



LAZY TECH

Meetings evolved

Team Members & Roles



Yagnik Vadher Computer
Engineer (CEO)



Sarthak Sood Electronics
Engineer (CMO)



Rafiul Islam
Systems Engineer
(COO)



Vansh Kochar
Electronics Engineer
(CTO)

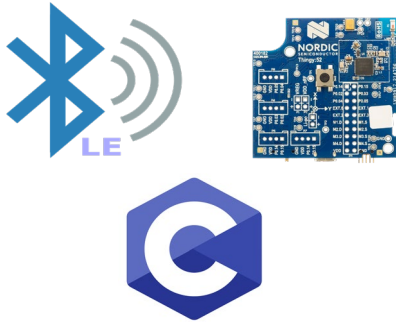


Asal Nassiri
System engineer (CCO)

Team Planning and Task Segregation

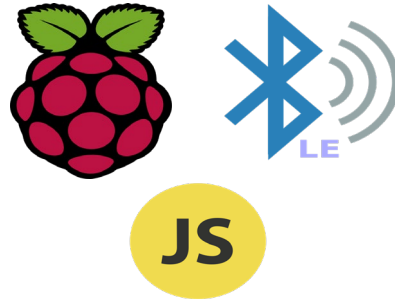
Clip Hardware

- ✓ Vansh Kochar (Lead)
- ✓ Raf (clip design)
- ✓ Sarthak Sood (co-lead)



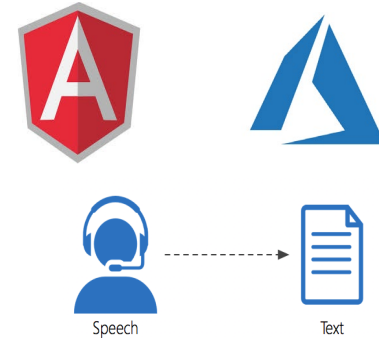
Hub Hardware

- ✓ Yagnik Vadher (Lead)
- ✓ Asal Nasiri(co-lead)



Software

- ✓ Yagnik Vadher (Lead)
- ✓ Asal Nasiri



Purpose

- AI-powered minute taking device to capture meeting minutes during meetings
- Analyze meetings and provide speech to text transcription
- Generate summaries of the meetings
- Smart web application interface that creates a wholesome user experience
- Provide meeting analytics and reports





Background

- Ideas expressed in a meeting needs to be conserved and recorded
- Discussions within meeting are documented referred to as “meeting minutes”
- Meeting minutes serves as a tool to:
 - Summarize important ideas
 - Inform absent members of the discussed action items
 - Review decisions





Motivation

- Least digitized field in personal communication is in-person meetings
- Co-op experience while attending meetings
- No existence of automation for taking meeting minutes
- Unproductive meeting standards in the industry due to poor communication, no follow-ups and unengaged remote participants
- Reduce work effort for the note-taker during meetings





Business Case



Meeting trend of companies

Meetings are meant to be an efficient way to discuss ideas but most of them end up being unproductive due to the following reasons:

- Multitasking
- Checking emails
- Responding to other unrelated work
- Disinterest of remote participants



[4]



Impact of Unproductive Meetings

- Waste of tremendous amount of money
- Waste of individuals and organizations time
- Critically impacts managers and upper management



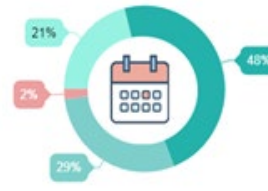
[4]



Meeting Statistics

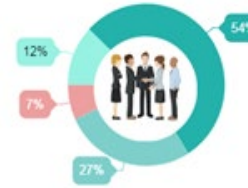
- 50% of the time is being spent on meetings during a week
- 4-6 participants on average attend that meeting
- Meeting spans for about 30 min - 60 min

How often do you have meetings?



■ Every day (21%) ■ Several times a week (48%)
■ Several times a month (29%)
■ Less than once a month (2%)

How many participants attend your meetings?



