had only exacerbated the issue. Nearly **70% of his peers reported negative impacts on their mental health** as a result of the pandemic.

The statistics made Andrew feel less alone in his struggles, but it also **highlighted the need for more awareness and investment in mental health resources** and support systems for his generation. He learned that his generation reported the **highest levels of stress and depression** compared to other generations. This was the same case for adults with a past-year major depressive episode, in which the percentage was higher than any other age group.



**Andrew is a Gen Z  
High School Student**

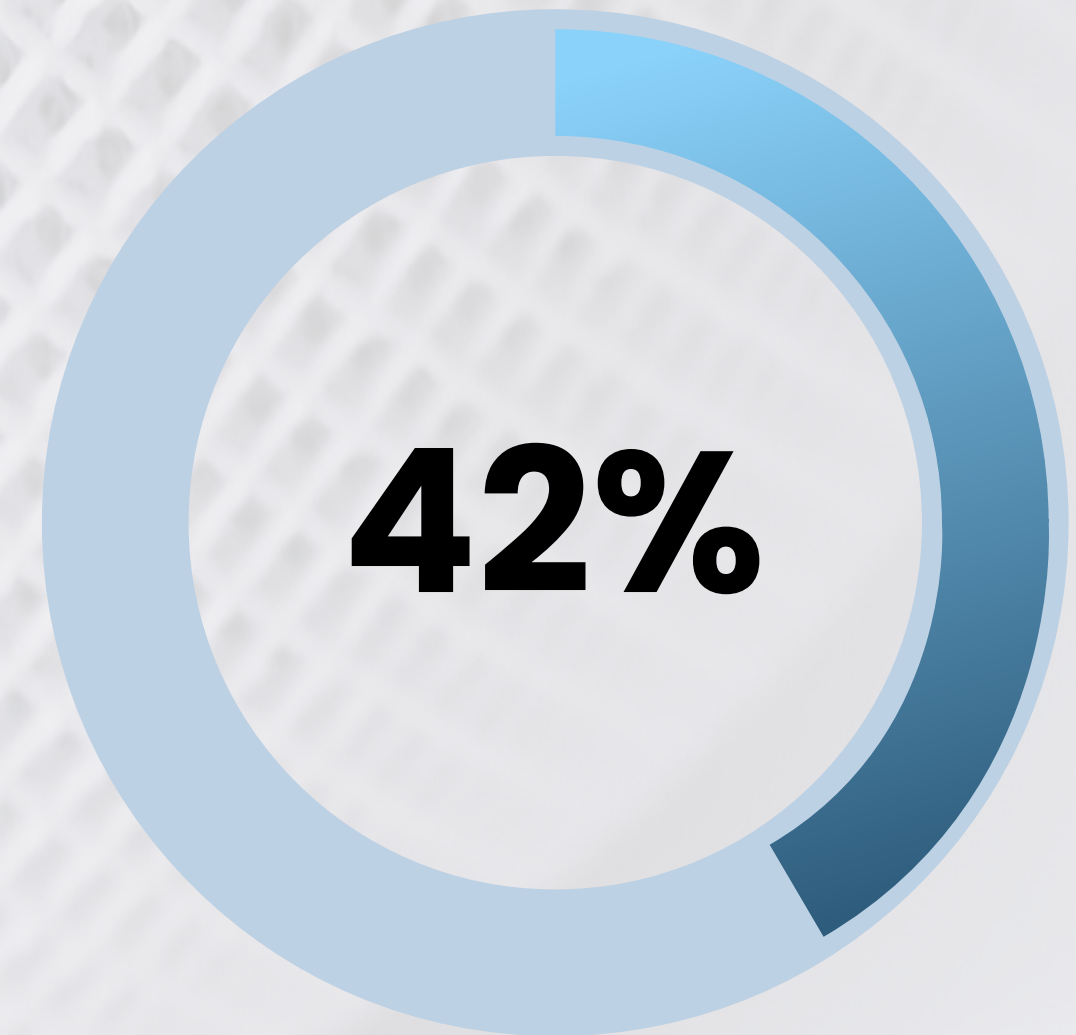




# The lack of investment in mental health resources and support systems for Gen Z underlines the main issue.

The idea of integrating generative AI into smart speakers is often neglected by Amazon Alexa's competitors due to the confusion about integrating this technology efficiently. Amazon Alexa has an opportunity to solve the issues of mental health among Gen Z by providing a generative AI therapist that can offer mental health resources and support systems. **With 42% of Gen Z individuals having a diagnosed mental health condition, there is a clear need for greater awareness and investment in mental health resources.** And the future is through smart speakers.

