Semester Thesis Project Report

PROJECT TITLE

ISHAN DHWANI - A brief inquiry into the Assamese language

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1 Introduction

A research project under Dr. Priyankoo Sarmah, "A Broad Socio-Linguistic Study of Vowel Variation in Assamese" [4], studied the effects of socio-linguistic factors on vowel pattern variation across different dialects of Assamese spoken in the Brahmaputra valley. Data was collected in a raw format and this inherent information was difficult to comprehend. Unless analysed and processed, raw data in itself can be daunting for the common user. We saw this as an opportunity for a great design.

1.1 Project brief

To redesign a Soundscape interface with the Assamese language as a use-case and create an effective representation of data for the common user.

1.2 Objectives

1. Understand the domain of Soundscapes and linguistic features specific to Assamese across different districts of Assam.
2. Detail interactions and interface design requirements, along with possibilities of visualising information specific to Assamese across different districts of Assam.
3. Create an effective user interface for the common user to make sense of the raw data collected by the research.

Keywords: Interaction design, Sound archive, Soundscape, Data representation.

1.3 Motivation

In our current fast-paced world, everyone wants information at the tip of their hands as fast as possible. A well designed interface which showcases the linguistic features of Assam allows for anyone in the world to quickly and easily interpret and understand it.

With abundance of information comes the ability to play with it. We also wanted to discover what else we can achieve with this data and how people can contribute towards it.

1.4 Organization of the report

The following pages contains the background of the project which explains the relevant history of data representation and soundscapes. This is followed by the domain review, where we analyse existing solutions and designs. We also talk about the journey we took through various iterations and how we reached the final prototype. Going further, we share the details of the concept and the environment it's being developed on. We then go on note the various feedback given throughout the course of the project. Finally, we talk about the limitations of the current concept and what the future holds for this design.

2 Background

Friendly, M. (2001) defines data visualization as "information which has been abstracted in some schematic form, including attributes or variables for the units of information" [1]. In other words, it is a meaningful way of visually communicating quantitative content. Based on its features, data can be represented in a variety of ways, such as a line graph, bar chart, pie chart, scatter plot, or a map.

Data is inherently difficult for the human brain to understand and retain. Miller, G. (1956) states that "most adults can store between 5 and 9 items in their short-term memory" [2]. It is hence difficult for the human brain to understand numbers or items larger than five without drawing any kind of abstraction. Data visualization designers play a vital role in creating these abstractions. By turning complex numbers and other pieces of information into visuals, data becomes easier to follow and use.

The information acquired from the research includes various data such as speech recordings, speakers' level of pride, lexical term variations, age, gender, and educational background. This design proposes to interpret the vast array of information from the paper onto a medium which is recognisable and easily accessible by everyone.

2.1 Soundscapes

Soundscape, a term first coined by the Canadian composer R. Murray Schafer, is defined as a sonic landscape. It is the total acoustic values related to a certain place [5]. We looked at multiple examples of soundscapes such as The Soundsslike Project and Soundscape World to get a sense of how we can build an interface with sounds as an essential feature.

2.2 Soundscapes as Information

Miller, N. (2013) states that soundscapes can be understood only through peoples' perceptions, and using those perceptions we can link soundscape improvement and design [3]. Information can easily be interpreted when we create an abstraction with the sounds from the soundscape. While the user listens to the sounds, he can read and interpret the data served to him via the soundscape interface. This became our goal.

3 Design Process

The process for this project involves the following steps:

1. Domain review,
2. Design analysis,
3. Ideation and conceptualisation,
4. Design prototyping and iterations, and
5. Peer review

4 Domain review and design analysis

The existing designs for such soundscapes were varied. The Soundsslike Project used small dots as identifiers for sounds. On click, it plays the audio along with details about the place. The problems with this design were as follows -

1. The identifiers were too tiny to click.
2. The icons were placed too close together and mis-clicks were common.
3. There were wasted space around the interface which took most of the screen.

