MeetMind AI

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1 Introduction

In today's virtual workplace, virtual meetings are an integral part of communication. However, it may be challenging to follow through on discussions, crucial decisions, and tasks delegated. Manual note-taking is time-consuming, and essential details may get misplaced. Users need a solution that can capture and store meeting content in a manner that is efficient, such that they can focus on discussions and not bother with writing down conversations.

This browser extension, MeetMind AI, offers an intelligent method for recording, analysis, and summarizing online meetings. It easily integrates with standard video conferencing in Google Meets. The extension directly records meeting audio, transcribes speech into text, and develops organized notes in terms of AI-based analysis. Users can have a summarized version of the meeting, major points, task assignment, and conversation analysis.

Using LLM model, the application makes sure no important information is left out. Users can always refer to their meeting notes as and when they need to, minimizing the potential for action points missed and communication breakdown. The extension also offers users a clear interface for accessing and managing saved notes, so professionals and teams can easily make use of it.

Deadline: 12 March 2025. Please note that late submissions can affect your score.

2 Proposed Approach

This project involves the development of a web extension that aims to improve the user experience of Google Meet through simultaneous transcription and summary features during meetings. Through its private operation the extension provides efficient functionality with easy usability to maintain all data safely on users' local systems. This system depends on modern browser extensions alongside AI processing to deliver an easy-to-use and secure service that meets needs of users who want automated meeting documentation.

A service worker [1] operates as the extension's core component to enable background processing which maintains normal user browsing experience while the tasks execute smoothly. Virtual connections through content scripts allow Google Meet data access to extract information directly from the platform while keeping it constantly updated. Users access all functions through a popup-based user interface which creates a direct interaction for improved usability. Through Manifest V3 [2] compliance the extension includes Content Security Policy (CSP) protection as well as other security standards which stop unauthorized scripts from running.

The extension achieves enhanced accessibility and supports multiple language transcription through its API connections to Google Meet and Google Language services for real-time speech interpretation. Users have two transcription modes to select either automatic recording that operates without user involvement or manual control to initiate and terminate recordings.

The extension implements CrewAI [3] concept without using the exact framework itself to boost its capability for summarizing and organizing transcripts. CrewAI concept applies dedicated agents to perform transcript chronological ordering (date-based categorization) in addition to its ability to process specific discussion events. The AI-controlled system enables users to find and examine meeting summaries efficiently which enhances operational productivity.

Privacy together with security functions as a key principle throughout the extension's development process. The browser storage of all transcription data and summaries enables users to exercise full control over their personal information compared to the way cloud services operate. Users retain maximum control of their personal data because the extension demands limited permissions essential for its operation.

By the use of up-to-date web extension technologies, artificial intelligence-powered automation, and privacy-centric security controls, this project provides a seamless mode of communication for Google Meet users needing professional and personal communications. Its development method using an analytical approach ensures that the solution is scalable, optimized, and user-centric, making it a useful asset in the digital meeting space.

Deadline: Midterm day.

3 Results

MeetMind AI is created as a web extension to use artificial intelligence for automatically recording, transcribing and summarizing Google Meet sessions. A modern web platform based extension meets all Manifest V3 requirements to deliver secure and efficient service to users.

The technical features integrated within MeetMind AI function to deliver its capabilities. The background Service Worker operates in the background to process data while content scripts embedded in the Google Meet interface obtain real-time meeting data. Through Google Meet's live caption feature the extension operates across different linguistic settings to deliver precise transcription. The Gemini API [4] generates the summary output based on meeting information that grants both brevity and depth.

The extension offers a simple interface through pop-ups to provide users with a smooth experience during navigation processes. Different users have the option to run the extension in either automatic mode or manual control based on their individual working processes. Users have access to a meeting history function that enables requesting meeting summaries from past sessions. All user data remains stored exclusively on their browser since there is no need for third-party storage when privacy is a concern.

During active meeting sessions the extension operates dependably using little system resources according to quantitative metrics. The Gemini API successfully generates summaries that identify essential points and timestamps along with topic sections and action requirements with high accuracy in transcription. Secondary users strongly approve of the product reporting user-friendly operation and the advantages of automated meeting recording as its most beneficial features.

