

IBM Z - Datathon

Bootstrap_Samplers

Ananth Narayanan: Team Leader - L1CC Setup and Documentation

Abbhinav Elliah - Data Scientist (Lexical Simplification)

Abhishek Reddy Lingareddy - App architect

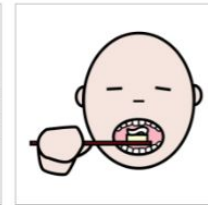
Avaneesh Koushik - LLM Engineer and GitHub Deployment

Shobith Kumar R - Research Scientist and API Integration

Problem Statement

Augmentative and Alternative Communication (AAC)

- Communication for individuals with language impairments, such as those caused by genetic diseases, aphasia, interferes with the development of language skills such as speaking, listening, reading.
- Lack of accessible, affordable AAC tools in India hinders communication and social inclusion for individuals with speech impairments.
- **Existing methods for communication:** manual signs, gestures, finger spelling, tangible objects, line drawings - **Unaided methods (Requires assistance)**
- **Aided methods:** Pictures, computers, handheld devices with symbols that generate speech structure [synthetically produced or recorded natural (digitized) means]



From left to right : "music", "brush the teeth", "what is your name?".



**Bridging Words with Symbols: Empowering
Communication for All**

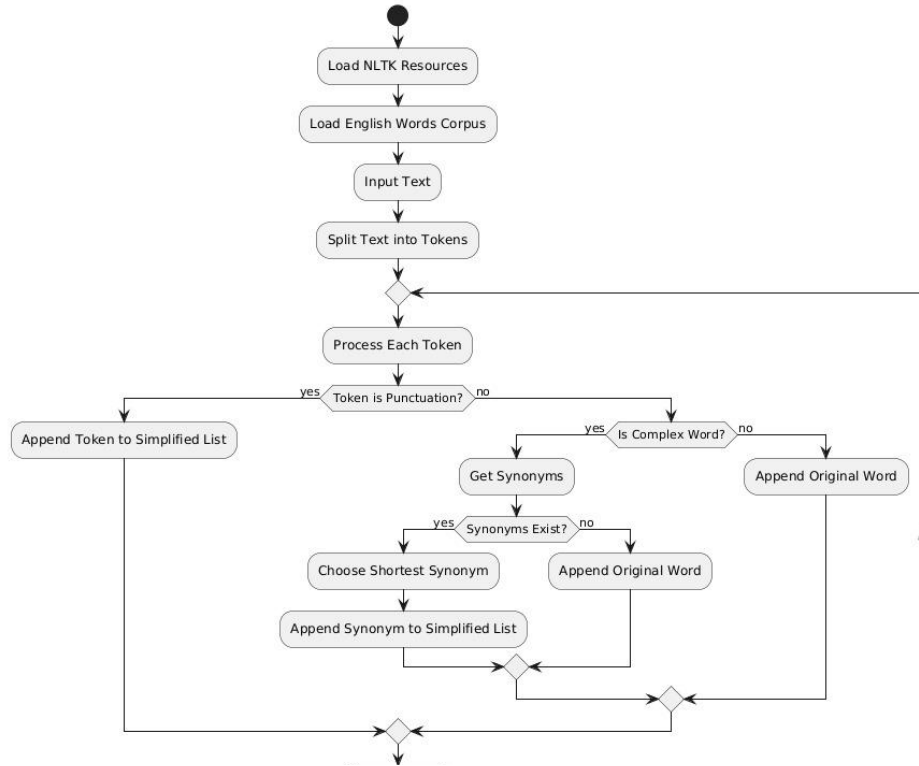
**Context Matters: Accurate, Simple, and
Customizable Pictograms for Everyday
Conversations**

