



Team #99

Zachary Arnold

zacattac@seas.upenn.edu

Matthew Burke

mburke20@seas.upenn.edu

Joseph Koo

joekoo@seas.upenn.edu

Bryan Yao (fall semester)

bryao@seas.upenn.edu

Sebastian Lee

nicklee@seas.upenn.edu

Ryan Hsing-Smith

ryanhs@seas.upenn.edu

Team #99 was mentored by Alyssa Hwang, a Ph.D. student working in Prof. Chris Callison-Burch's lab in the Department of Computer and Information Science.



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Executive Summary

Staying on top of a constant stream of incoming emails is a daily challenge for most professionals.

- The average professional spends around one-third of the workday reading and answering emails and checks their email almost a dozen times an hour.
- Wanting to be viewed as responsive and fearing falling behind on communications, many professionals feel tethered to their devices, continually checking incoming emails.
- Requiring users to sit in front of a monitor or look at their phones to sift through their emails is highly limiting and interferes with workflow, making it difficult to maintain sustained attention.
- Current email systems, such as Gmail, Outlook, and iCloud Mail, typically channel incoming emails into an inbox, with many users receiving hundreds of emails daily.
- Most inboxes typically organize emails by the date and time of arrival, so most users will read or skip emails based on the sender, subject, and assumed content. As a result, users must continually visually scan their incoming emails to check for important communications.



The average professional spends almost 2.5 hours daily on email communications.

Minutes saved by users daily equates to major improvements, but current email systems hinder worker productivity.

- Requires the user to monitor incoming email.
- Pings the user for all emails.
- Visually creates a sense of urgency by keeping counts of unread emails, although not all emails are equally important.
- Causes the user to miss the bigger picture, as all emails are afforded similar “airtime.”
- Leads to information overload, requiring the user to read emails verbatim and in turn.
- Provides a lack of context:
 - e.g., sometimes emails are copied and replied to so many times that the user must sift through the entire email chain before understanding the context
- Offers obscure affordances (i.e., How can you better navigate your email? It’s not obvious!)



Current email systems require the user to spend a significant amount of time monitoring their email visually.



HearSeer is a voice-enabled phone app that frees users from their monitors by allowing them to verbally request and listen to their emails both hands-free and eyes-free. It reduces the amount of time and focus users need to sift through their email inbox, thus improving productivity. The HearSeer app:

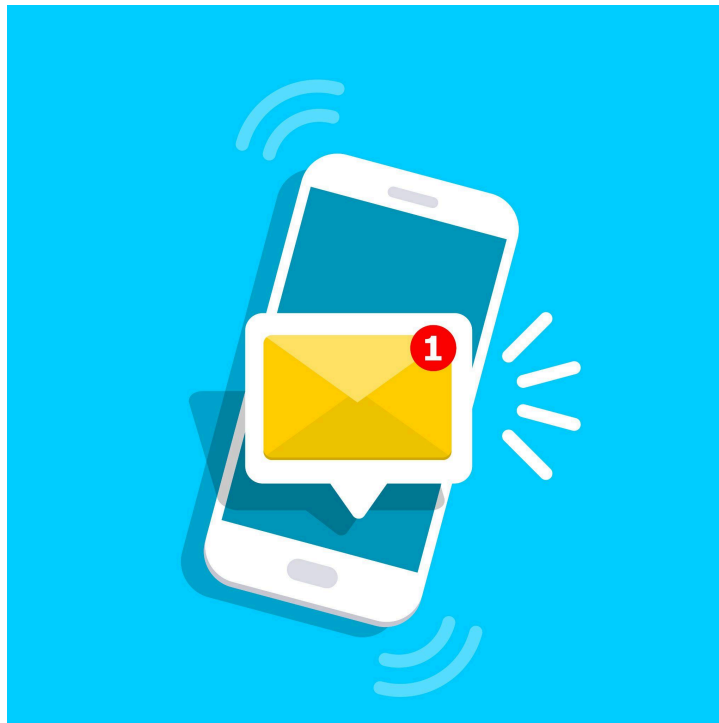
- Allows workers to focus on their work without toggling between screens, thus reducing workflow distraction and increasing productivity.
- Employs natural language processing models informed by artificial intelligence to create succinct summaries of emails that can be easily listened to.
- Uses advanced summarization technology, so users can select the level of detail provided.
- Allows users to filter messages and receive information on important incoming messages using voice commands.
- Can be used in various contexts, such as while on the go, including while walking, driving, and working on other tasks.