Amazon Alexa also has an opportunity to address the challenges faced by Gen Zs by managing their work-life balance by introducing a generative AI smart calendar. By utilizing machine learning algorithms, Alexa can help individuals prioritize their tasks and schedule their day effectively, taking into account their work commitments, personal responsibilities, and other activities.







# Solving Gen Zs Overwhelming Concern with Time Management by Using AI Scheduling

Building an AI calendar for Amazon Alexa would add a powerful scheduling and productivity tool to the Alexa ecosystem. And would be a helpful tool for Gen Z to manage their time more efficiently. This new calendar would be beneficial to Amazon and attract Gen Z through:

- 1. Improved Scheduling:** The AI calendar would allow users to **easily schedule** appointments and events, set reminders and alerts, and block off time for tasks and projects **through voice commands**, without having to manually input the information into their calendar. This would improve the user experience and increase the utility of Alexa. This can help ensure they don't overbook themselves, forget important deadlines, and prioritize their mental and physical wellness.
- 2. Personalization:** The AI calendar learns the **individual habits and preferences** of each user, such as preferred times of day for studying or working out. It could also integrate with other apps and devices that Gen Z uses, such as social media and fitness trackers, to provide a more complete view of their daily routine.
- 3. Integration with other Alexa features:** The AI calendar can be integrated with other Alexa features, such as reminders, timers, and alarms. This would create a more **seamless user experience** and increase the usefulness of Alexa as a personal assistant.
- 4. E-commerce opportunities:** The AI calendar can be integrated with Amazon Personalize and be used to **suggest relevant products and services** based on a user's schedule, such as suggesting meal delivery services on busy nights or recommending gifts for upcoming birthdays.







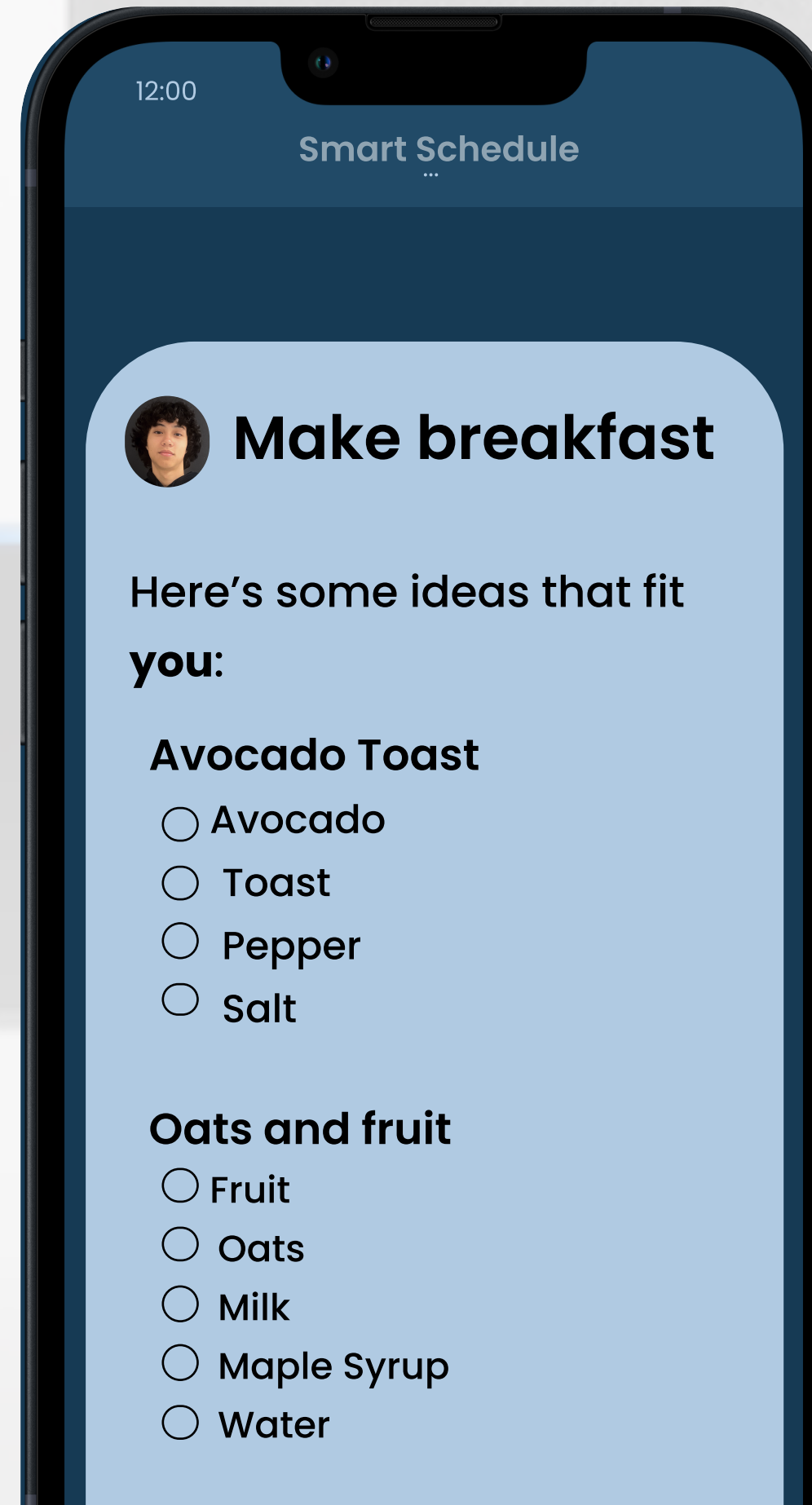
## Amazon AI Calendar Integration with Amazon's Suite of Products