To see how well the extension performs in real situations, we ran some tests of our own. In our trials to test our product, we entered a Google Meet meeting with automatic mode on and tried to talk in a way that we were in an actual meeting and tried to give valid dates and some events attached to these dates. The meeting took like 25 minutes and when we finished the call the transcript was automatically saved into the browser's local storage and we could see the whole transcript in the extension. We can summarize the text and see the important things that are mentioned in the transcript. Gemini is doing a good job of summarizing the whole transcript and extracting the important dates and events. In our second trial, we tried the same thing with manual mode on; however, this time we needed to open the captions part by ourselves so that the transcript extraction could start. The rest of the part is the same as the first trial and the output was still the same. These tests confirmed what

our metrics were showing about the extension's reliability.

The extension showcases important qualitative benefits which enhance user interaction and task completion efficiency. The tool establishes itself rapidly because its setup process requires no complex learning while users easily learn to use it. Users benefit from this system because it prevents them from doing manual note-taking thus maintaining their focus during meetings. The privacy-centered features of the design let users maintain sensitive records exclusively on their devices which professionals highly value for their work. The extension provides flexibility because users can adjust its behavior through different operating modes.

The Gemini API along with a tidy user interface and data storage on local systems combined with history summary functions represent the extension's leading attributes. The project presents various shortcomings which need recognition. The application functions only with Google Meet while requiring the system to generate live captions for successful transcription. Some usage constraints exist with the Gemini API because of its usage limits and related expense factors.

In the following part, the extension's images can be seen:

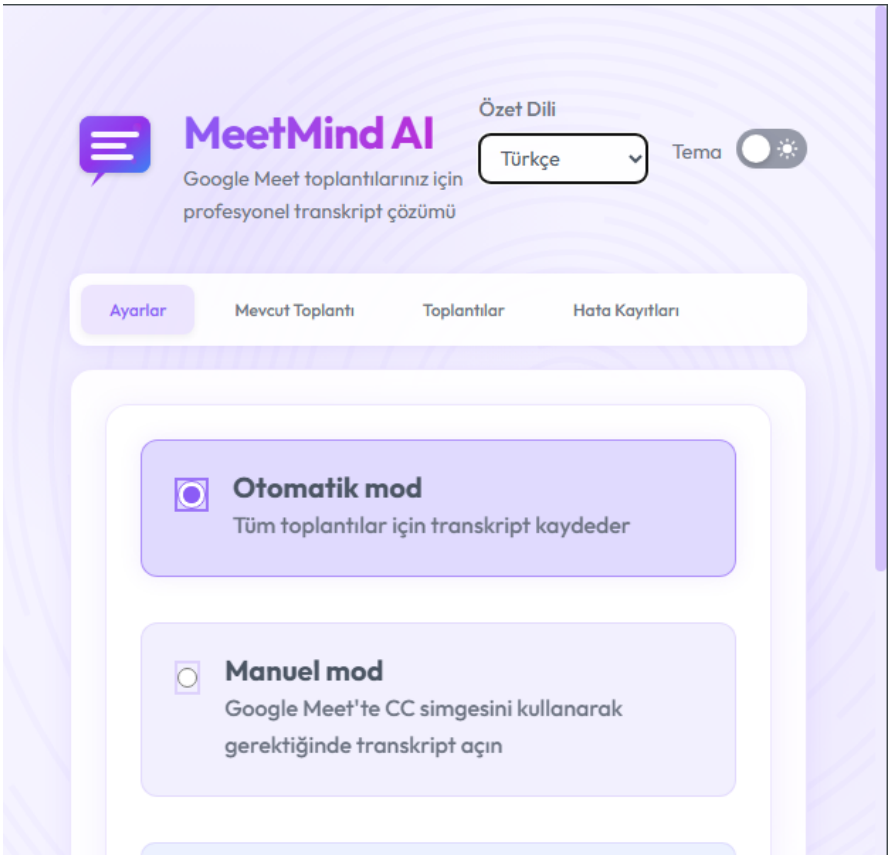

Figure 1: Main Screen of the Extension

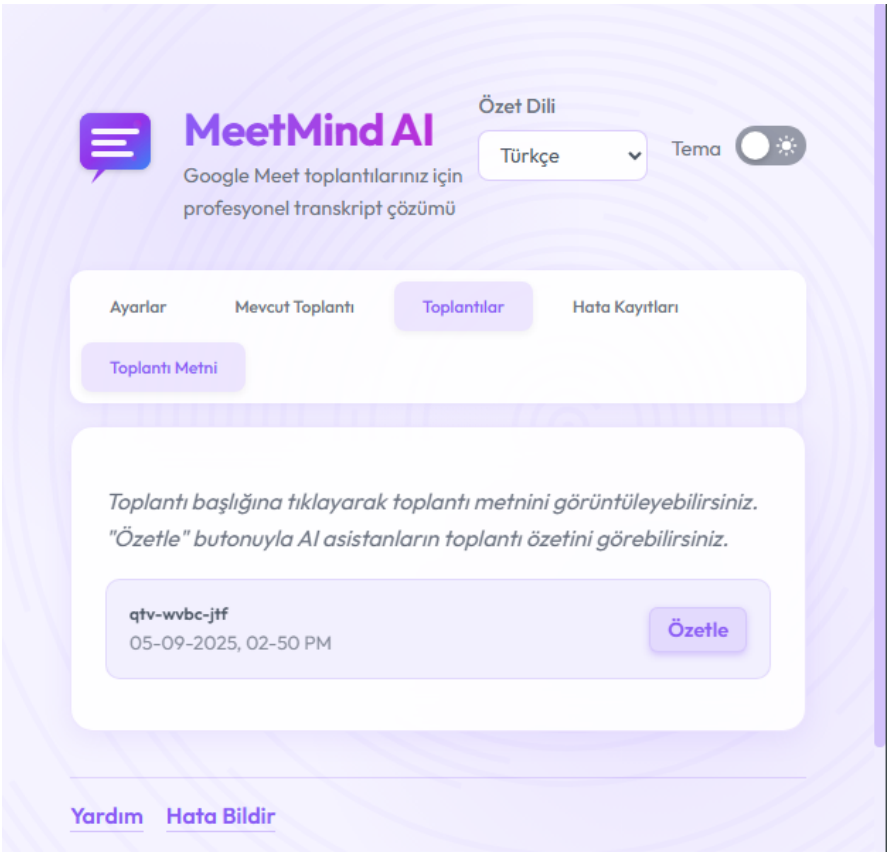

Figure 2: Meeting Transcription History

Figure 3: Meeting Summary Page

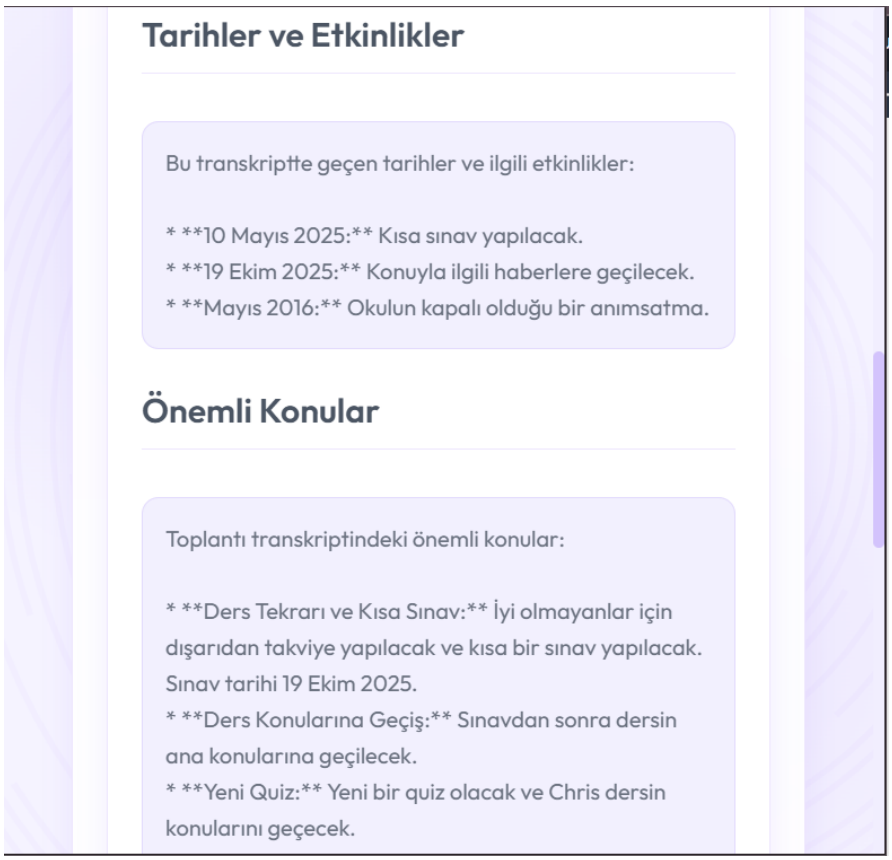

Figure 4: Meeting Summary Page 2

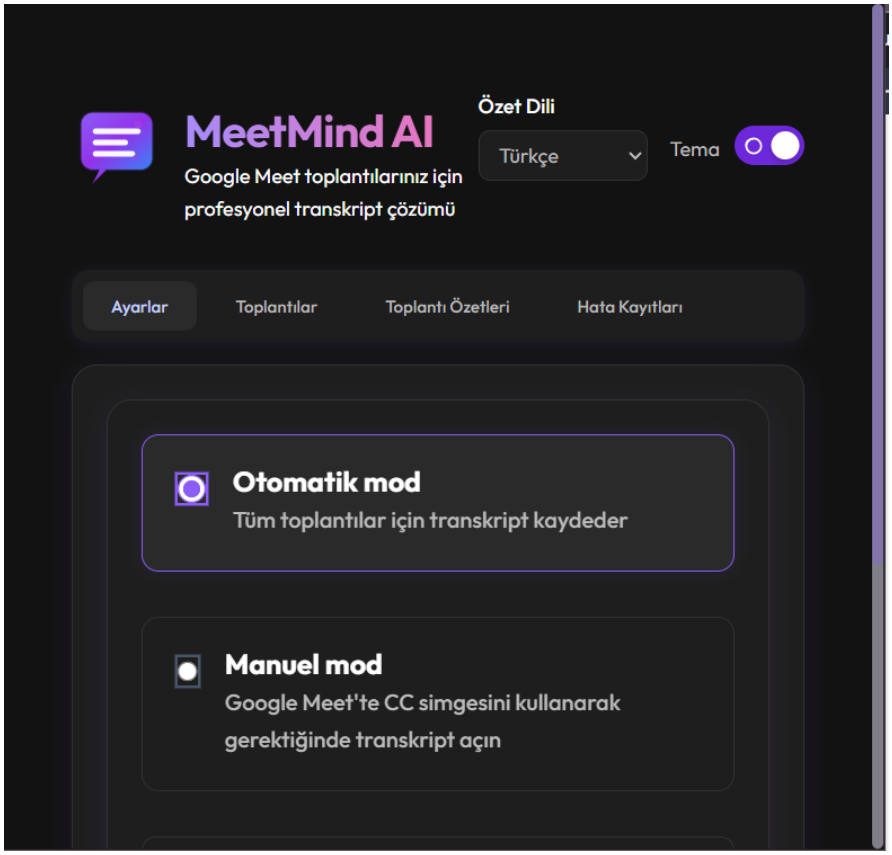

Figure 5: Dark Mode Overview

In conclusion, MeetMind AI delivers a functional system which handles both the automation of online meetings as well as their analysis. AI-driven insights and privacy-first approach improve the quality of virtual meetings in all aspects. The tool requires certain platform dependence at present but upcoming development objectives include strengthening both artificial intelligence summarizing capabilities and user interface convenience.

Deadline: 9 April 2025. Please note that late submissions may impact your score.

4 Discussion and Conclusion

In this section, we provide a conceptual and technical reflection on the MeetMind AI project—an AI-powered browser extension designed for transcribing and summarizing Google Meet meetings. Our aim was to evaluate how closely the final implementation aligns with the original design objectives and to highlight key takeaways from development and testing.

4.1 Architectural Fidelity and Core Functionality

We created MeetMind AI as a Manifest V3 compliant Chrome extension. We were successful in our strategy in using a service worker for background processing, content scripts to retrieve live data from Google Meet, and a popup interface for user interaction and settings. The major features such as recording meeting audio through live captions, speech-to-text, and saving this data were executed efficiently. We introduced automatic and manual transcription modes also, allowing customers to have their choice of defining how transcription would be initiated. These modes were as expected and adhered to original system planning.