HearSeer allows users to interact with their email through a voice assistant, thus improving worker productivity.

By turbocharging voice assistant technology with the latest advances in AI text summarization tools, the HearSeer app makes email smart by:

- Informing users about important incoming messages while providing key background information.
- Empowering users to verbally request a summary or full details on any message.
- Providing appropriate context.
- Being clear about affordances, explicitly letting the user know what the HearSeer app can do to improve their email experience.

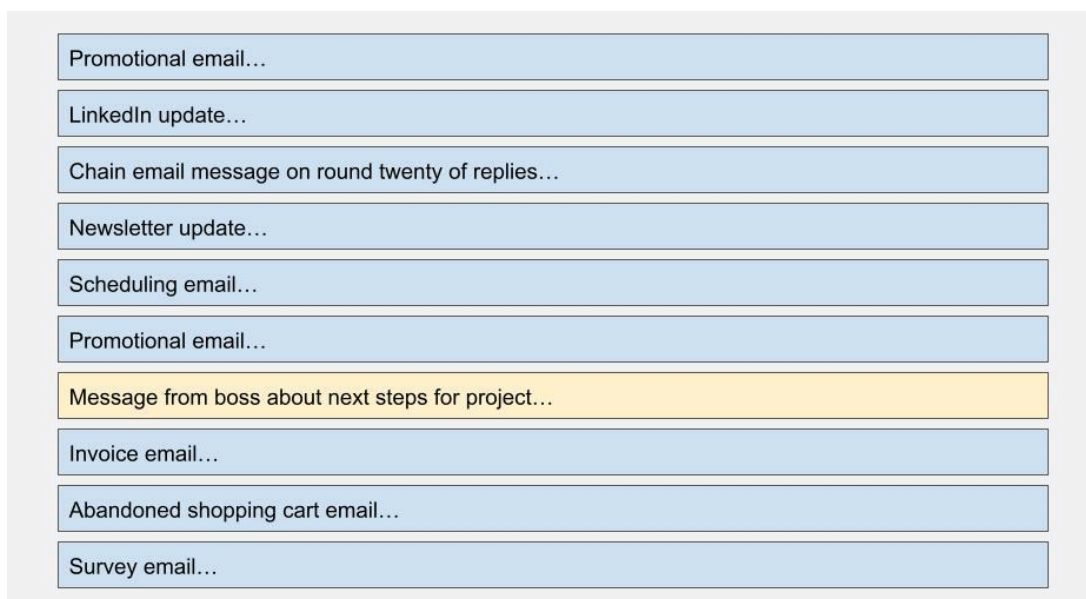


Users can verbally request and listen to additional information about an email without visually toggling between screens, which interrupts workflow.

Need and Value Proposition

Workers struggle to keep current with emails and are deluged with messages of varying importance, some work-related and others not.

- As users toggle between their work and email screens to stay on top of important messages or miss responding in a timely manner, it disrupts workflow, reducing productivity and adding to anxiety levels.
- This distraction results in lost productivity, which impacts corporate profitability.
- Additionally, looking at incoming emails on a monitor also limits workers' ability to check emails on the go, such as while driving or performing other tasks.
 - Many workers spend a significant amount of time driving to and from work, and being able to receive key updates on incoming messages would be helpful.
- Dozens of different types of emails end up jumbled in a person's inbox, with the average worker receiving 200 emails daily.
- Visually, finding key emails is like looking for a needle in a haystack:



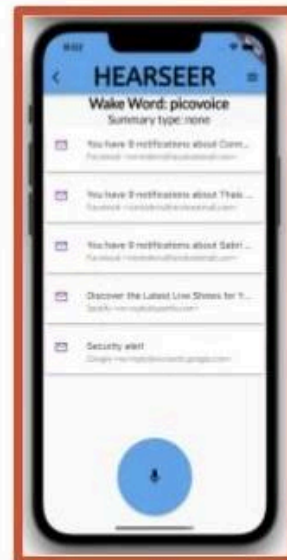
All emails visually compete for the user's attention.