### 1 Integration with Alexa-enabled devices:

- Users could schedule appointments or events using voice commands, such as "Alexa, schedule a meeting for 2pm on Friday."
- Users could ask Alexa for their schedule for the day, week, or month, and receive a verbal summary of their events.

### 2 Integration with the Alexa app:

- Users could manage their calendar from the Alexa app on their mobile device, including scheduling events, viewing their schedule, and setting reminders.
- Users could receive push notifications for upcoming events, and have the option to snooze or dismiss the notification.



### 3 Integration with Amazon Web Services:

- Users could access their calendar information securely from any Alexa-enabled device or mobile device, as the data would be stored in the cloud.
- The calendar could be synced across multiple devices and platforms, ensuring that users have access to their information at all times.

### 4 Integration with other Amazon products:

- Users could access their calendar information through other Amazon products, such as the Amazon Fire TV or Fire Tablet, by using voice commands or the Alexa app.
- Users could use the Alexa device to add items to their shopping list or to-do list based on events in their calendar (e.g., "Alexa, add 'buy flowers' to my to-do list for John's birthday party on Saturday").
- The AI could be combined with Amazon Personalize and use data from other Amazon products, such as Amazon Prime, to provide personalized recommendations for events or activities to add to the user's calendar.

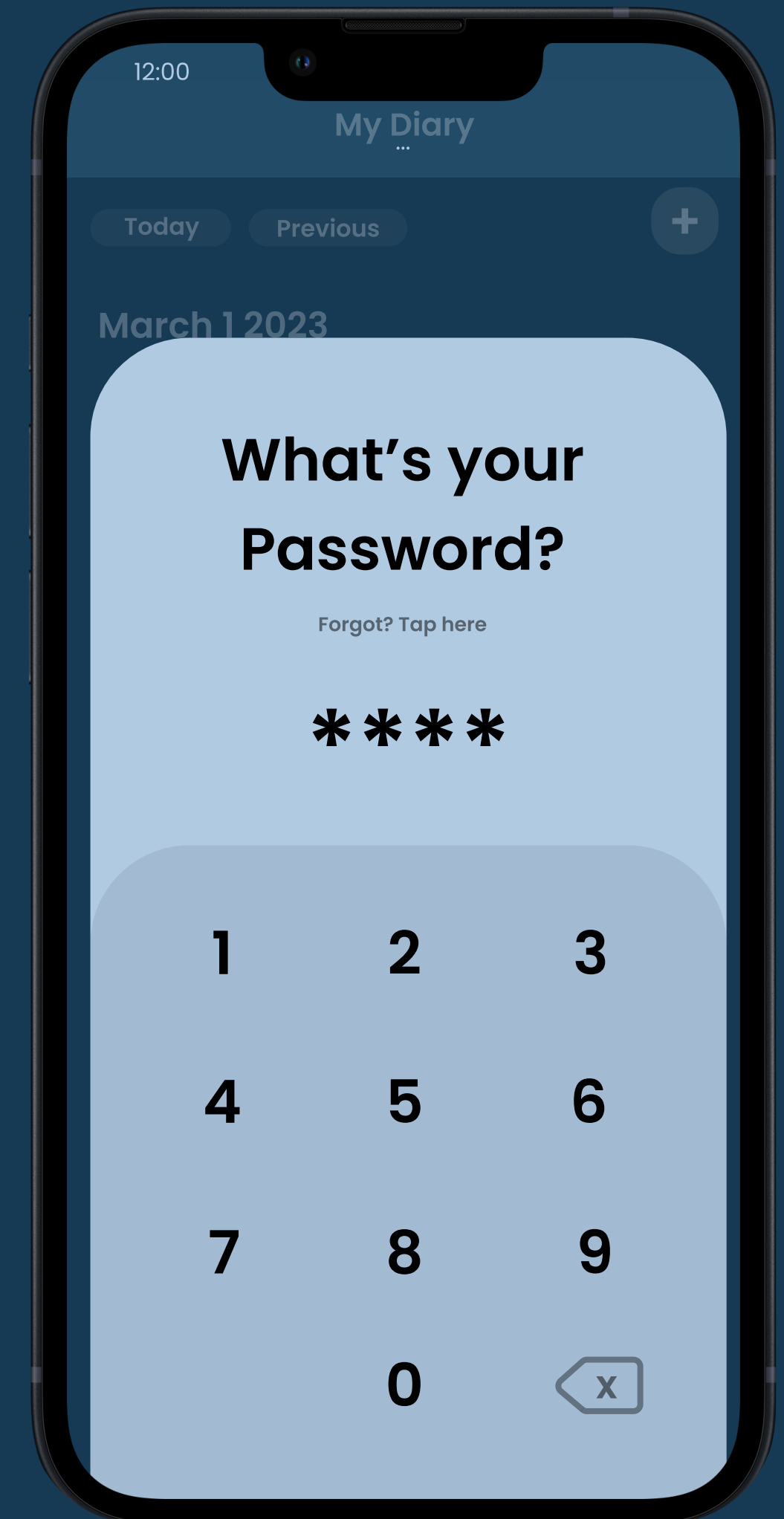




### Record Thoughts with Amazon's Audio Diary

The Amazon audio diary is a voice-activated tool that allows users to record their thoughts, feelings, and experiences that can be accessed through Alexa. Here are some possible features of the Amazon audio diary:

1. **Voice Commands:** Users can activate the diary using voice commands, such as "Alexa, start my diary," or "Alexa, record my thoughts."
2. **Customizable Prompts:** The diary offers customizable prompts to help users get started, such as "How was your day?" or "What's on your mind?"
3. **Timestamps:** The diary automatically adds timestamps to each entry, allowing users to easily track their thoughts and experiences over time.
4. **Mood Tracking:** The diary includes a feature to track the user's wellbeing, such as asking "How are you feeling today?" or allowing the user to select from a list of emotions.
5. **Audio Playback:** Users listen to their previous entries by asking Alexa to play back a specific date or by scrolling through previous entries using the Alexa app.
6. **Integration:** The diary can be integrated with other Alexa features, such as the AI Smart Calendar to reminders or notifications, to help users stay organized and on track.
7. **Multi-User Support:** The diary supports multiple users, allowing families or roommates to share a device and each have their own separate diary.
8. **Encryption:** To ensure the user's privacy and security, the diary could use encryption to protect the user's data.







# Meet Jessica

Jessica had always been a high-achieving student, excelling in all of her classes and participating in extracurricular activities. However, as she entered her senior year of high school, the pressure began to take a toll on her mental health. She found herself feeling stressed all the time, struggling to balance her coursework, college applications, and part-time job.