4.2 AI-Powered Summarization Concept and Reality

We suggested early on in our report utilization of the Gemini API for meeting summarization and mentioned utilization of a term "CrewAI" for summarization extension and chronological ordering of transcripts. During development, we were able to successfully integrate the Gemini API and employed a multi-prompt technique in extracting different components of meeting summaries including global insights, action items, important topics, and time-sensitive events. In spite of lacking an independent module called "CrewAI" the net effect functions in accordance with its intended purpose—allocating analysis tasks among "expert agents." Rather than CrewAI as an independent AI system, we might have produced similar effects through modular, rule-based interactions with Gemini. Chronological transcript organization, although done, was managed within the popup script, not through an independent AI module.

4.3 Data Privacy and Security

Right from the beginning, user privacy had one of the prime importance. We made sure that we stored all meeting transcripts and summaries locally using "chrome.storage.local" so that users had control over their data and it fit into our privacy-first mindset. One of the key problems that we realized was the hardcoded Gemini API key in the background script. This practice poses a significant security risk, in that it exposes the key to potential abuse and financial responsibility. This weakness contradicts our declared aim of privacy and security, and needs to be addressed forthwith to preserve user trust and allow effective resource utilization.

4.4 User Experience and Feature Set

We made an effort to deliver an easy-to-use and helpful user interface. The popup UI has standout features like mode choosing (working), language selection for summaries, theme switching (light/dark), and going to meeting history. Users have the ability to see full transcripts and can order summaries whenever required, thus enhancing the usefulness of the extension. Following our in-house testing and design objectives, the user interface was easy to use and conforming to our usability requirements.

4.5 Strengths and Weaknesses

The project has some strengths: efficient local storage of data, automated summarization and transcription, and ease of use. These indicate the maturity and practicality of the design. There are some weaknesses intrinsic to it. The extension is tightly bound with Google Meet and depends on its live captioning functionality. Furthermore, the current use of a shared API key creates issues of usage limits, cost management, and security. Without proper API key management, all the consumers are drawing from a shared quota, heightening the threats of abuse.

4.6 Maintainability and Error Handling

To support long-term maintainability, we added error logging and remote status checking functionality. Errors are kept locally, and the content script may send anonymized error reports to a remote endpoint. We also provide a mechanism to read a remote status file, which can be beneficial for notifying users of outages or required updates. These capabilities support ongoing stability and maintainability of the extension.

4.7 Conclusion

With MeetMind AI, we have demonstrated a practical and innovative approach to automating Google Meet transcription and summarization. The extension is successful in delivering much of its conceptual

promise and offers tangible value to users, most notably through its local data handling and summarization customization features.

On that basis, though, the project's biggest flaw continues to be its insecure management of API keys. This significant fault brings into question the project's credibility and usability as much as its tech soundness. To mitigate this, we recommend shifting to a model where individuals supply their own API keys or where requests are proxied via a secure backend proxy (with due note of the privacy concessions involved in the latter solution).

Once this security vulnerability is fixed, MeetMind AI will be a solid and scalable system. Future developments could include the addition of support for additional meeting systems, optimization of multi-agent summarization algorithms, and improvement in the user interface based on continuous feedback. Our existing error reporting and handling mechanisms are a good starting point for continuous development. Although the project is promising and largely working, it cannot be suggested for use by the public until security problems are fixed.

Deadline: Finals day

References

[1] Google Developers. Extension service worker basics. https://developer.chrome.com/docs/extensions/develop/concepts/service-workers/basics, 2023. [Accessed: May 10, 2025].

[2] Google Developers. Overview of manifest v3. https://developer.chrome.com/docs/extensions/mv3/intro/mv3-overview, 2023. [Accessed: May 10, 2025].

[3] InteractiveCalls. Building a collaborative ai workflow: Multi-agent summarization with crewai, crewai-tools, and hugging face transformers. https://interactivecalls.com/2025/03/03/building-a-collaborative-ai-workflow-multi-agent-summarization-with-crewai-crewai-tools-and-huggi 2025.

[4] Gemini Team, Rohan Anil, Sebastian Borgeaud, Jean-Baptiste Alayrac, Jiahui Yu, Radu Soricut, Johan Schalkwyk, Andrew M. Dai, Anja Hauth, Katie Millican, et al. Gemini: A family of highly capable multimodal models. *arXiv preprint arXiv:2312.11805*, 2023.