Email communication is inefficient - HearSeer seeks to change that.

- HearSeer is your AI-powered ally in the battle against inbox chaos.
- With supernatural insight and lightning-fast processing, it deftly sifts through the relentless barrage of incoming communications, sorting, prioritizing, and summarizing it all for you, allowing you to respond more effectively.
- Say goodbye to wading through endless emails. With HearSeer, you can read, listen, and respond to your emails more quickly and effortlessly than ever before.
- It's like having your own personal superhero for the digital age, here to rescue you from information overload and help you reclaim your precious time.

As an email productivity app, HearSeer has a voice assistant and can:

- **Poll for new emails while app is open.**
- **Give a general update message at startup.**
- **Provide various levels of summarization as chosen by users.**
- **Query inbox for email by sender.**
- **Set custom alias for senders.**

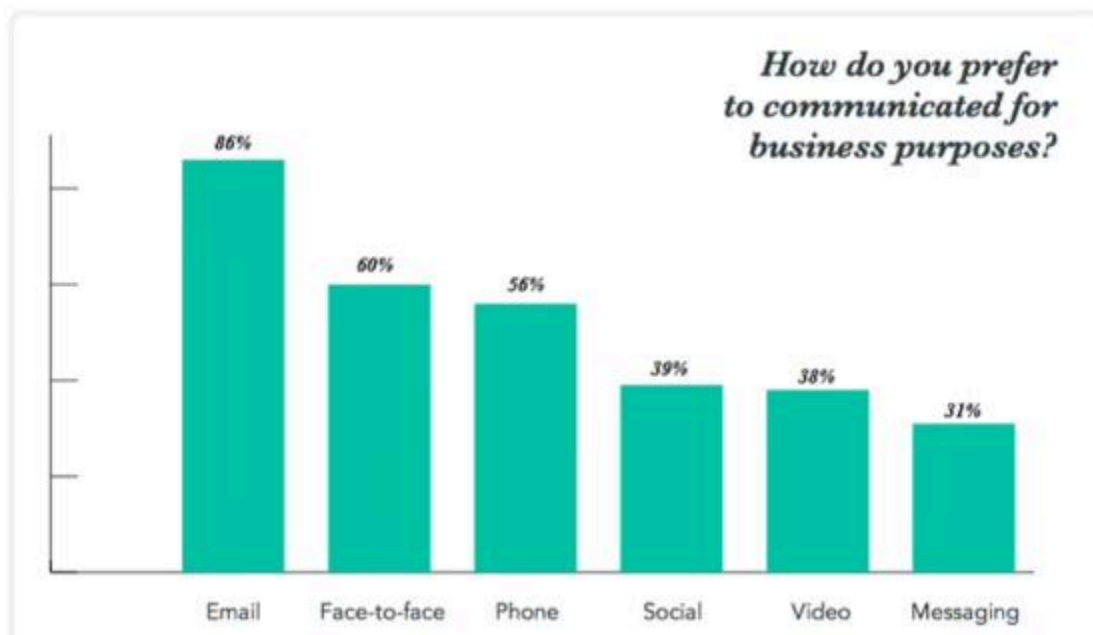


HearSeer's voice assistant makes it easier to cut through incoming messages.

Customer Segment

Companies and professionals are a logical customer segment. According to [Forbes](#), the average professional spends around one-third of their workday reading and answering emails.

- In fact, on average, 86% of professionals name email as their preferred means of business communication.
- Office workers receive at least 200 messages and send around 40 emails daily.
- Assuming a company size of 1000 people working 250 days yearly, this translates into 50 million messages received and 10 million sent yearly.
- A small improvement in email efficiency, even in terms of minutes or hours per day, can result in enormous corporate-wide financial savings.