She was not alone in her struggles, as she soon discovered that 91% of Gen Zs reported feeling stressed, and managing work-life balance was a significant challenge for her generation. Despite this, she was determined to make the most of her final year of high school and secure a bright future for herself.

She was also displeased to hear that 59% of Gen Zs reported an improvement in their well-being in 2022, and she hoped that this trend would increase with the current amount of Gen Zs suffering from mental health issues.

Jessica also learned that 78% of Gen Zs viewed their well-being at work as equally important as their salary. This shift in attitude towards work-life balance concerned Jessica as she is concerned about the support and resources available to her.







# Decreasing Gen Z's problems through AI, while increasing Alexa usage

Amazon has already launched a mental health feature called "Wellness Tips" on Alexa, which provides users with tips and advice on managing stress, anxiety, and other mental health issues. However, this feature does not provide personalized therapy or counseling, and is not intended to replace professional therapy or medical advice.

## AI Therapist will draw new users for:

1. **Accessibility:** The Amazon AI Therapist would be easily accessible to anyone with an Alexa-enabled device, allowing people to receive therapy from the comfort of their own homes. This could be particularly helpful for those who may not have access to traditional therapy due to geographic, financial, or other barriers.
2. **Convenience:** With an AI therapist on Alexa, users could schedule therapy sessions and receive support at any time of day, without having to worry about scheduling conflicts or commuting to appointments. This could be particularly helpful for busy individuals who struggle to make time for therapy.
3. **Anonymity:** For some people, the idea of speaking to a human therapist may be intimidating or uncomfortable. An AI therapist on Alexa could offer a more anonymous and less intimidating experience, allowing people to speak more freely about their thoughts and feelings.
4. **Customization:** The Amazon Alexa Therapist could be programmed to adapt to the specific needs and preferences of each user, providing personalized support and guidance. This could be particularly helpful for people who may feel that traditional therapy approaches do not resonate with them.





# Building the AI Therapist

Amazon has the data to build an AI therapist

Amazon has the NLP models that can be used to build an AI therapist

Amazon has the necessary generative models to build an AI therapist

## 1 Collecting data

To build an AI therapist, a large and diverse dataset of user interactions with the system would be needed. Amazon has collected large amounts of user data that contain value for training. Amazon also has technology to collect biometric data, such as heart rate and breathing rate, through devices like the Amazon Halo. This data could be used to inform the AI therapist's responses and provide more personalized support.

## 2 Building a Speech Emotion Recognition Model

A Speech Emotion Recognition (SER) model would be needed to accurately detect and interpret users' emotional states based on their speech patterns. The transformer model can be an effective choice for building a speech emotion recognition (SER) model. Amazon has developed and released several transformer-based models for natural language processing (NLP) tasks.

- i. BERT and RoBERTa are good choices for tasks that require contextual understanding of natural language
- ii. XLNet and DistilBERT are more efficient and can be used for tasks that require faster training and inference times.

## 3 Building a Generative model

A generative model would be needed to allow the AI therapist to generate responses to user input in a conversational and empathetic manner. Amazon has several generative models that can be used to generate responses in an AI therapist application. In an AI therapist application, a combination of these generative models may be used to generate responses that are both contextually relevant and personalized to the user's needs.

- i. For example, Amazon Personalize could be used to generate user input based recommendations and advice, while Amazon Comprehend could be used to adjust the tone and sentiment of the response.

## 4 Training the data and refining the model

Once the data and models have been collected and built, the system would need to be trained and refined through ongoing testing and user feedback.





# 69% of Respondents are Concerned for Privacy Implications of Virtual Assistants, 41% Stopped Use Completely



The most common concerns that have been collected fall under the following four:

1. **Data collection:** Virtual assistants like Amazon Alexa and Google Assistant are always listening for their wake word. This data is typically stored on servers owned by the tech companies and may be used to improve the accuracy of the assistant's responses. However, users worry about what data is being collected and how it is being used.
2. **Data sharing:** Tech companies may share user data with third-party companies for advertising and marketing purposes, which can be a major privacy concern. Users may not want their personal information or conversations to be shared with other companies without their explicit consent.
3. **Security breaches:** Virtual assistants are connected to the internet, which means they are potentially vulnerable to hacking and other security breaches. If an attacker gains access to a user's virtual assistant, they may be able to access sensitive information, such as financial details or personal conversations.
4. **Surveillance:** Some users may worry that virtual assistants could be used for surveillance by governments or other entities. For example, a virtual assistant could potentially be used to record conversations without a user's knowledge or consent.