■ Less than 3 (12%) ■ 4-6 (54%) ■ 7-10 (27%)
■ 11-25 (7%)

What is the average length of your meetings?





■ Less than 30 min (7%) ■ 30 min - 1 hour (49%)
■ 1-2 hours (37%) ■ Over 2 hours (7%)

[5]





Competition

Otter 	Reason 8 
Used to record in-person meetings	Used to record in-person meetings
Needs to be installed on only one device	Users need to install application on their phone
Audio is synced to the transcribed text	Records meeting & provides transcription on its website
Provides audio playback	Uses deep learning model to identify multiple speakers
	Targeted for middle manager



Price

MeetAssist 	Otter 
Hub Hardware: Initial cost of CAD \$105 (estimate)	Premium Subscription: CAD \$8.33/user/month = \$99.9/user/year
Clip Hardware: Initial cost of CAD \$169/clip (estimate)	Ultimate Subscription: CAD \$12.50/user/month = \$150/user/year
Software Subscription: CAD \$240/year (estimate)	
Total Cost(4 users): CAD \$1024/year	Total Cost(4 users):- CAD \$600/year

Funding

Funding is derived from three sources

- Wighton Engineering Development Fund
- IEEE Canadian Foundation
- ESSS Engineering Science Student Endowment Fund





Ideal Customer/Customer Considerations

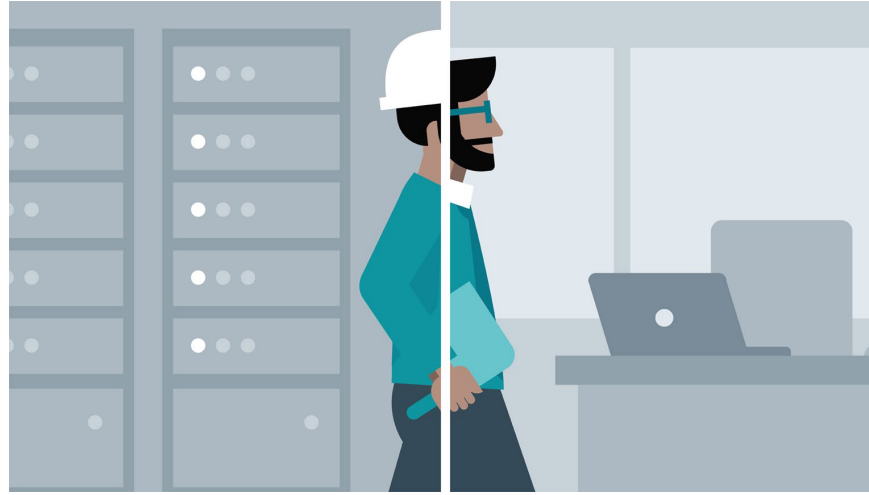
Targeted customers

- Mid to large sized corporations
- Journalists
- Universities/schools

Customer Feedback

- Accuracy of transcription
- Optimal product cost
- Regular firmware updates
- User friendly