**Empowering Communication: From Speech to
Pictograms with Customization for Every Need**

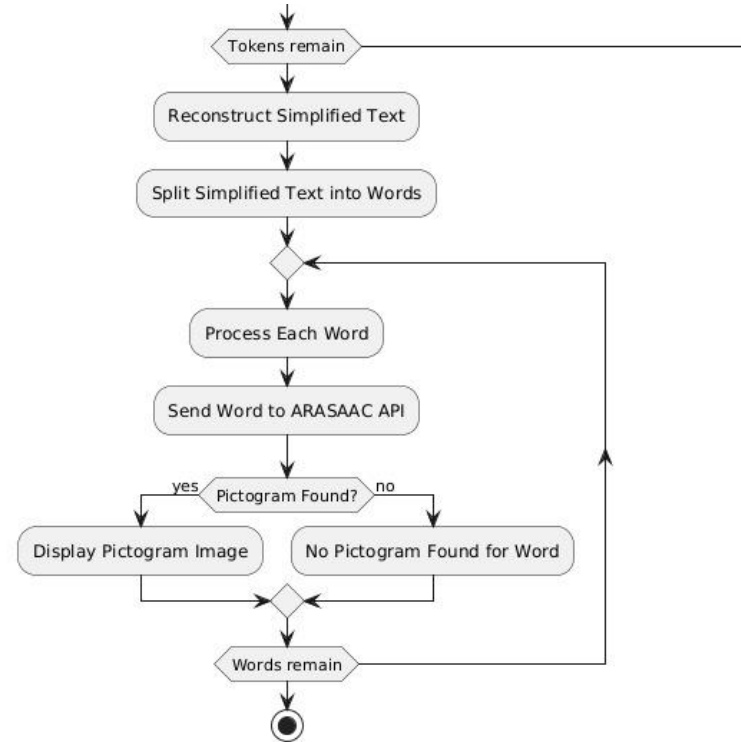
A large pink square containing a white circle, which in turn contains the PixEd logo. The logo consists of the word "Pix" in black and "Ed" in pink.

PixEd

Lexical Simplification and Pictogram Display Process



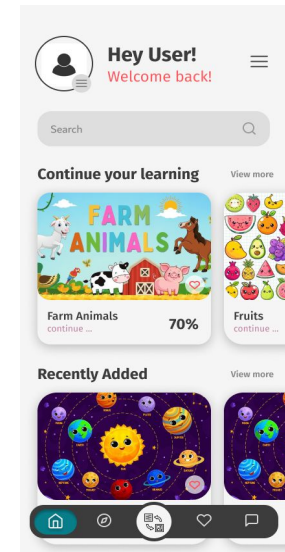
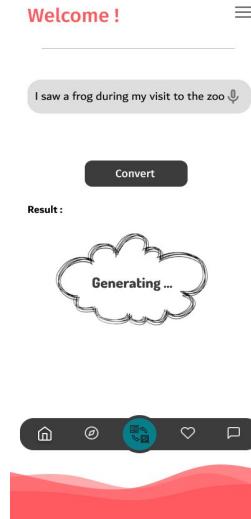
Solution



Solution

1. An app converts English sentences into meaningful pictograms for easy communication by individuals with speech impairments.
2. Utilizes NLP and visual mapping for accurate, context-based pictograms; customizable for user needs and regional languages.
3. Features include speech-to-picto conversion and tutorials, enhancing accessibility for people with disabilities in daily communication.

Model	BLEU	METEOR
3 epochs (T5 model)	66.566	82.895
5 epochs(T5 model)	67.859	83.691
6 epochs (T5 model)	74.363	87.082



Wow Factors

Empowering Voices:

Transforms lives by giving millions a voice to express needs, emotions, and ideas. Boosts language acquisition and academic growth.

Transforming Education:

AAC solutions revolutionize learning for children with disabilities, promoting active classroom participation and academic success.

Cultural Relevance:

Multilingual, culturally adaptive AAC systems allow users to communicate in their native languages, enhancing family and community connections.

Fostering Social Inclusion:

AAC tools break isolation, enabling children to engage socially, fostering friendships, and a sense of belonging in their community.



**Let's Jump into the
Demo!**

Learnings during the Datathon

1. We faced initial challenges in adapting to the L1CC system, but quickly learned to navigate its complexities.
2. Debugging and optimizing our code for L1CC took effort, but it was rewarding to see our solution work.
3. We encountered unexpected hurdles with data handling, which pushed us to think creatively and adapt to the constraints.
4. Collaborating as a team while solving real-world problems was challenging, yet fun, as we learned new techniques together.
5. The datathon taught us resilience—facing obstacles, adapting, and still having fun with every breakthrough we made!