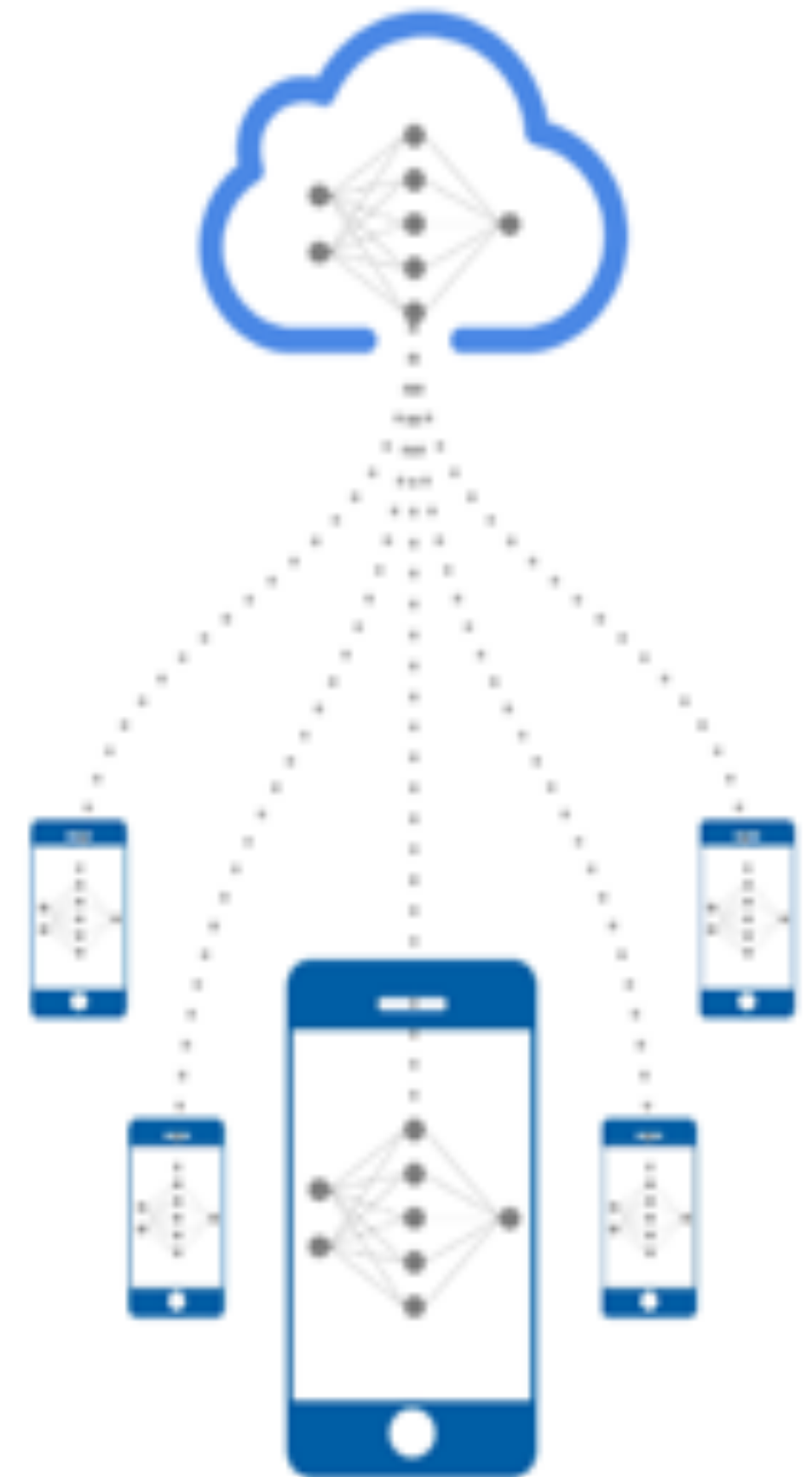


# Using Federated Learning to Combat Privacy Concerns

**Federated learning** is a method of training machine learning models where the **data used to train the model is distributed across multiple devices or locations**, and the model is **trained locally on each device**. Instead of sending the data back to a centralized server for processing, the training is done on the local device, and only the model's weights and biases are sent back to the cloud for aggregation. This allows for **privacy-preserving machine learning**, as the raw data never leaves the device, and the user's data remains under their control.