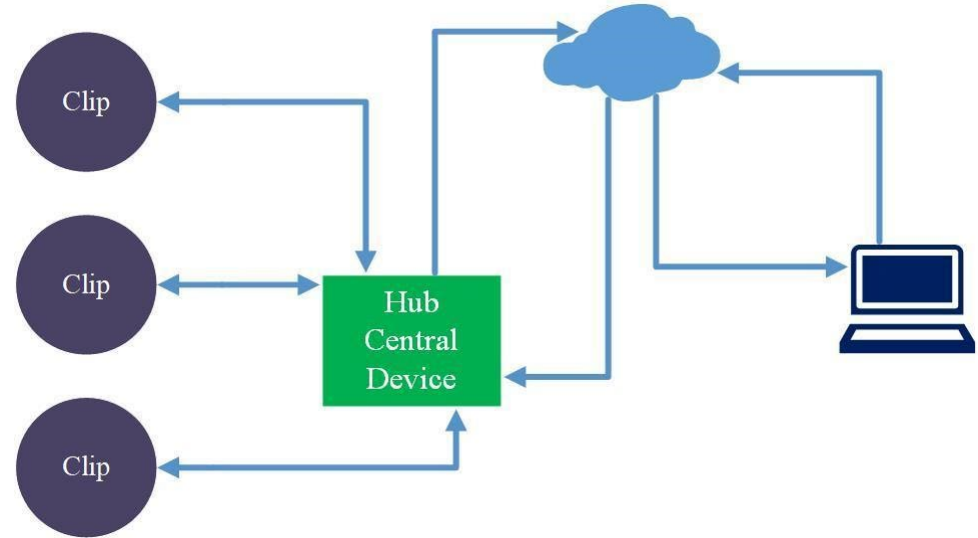




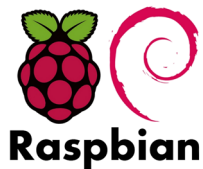
Technical Case

Product Overview

- *MeetAssist* will consist of three primary components: Hub, Clips and web portal (connected via cloud).
- All three components will be connected together and communicate over wireless technology standard such as Bluetooth and Wifi.



Technologies



- Raspberry Pi 3 B+ for Gateway
- Efficient and ease of development with Raspbian Stretch
- Firmware -> Javascript, C/C++



- Azure cloud services
- Azure cognitive service
- Easy integration

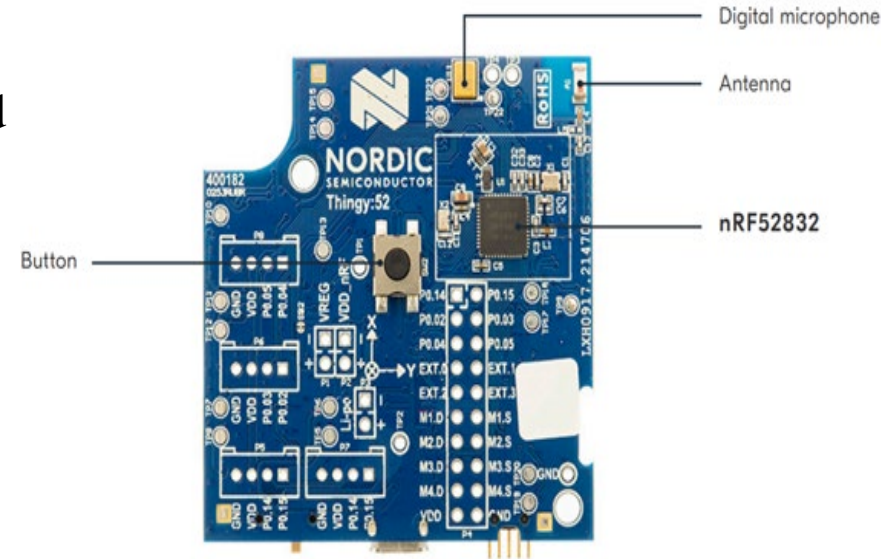


- Simplified MVC pattern
- SPA
- Supported by big firms
- Speed & Performance
- Cross Platform