Email is the communication tool of choice for businesses and our targeted customer segment.

Market Research

Market research demonstrates the need for better email systems.

Specifically, [Harvard Business Review](#) states that the five most common ways time is wasted when it comes to email:

- **Over-checking** email wastes 21 minutes per day. On average, professionals check their email 15 times daily or every 37 minutes.
- **Full inboxes** waste 27 minutes per day. On average, professionals have more than 200 emails in their inboxes and receive 120 new ones each day but respond to only 25%.
- **Archiving emails** into many folders wastes 11 minutes per day.
- **Reading and processing irrelevant emails** costs us 8 minutes per day.
- **Using folders to organize and find emails** wastes 14 minutes per day.

By allowing users to interact with their email through a voice assistant and providing auditory alerts of important incoming emails, HearSeer allows users to check email less frequently and more quickly, reducing time wasted on over-checking and full inboxes.



HearSeer also has applications beyond the professional workplace, such as listening to email hands-free and eyes-free while driving or performing other tasks.

Intellectual Property

Our AI-enabled voice technology is context-aware for email.

- We found that there cannot be a one-size-fits-all approach to text summarization.
- Our mentor’s work informed our project, [Rewriting the Script: Adapting Text Instructions for Voice Interaction](#) (Hwang et al. 2023), which provides an overview of the pitfalls of concisely summarizing text context-appropriately, using Alexa cooking assistance as a case study.
 - Intuitively, we understand that summarizing documents, sports games, conversations, news articles, or even giving audio guidance when following a recipe requires a different approach. In other words, AI text summarization is highly context-dependent.
- We explored market applications where text summarization falls short due to context.
- We found that email system summarization tools fail due to contextual challenges.
- We developed a method of summarizing emails to varying lengths so the user can select the level of detail.

PROJECT IN ACTION

Individual Email Summarization Approach

Incoming Email

To: hearseer99@gmail.com
 From: hearseer99@gmail.com
 Date: Sun, 19 Nov 2023
 Subject: Business Analysis Part 2

Dear Professor Vohra, Thanks! We agree that "Rewriting the Script" does a great job of shedding light on the challenges of using voice assistants for complex tasks, and we're glad to have Alyssa's support and years. In the spirit of using voice assistants for complex tasks and looking towards monetizable applications, our team is producing an AI-enabled interactive email management system as a proof-of-concept (perhaps to be used while driving as a voice assistant or perhaps more like Google Home/GUI-based app). A broader but rough vision/pitch is outlined below. Please let us know your thoughts.

Best,
Matt

SUMMARY

CIS 400 would like to formally thank you for your hard work and dedication, the project is what it is today and that led to the positive results.

Email Chain Summarization Approach

Subject: Re: CIS4010 TA Meeting

03 Sriya Reddi: Tue, Feb 13, 9:41 AM (5 days ago) to me, Joseph, Ryan, Sebastian, Zachary

02 On Tue, Feb 13, 2024 at 12:31 PM Matthew Burke <mburke20@seas.upenn.edu> wrote:

01 On Tue, Feb 13, 2024 at 12:21 PM Sriya Reddi <sreddi@seas.upenn.edu> wrote:

IS Matthew
Yes, that works for me.

Thank! I think our team is scheduled to meet with you on Zoom this Friday at 3:30 - pls let us know if that works for you.

Best:
Matt

Please schedule your next meeting with me to take place before Feb 21st. I am available during the following times:

2/14 (Wed) - 4 pm to 8:30 pm
 2/15 (Thurs) - 2 pm to 9 pm
 2/16 (Fri) - 11 am to 4 pm

Best:
Sriya

SUMMARY

Sriya Reddi requested a meeting to take place before February 21st and provided her availability. Matthew Burke confirmed the meeting time of Friday at 3:30 PM over Zoom and Sriya responded that it works for her.

HearSeer currently summarizes incoming messages and was tested on email chains.