Soundscape World had a different approach. It consists of a player with multiple buttons and a lot more control on the audio. These were categorised into the nature of the sound. This design was completely different from Soundsslike and it had the following faults -

1. There were no information regarding the sounds.

2. It doesn't properly guide the user to its functions.

5 Ideation and conceptualisation

Multiple pen sketches and iterations were done throughout the brainstorming period. It was early on established that the interface would encompass a tabbed model for different functions for the page.

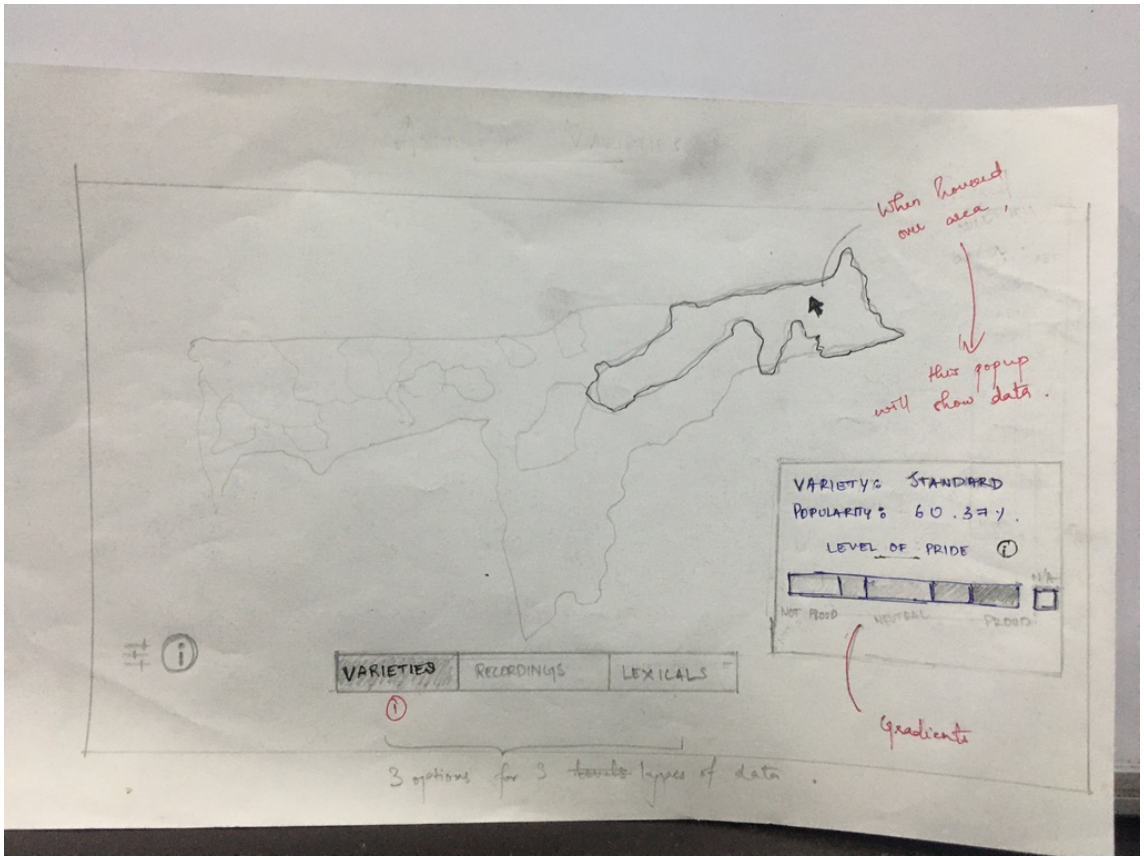

Figure 1: Varieties Screen in early concept

The design followed a map interface which when hovered or clicked showed the data. It was divided into three. The buttons were initially placed in the bottom, but was moved to the top in further iterations for better clarity of design.