Clip

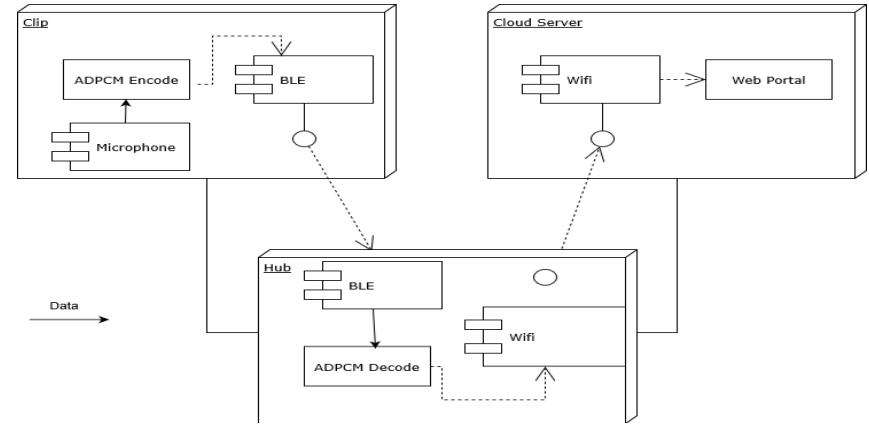
- The Clip is a device that is responsible to record the high-quality audio
- Transmit the recorded data to the Hub.
- In Prototype stage the clip will contain the Nordic Thingy 52
- A prototype board containing the required microprocessor and microphone to capture and transmit voice data to the Hub.
- In the Product stage we will design custom made PCBs with a built in BLE and microphone to communicate with the Hub.





Hub

- The Hub is a platform and device which is responsible to collect all the recordings from multiple clips
- It will send the collected voice data will send it to cloud in real time.
- This will contain a Raspberry Pi 3+ with Broadcom chip BCM2837
- To process the incoming voice data and transmit it to the cloud.



Web Portal

- Client End solution
- User friendly project management like tool
- Communication is done over HTTP
- Intended to make real time transcription.
- Backend does all the computation and transcription



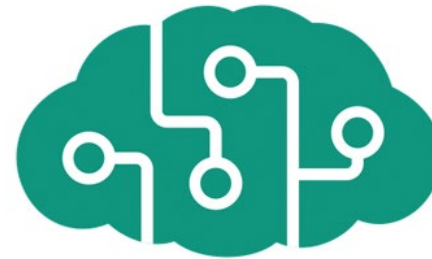
Cloud Service

3 main services:

1. Web server
2. Database
3. Artificial Intelligence model



mongoDB



 Microsoft

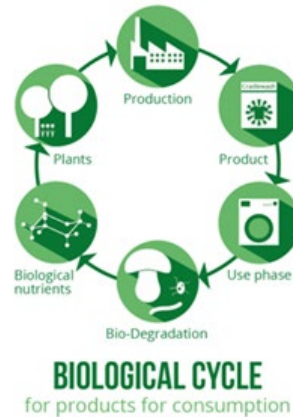
Cognitive Services

Engineering Standards and Design

Cradle-To-Cradle Design

We implement the cradle-to-cradle design to for the proper disposal of the MeetAssist's materials:

- PCB
- PLC
- various metals

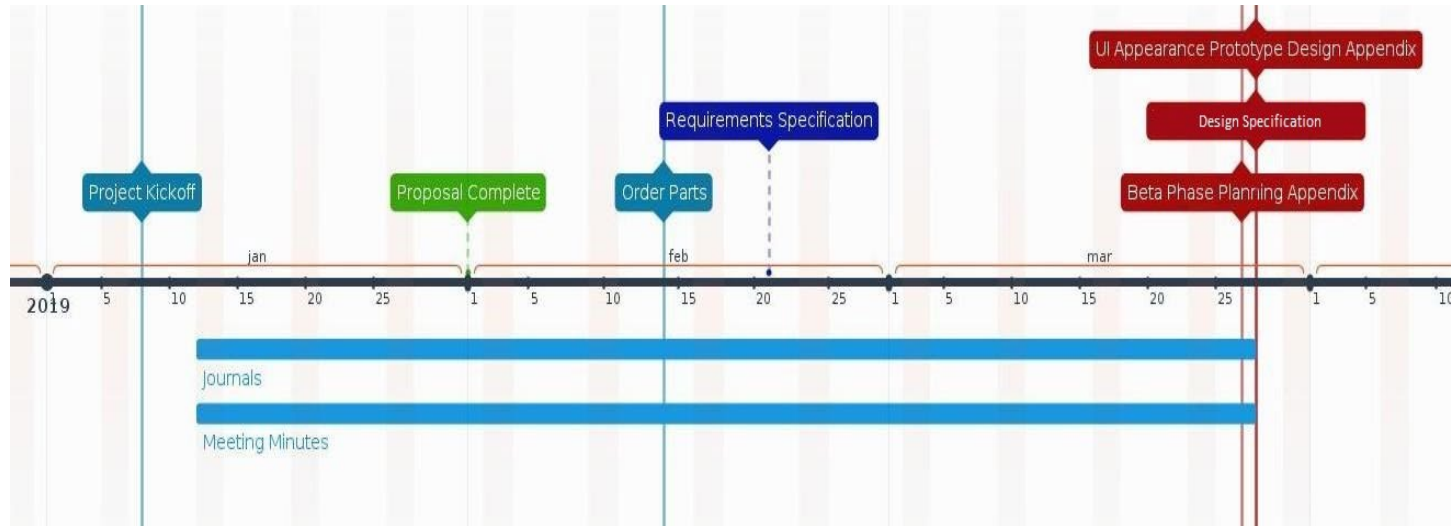




Costs

Component/Service	Price
NRF6936 NORDIC THINGY:52 BLE DEV BOARD	\$60.42
NRF52-DK DEV KIT FOR NRF52 BLE/NFC	\$55.32
Raspberry Pi (Model B+)	\$46.50
Shipping charges	\$12.00
Tax (GST+PST)	\$16.82
Total	\$191.06

Schedule





Risk Analysis

- Data protection in gathering, storing and transferring of data
 - Employee identities
 - Meeting times and locations
 - Audio recordings
 - Transcriptions of audio
 - Meeting analytics data
- Secure hardware casing
 - Tamper-proof hardware
 - Safety standards
 - Child safe





Risk Management

- Software
 - Open Web Application Security Project (OWASP) requirements
 - Secure storage of data by end-to-end encryption and usage of secured cryptographic algorithms
 - 2nd Factor Authentication in later iterations of product
- Hardware
 - Secure OS
 - Tamper-proof casing ensures device cannot be tapped/bugged



Adherence to Standards (a)

CAN/CSA-C22.2 NO.60065:16	Cloud services must translate audio recording to text [7]
CAN/CSA-C22.2 NO.61508-1:17	Audio, video and similar electronic apparatus - Safety requirements (Adopted IEC 60065:2014, eighth edition, 2014-06, with Canadian deviations) [7]
CAN/CSA-ISO 14040-06	Environmental Management - Life Cycle Assessment - Principles and Framework [8]
CSA C22.1-15 PACKAGE – 2015	Canadian electrical code, part I [9]



Adherence to Standards (b)

IEEE 802.15.1	Standards for WPAN/Bluetooth [10]
IEEE 802.6	Standards for information exchange between systems [11]
IEEE 830	IEEE Recommended Practice for Software Requirements Specifications [12]
IEEE 1016	Standard for Software Design Description [13]
IEEE 1074.1	IEEE Guide for Software Development Life Cycle [14]

Self-Reflection

- Better communication
 - More frequent meetings
 - More team building activities
- Better Project Management practices
 - Better scheduling of development tasks and documentation
 - Allocating more time for testing
 - Making time for last minute hiccups
- Process improvements
 - Learning how to better order electronic components online



Brief Plan for ENSC 440

- Design Custom PCB Board over the Break
- Work on Beta Phase Planning Appendix During the Break
- Integrating Multiple Clips to the Hub
- Work on 3D printing the casing for Hub and Clip
- Add discussed components and features to the Front End (Previous Meetings, Analytics, Tutorials)

Conclusion

- MeetAssist provides a medium for storing verbal communication exchanged in a meeting by using speech to text AI in sync with speech differentiating microphone.
- This product provides a method for formatting and analyzing data which could be documented for the purpose of checking the productivity of a meeting.
- Through the use of a microphone component MeetAssist will differentiate between speakers in a meeting which could be vital in segregating meeting objectives once the meeting has been conducted.
- Our web app will offer the customer an elegant means to edit and manage their data.