**Building a federated learning training method will take the following steps:**

- 1 The AI model is first initialized on a centralized server, and the initial weights and biases are sent to the local devices (Alexa) participating in the training.
- 2 The Alexa then train the model on their own data, using the initial weights and biases. The data remains on the Alexa and is not sent back to the server.
- 3 After training is complete, the Alexa sends back the updated weights and biases to the centralized server, which aggregates them with the other participants' updates.
- 4 The updated weights and biases are then used to update the model, which is then sent back to the local devices for another round of training.
- 5 This process continues until the model is sufficiently trained, at which point it can be used for inference on new data.







# Professionals endorse the effectiveness of the innovative solution

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## Arsham Ghahramani

Co Founder and Co CEO of Ribbon



**Arsham Ghahramani** · 6:34 am

High level technical approach is great: a lot of the tech in that space is proven, so it's a case of plugging together large language models, speech to text, and text to speech. Whatever the SOTA is in each of those domains.

[LinkedIn](#)

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## Ali Asaria

Founder of Tulip, and Well.ca



“The ideas sound great! I think if Amazon really implemented these solutions, they would expand their Alexa user base by a lot. If they don't do it, you should honestly do it. Especially because they already have the means and tools necessary to build these solutions, like their BERT models and other NLP models.”

[LinkedIn](#)





# Overview

## AI Therapy

A computer program that uses artificial intelligence to provide mental health counselling to individuals who may not have access to traditional therapy or may be uncomfortable seeking in-person therapy. AI therapists are designed to be conversational and empathetic, using natural language processing technology to understand and respond to the user's input.

## AI Calendar

An AI calendar that involves data collection, cleaning and organization, machine learning models, a user interface, integration with other apps, privacy, and security. The calendar would include functionalities such as scheduling, reminders, recommendations, personalization, integration, natural language processing, location-based features, collaboration, analytics, and privacy and security.