The Pop vs. Soda page was used as a reference to make a map which would show details while hovered over (Figure 1). Other iterations included Audio buttons

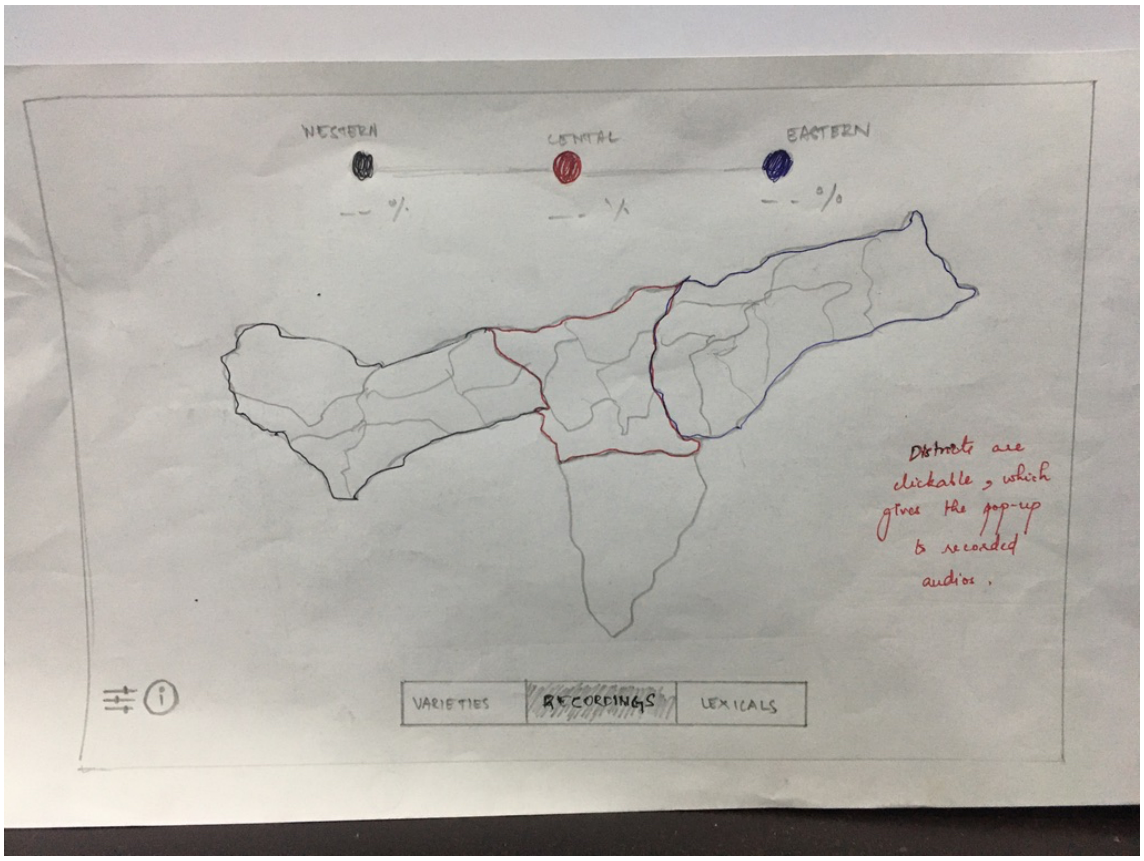

Figure 2: Listen/Recordings Screen in early concept