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Market Opportunity

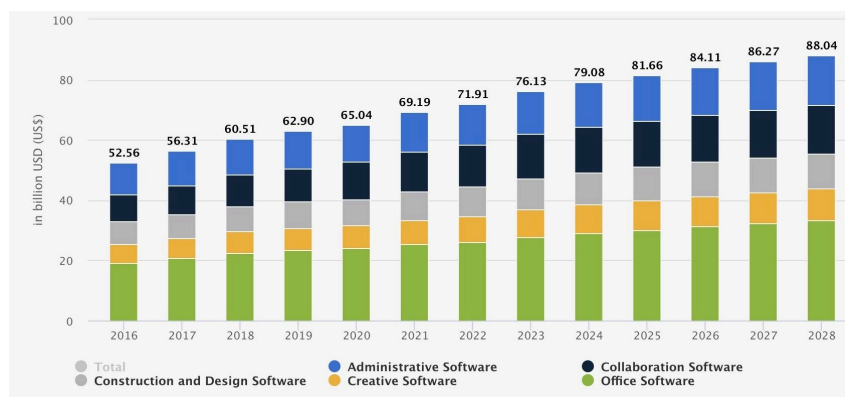
We see a huge opportunity to help improve email workplace productivity.

By turbocharging voice assistant technology with the latest advances in AI text summarization tools and tailoring this solution for email, HearSeer addresses inefficiencies by:

- Reducing email over-checking by alerting users on important incoming messages while providing key background information.
- Allowing users to request that the voice assistant provide a small, medium, or large email summary (or read the message verbatim).
- Providing summarization tools that assist the user with categorizing, organizing, and archiving email messages.

Additionally, according to a [OnePoll](#) survey, workers believe that the emails they send are only fully read and understood by the recipients a third of the time.

- On the flip side, more than half of respondents admitted that if an email is “too long” (i.e., eight or more sentences), they will not read it in its entirety.
- They also will delete emails based solely on the subject line.
- This bolsters support for the need for effective and efficient email summarization tools, as key information is lost when messages remain misunderstood or unread.

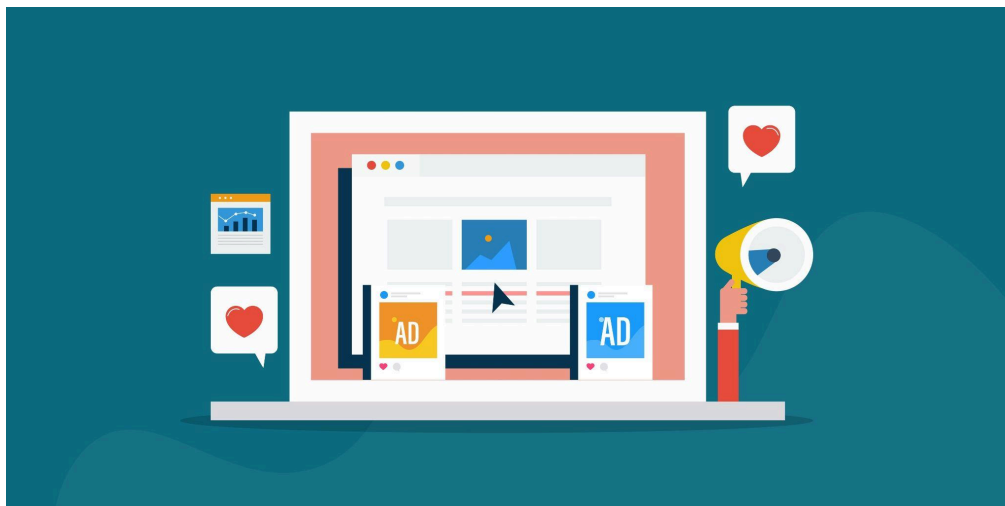


Statista Market Insights predicts strong continuing revenue growth in the office productivity software market space.

Stakeholders

Generating ad revenue is a primary concern to major stakeholders in the email market space.