Questions





Demo



Appearance Modelled

Psychology of Shapes [15]:

- Straight lines provide a sense of reliability
- 90° angles give a sense of security

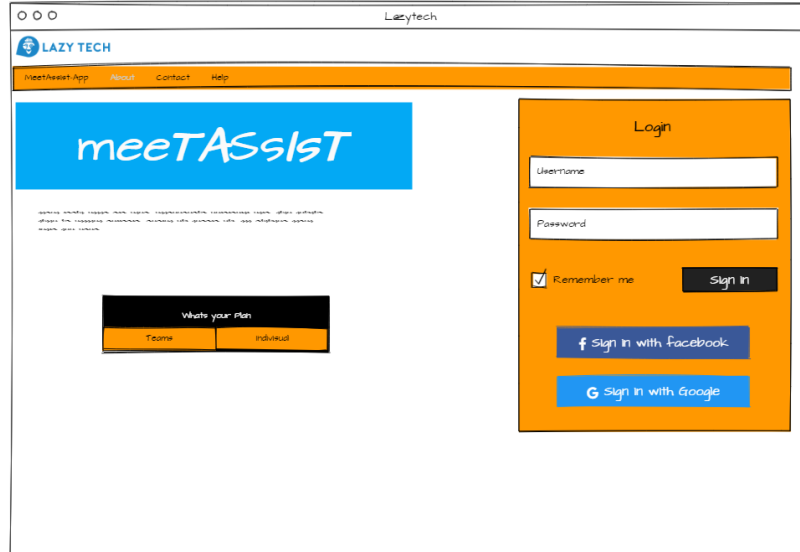
Colour:

- Base: Company cyan blue colour
- Power Button: Red
- Record Button: Black

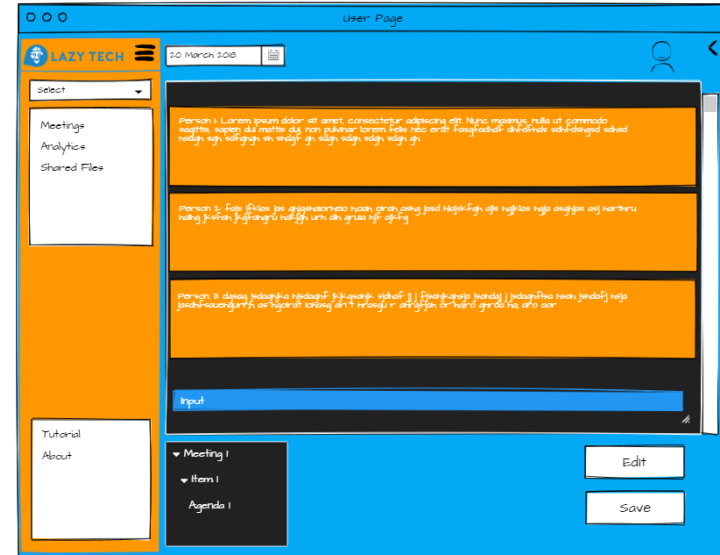


UI Design

The Home Page



The Dashboard





Feedback Considered

- **Microphone Setup** - Ashley's Feedback
 - The linkage between microphone and the user can be indicated through the web application.
- **Multiple speakers scenario** - Dr. Scratchley's Feedback
 - We are to develop a queue where speakers hold their position until it is their turn to speak.
- **Background noise and the accuracy of word detection** - Dr. Scratchley's & Dr. Rawicz's Feedback
 - We are considering a functional design of the microphone clip that can be clipped close to the user's mouth.
 - Use of Microsoft's AI-powered Cognitive Services to do audio-to-text transcription with lower error rate

Questions



References

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