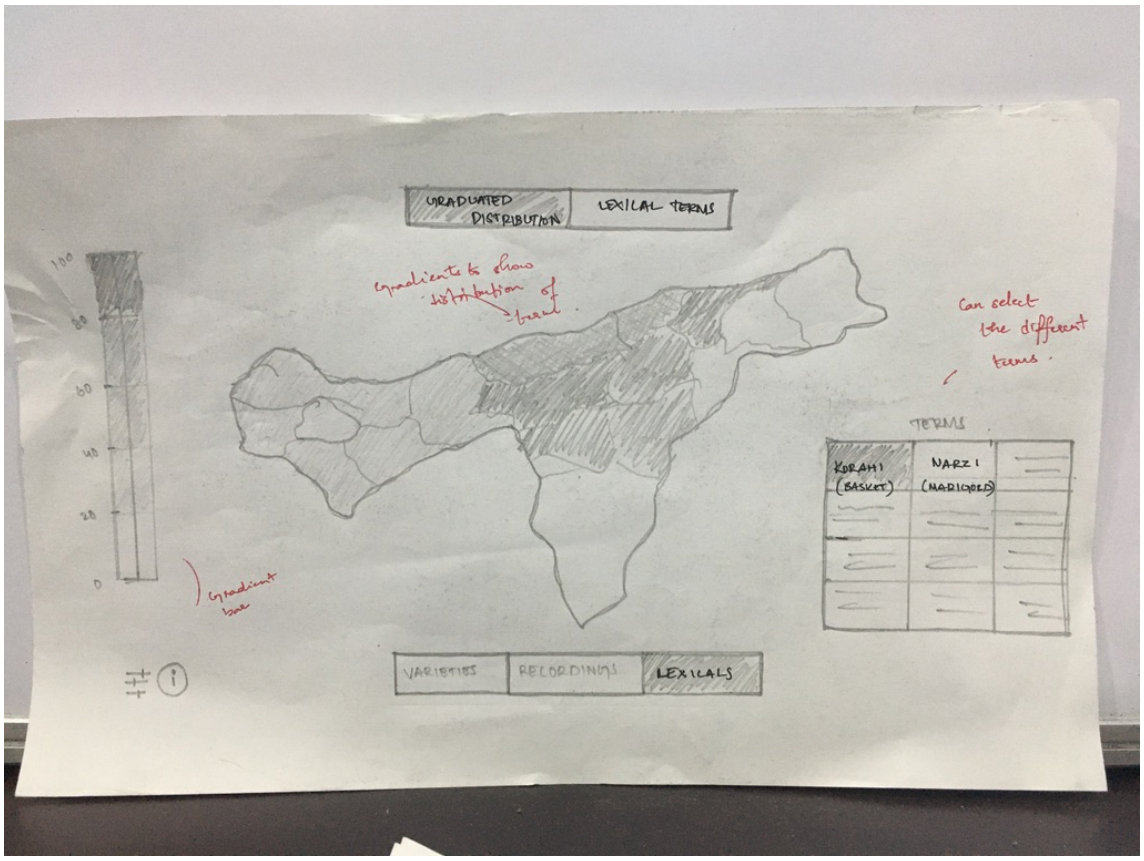

Figure 3: Words/Lexicals Screen in early concept

which would take to the location in the map, but this was not preferred as the visual representation was weak.