- Established players in the email market, such as Google and Microsoft, have the capacity to roll out a context-dependent email summarization system.
 - As these players offer free email systems in return for generating ad revenue based on customized content, if users could bypass these advertisements, it could impact their revenue model.
 - Gmail ads are selected and shown based on the user's online activity while signed into Google.
 - Microsoft also generates ad revenue in a similar way.
- However, the threat of entry of these major players doubling down on email productivity tools looms in the enterprise space, yet venture capital firms, such as Kleiner Perkins (e.g., funding Slack) and Andreessen Horowitz's (e.g., backing Superhuman AI, as discussed below), have provided funding for startups in this space.



Free email has a cost in terms of lost productivity as users are distracted by targeted advertisements. HearSeer is a means of bypassing this inbox clutter.



Competitors

Competitors offer summarization tools, which are suboptimal for promoting productivity.

Although there are email systems that can summarize emails, the quality is variable and requires the user to interact with their email visually, resulting in distraction:

- Products such as [Concisely](#), [Microsoft Copilot](#), and [Google Bard](#) offer email summarization tools. These tools require the user to visually sift through emails and request a summary.
 - Concisely offers a one-sentence email summarization tool, which is not very effective, given that emails can vary greatly in length.
 - Microsoft Copilot and Google Bard (now Google Gemini) also offer email summarization tools, but these require the user to request the summary by clicking additional buttons.
- Other companies such as [SaneBox](#), [Mailbutler](#), [Hey Clean Email](#), and [Unroll.me](#) are focused on improving inbox organization.
 - These email productivity tools assist the user by blocking, sorting through, and categorizing emails, but the user still needs to visually check incoming messages.
- [Slack](#) provides an alternative to email.
 - However, Slack is best for active communication on ongoing team projects.
- The main potential competitor is [SuperHuman](#), which promises an enterprise-focused email productivity tool with a ChatGPT-based email summarization tool.
 - ChatGPT powers Superhuman's summarization tool, which is not voice-enabled.



Furthermore, although there have been large advances in text summarization in many domains, these companies' summarization tools have not been specifically trained on and thus tailored for email.

- Concisely, Slack and SuperHuman use ChatGPT, which was developed to summarize web pages and documents. Also, these do not have an effective voice assistant.
- Similarly, Google Bard announced on [10/23/23](#) that it is working on updates to “better understand when you ask for recent emails.”

Additionally, although there are AI-enabled technologies to help the user more easily wade through their inbox, these tools were never designed specifically for email and thus are suboptimal.

- Following the caveats outlined in *Rewriting the Script*, we note that for summarization tools to be effective, they need to be developed context-dependently.
- In other words, using a summarization tool that was not built for email will provide summaries but not in the most effective or efficient manner.
- This is why if you try to ask your voice assistant to help you navigate your email effectively, it completely falters; it was never designed for this purpose.



Conclusion

HearSeer offers an email productivity solution with a summarization tool optimized for email. The voice assistant works effectively as it is overlaid on an email platform. Our proprietary summarization tool and the ability to interact with email hands-free and eyes-free is our key market differentiator and why we are uniquely positioned as a workplace email productivity tool.





Appendix: Cost and Revenue Model

Revenue Model

- As HearSeer enables hands-free and eyes-free email monitoring, the first step in generating revenue would be to benchmark how much time employees can save using the app and how this translates into corporate savings.
 - Companies could be given a trial run with metrics comparing the app's before-and-after impact on productivity in terms of total time spent on email.
- Another potential revenue stream would be to target users who would like to listen to incoming emails and receive alerts, for instance, while driving or walking.
 - This type of application could be offered as an app.
- Additionally, as this technology is nascent, additional beneficial functionality could be developed.
 - For example, the email chain summarization tool was tested but needs further development.
 - This might necessitate exploring potential partnerships with others in and adjacent to this space.

Estimated Expenses

Estimated costs to develop the app over a one-year period:

Personnel Costs

App developer	\$100,000
UX/UI designer	\$ 85,000
<u>Legal</u>	<u>\$ 15,000</u>
	\$200,000

Maintenance:

Server	\$10,000
Backoffice	\$10,000
<u>License/updates</u>	<u>\$ 5,000</u>
	\$50,000

Appendix: Technology High-Level Overview