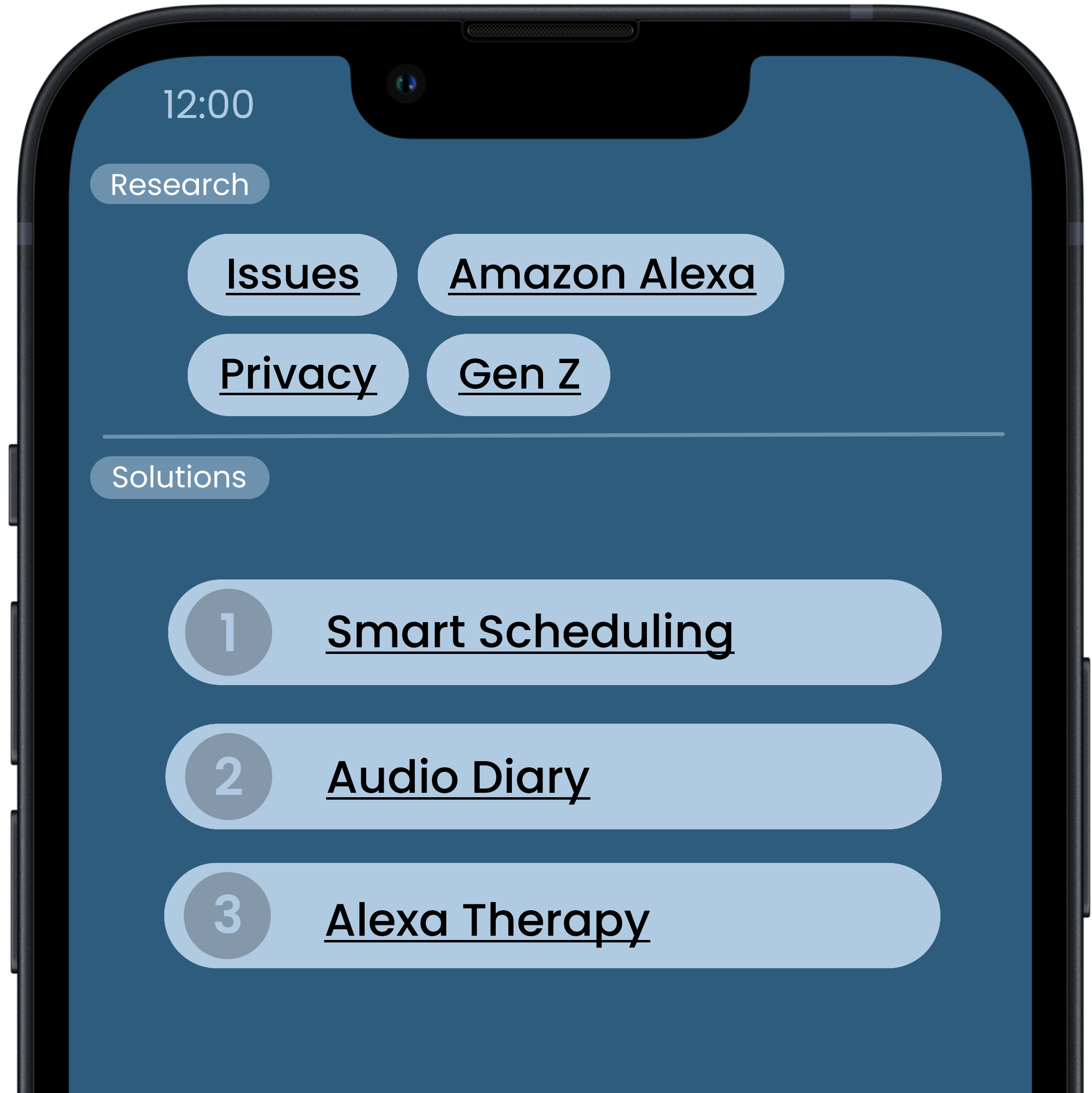
## Audio Diary

An Alexa Audio Diary is a voice-activated tool that enables users to record their thoughts, feelings, and experiences conveniently. With customizable prompts, the diary offers users a starting point for their entries, making it easy to begin recording. The diary features timestamps that enable users to track their thoughts and experiences accurately over time, making it easier to identify patterns and trends.





**“Hey Alexa,  
I have a question”**







Thank You

# Thank You.

Dear Amazon Alexa team,

We would like to express our sincere gratitude for the opportunity to contribute our ideas and recommendations for the future line of products for Alexa. We are thrilled to have had the chance to be a part of such an innovative and exciting project. It has been an honour to work alongside such a talented and passionate team. We hope that our efforts have made a meaningful impact in shaping the future of Alexa and its products. If you have any questions or comments regarding our recommendation, please do not hesitate to contact us via email or LinkedIn.

Once again, thank you for this incredible opportunity. We look forward to seeing the continued success of Alexa and its impact on the world.

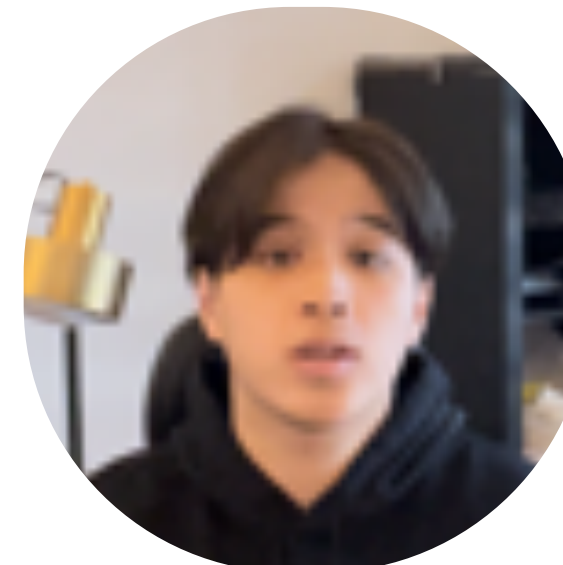
Best regards  
Stella, Karan, Eric



**Stella Cobb**



**Karan Puri**



**Eric Song**