6 Design prototyping and iteration

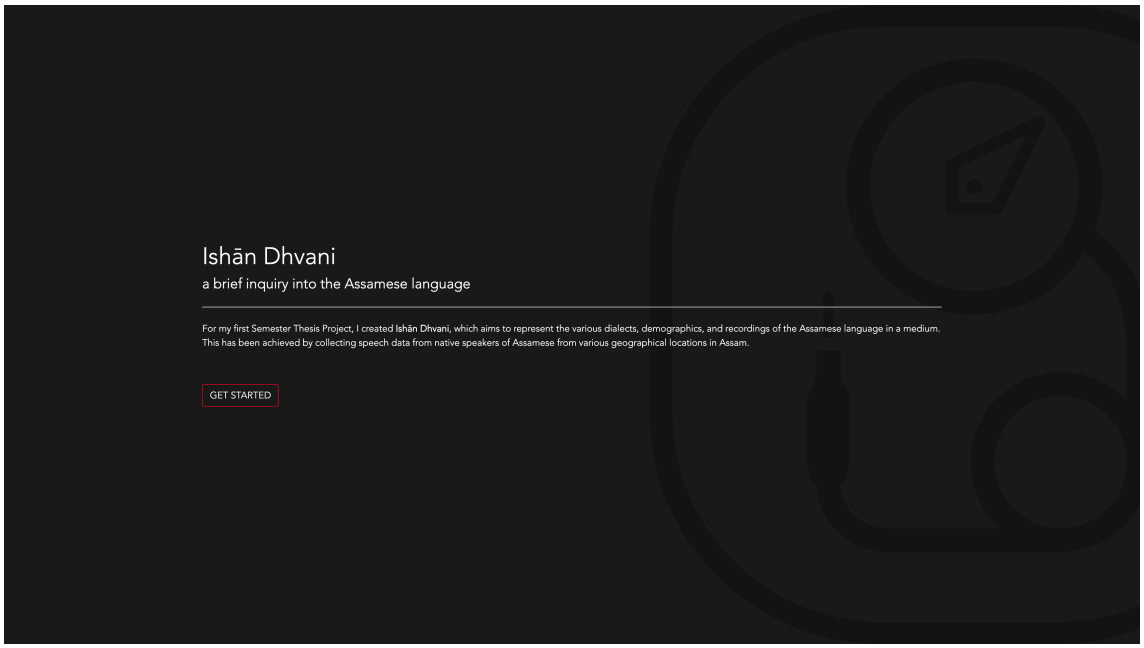

Figure 4: Homepage of Ishan Dhwani

The tabbed design followed the Chunking Theory, first introduced by Miller, G. (1956), to easily differentiate the functions. We used different colours for different screens to indicate the data it's providing. Green, being subtle, was used to showcase the words. Red was used to indicate sound data as it's stimulating. Blue was encompassed in dialects to show the abundance of varieties.

6.1 Details of the concept

The design consists of 3 screens - Dialects, Listen, and Words.

In the Listen tab (Figure 5), the user can listen to speech recording from various districts of Assam. Districts on-click show a pop-up where multiple play buttons are placed meticulously.

The Dialects tab (Figure 6) shows the different dialects across the state. One

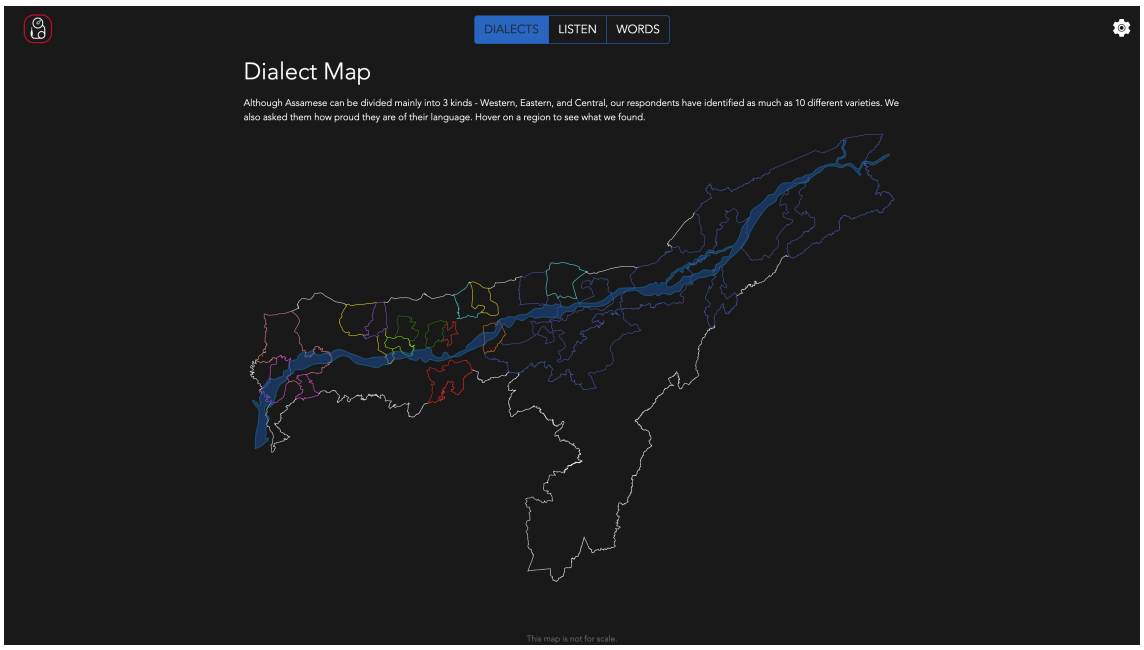

Figure 5: Dialect page of Ishan Dhwani

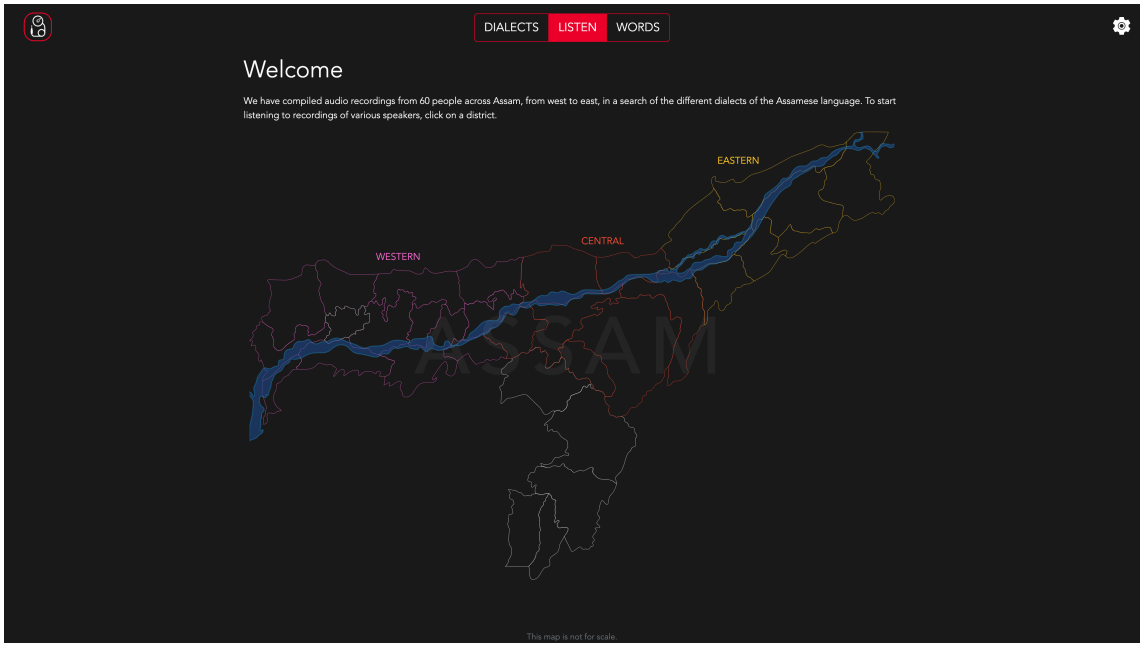

Figure 6: Listen page of Ishan Dhwani

can hover over a region to see what variety they speak, their popularity and how proud they are of their language.

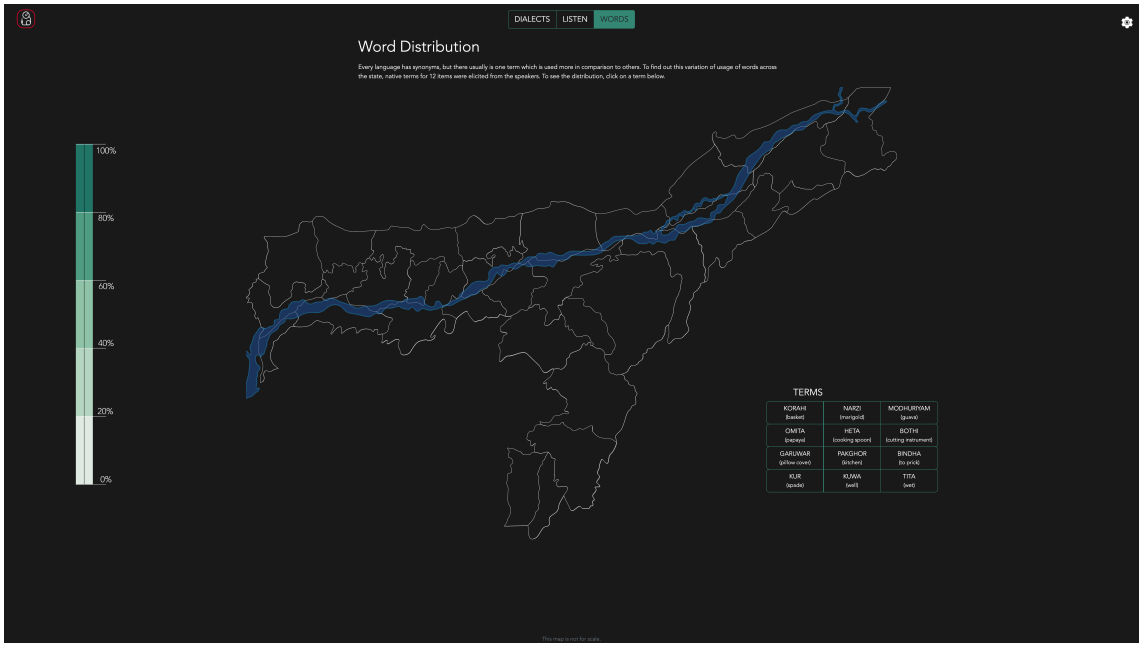

Figure 7: Words page of Ishan Dhwani

The Words tab (Figure 7) shows the distribution of lexical terms. 12 terms were selected which had multiple synonyms to study the usage of these words in different regions. These terms are put in a table and the distribution is shown using a gradient of green. Lighter shades resembled less popularity and darker for more popularity of the terms.

6.2 Prototyping environment

The platform was developed using HTML5, with Bootstrap 4 as the front-end framework for CSS. JavaScript, accompanied by jQuery library, was used to handle the back-end of the website. It is hosted on GitHub pages.

7 Peer review

A total of 5 feedback sessions were organized with the project supervisors. Following are the highlights of these sessions:

7.1 Session 1 (4th Mar 2020)

- Concept sketches of the design were shown.
- Developing the design for web-platform was suggested.
- "Recording voice of the users" as an idea was discussed. These recorded files can then be processed perhaps through multiple ways in order to derive some interesting insights with respect to the already recorded data.
- "Dynamic Time Warping (DTW)" was suggested as one of the techniques to generate insights out of the available data for implementing this.
- It was concluded that existing platforms like Wix may fail in letting us realize the full features of the design. Hence, it was resolved that we will begin afresh by learning some new technologies and coding techniques.

7.2 Session 2 (26th March 2020)

- Low fidelity prototypes of the design were shown.
- HTML5 combined with CSS and JavaScript were used as the programming language for the interface.
- Bootstrap was suggested as a framework for cross-platform compatibility.
- It was concluded that the platform be hosted at GitHub pages for ease of developmental review.

7.3 Session 3 (7th April 2020)

- First function of the design was implemented and shown. The "Listen" function lets the user listen to various audio recordings taken during the course of the project. It was implemented using the map of Assam and each audio file was mapped to their approximate location.
- It was suggested to create an identity for the project, with a name, tagline, and a logo.
- It was concluded that the current iteration looked visually empty and needed more elements for an overall impactful design.

7.4 Session 4 (23rd April, 2020)

- Second function of the design was implemented and shown. The "Dialects" function lets the user view the various dialects across the state. It was suggested that the level of pride data be shown to represent what the population feels about their own language.

- The name was changed from Dhvani to Ishan Dhvani, which meant "Sound of North-East".

- It was concluded that the design lacked categorisation of its features. Hence, it was resolved by making the tabs properly aligned and the nomenclature of the functions be rethought.

7.5 Session 5 (2nd May 2020)

- The third and final function of the design was implemented and shown. The "Words" function lets the user view the variation of synonyms for particular lexical terms across the state.

- Minor visual tweaks were suggested to improve feedback.

- It was concluded that the phase 1 of the project has been completed.

8 Limitations and future scope

The current limitations of this project are the following -

- Call to Action functions for the user are limited and thus interactions with the user are very minimal.

- Currently, there are no ways to upload audio from the user. This means our project data cannot be crowd-sourced.

- The recordings are short and repetitive, and hence doesn't capture the user's attention for long.

If given the time and energy, a function to record the user's speech can be implemented. This would enhance user intractability and would also serve to crowd-sourced data. Moreover, this speech can be used to compare with other audio to determine his variety.
We would also redesign the interface in such a manner that all data are in one clean space instead of three separate ones. We see the potential in incorporating more information on the screen.
We are currently in the process of filing a patent for the design.

9 Acknowledgements

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