

A decorative graphic on the left side of the slide, featuring a complex network of interconnected nodes and lines. The nodes are represented by various shapes and colors, including blue circles, black circles, and grey circles, connected by thin black lines. The overall shape is roughly rectangular and tapers towards the top.

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Paper Presentation

Theme

Maximizing Technological
Advancements in Research and
Education

Sub-theme

Emerging Digital Technologies and
Artificial Intelligence



Simplification of Aflatoxin Contamination Knowledge Access through Artificial Intelligence Chatbot: AflaChat

Presented by Pamela Chogo





SIMPLIFICATION OF AFLATOXIN CONTAMINATION KNOWLEDGE ACCESS THROUGH ARTIFICIAL INTELLIGENCE CHATBOT: AFLACHAT

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Sponsor

Tanzania Initiative for Preventing Aflatoxin
Contamination (TANIPAC) Project

Presentation Contents

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- Food security awareness is important for the society.
- This helps reduce food loss, protect food nutritional value and protection of human health.
- This study addresses food safety and security issue by addressing the lack of aflatoxin contamination knowledge through development of a Natural Language Processing Chatbot.

Introduction



- This chatbot enables aflatoxin contamination knowledge sharing so as to:
 - Create awareness
 - Increase aflatoxin contamination prevention and
 - Enable aflatoxin contamination knowledge management.

Introduction



- What is Aflatoxin (Bediako et al, 2019).
- Contamination stages in the crop value chain (Kumar, P et al, 2017; Asemoloye et al, 2017).
- Crops affected (Al-Zoreky et al, 2017; Kumar, P et al, 2017; Aron et al, 2017).
- Contamination effects (WHO, 2018: Philips et al, 2020: Kumar, 2017).
- Outbreaks in Tanzania (Probst et al, 2007: Kamala et al, 2018: WHO, 2019)

Introduction



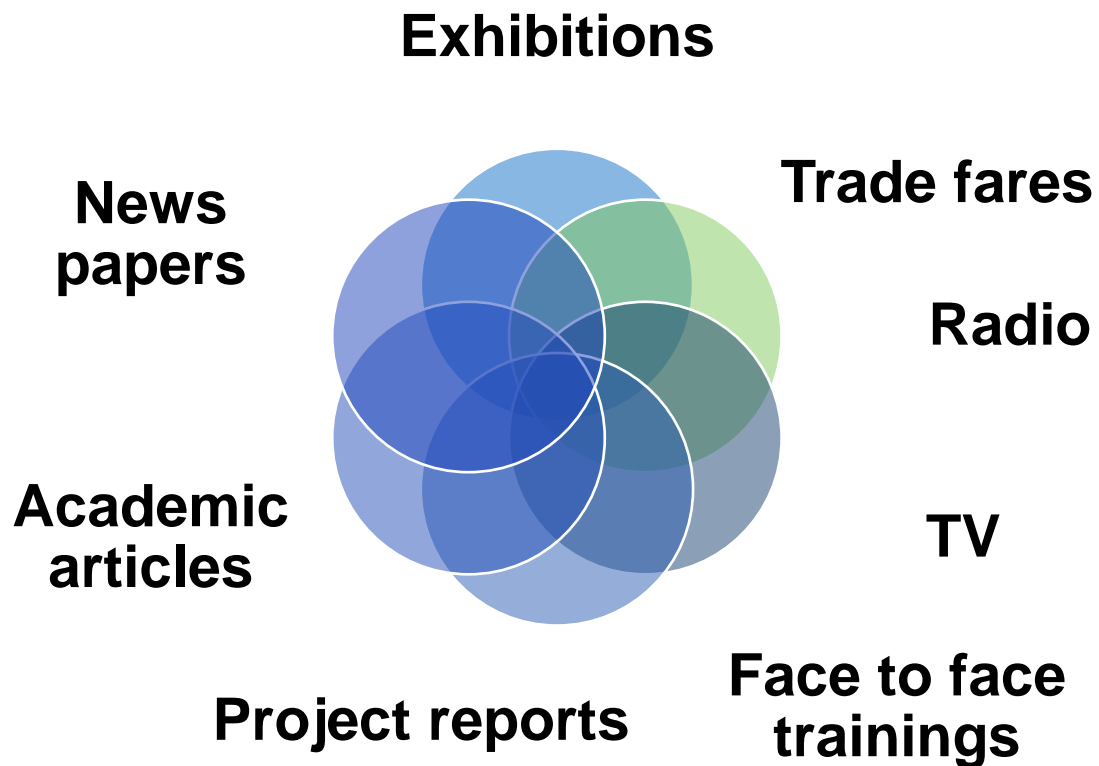
- It is estimated that more than 25% of the world's food supply is contaminated by mycotoxins and up to 4.5 billion people are exposed (Kumar, 2017).
- Studies conducted in Tanzania indicated high levels of aflatoxin contamination on tested crops (Maize and groundnuts) (Kamala et al, 2018: Mollay et al, 2020: Massomo et al, 2020).
- **Lack of awareness and inefficient knowledge sharing is seen to be one of the main contributors of the problems existence** (Fundikira et al, 2020: Ayo et al, 2018: Boni et al, 2021: Lee et al, 2017: Gichohi et al, 2021).

Problem statement

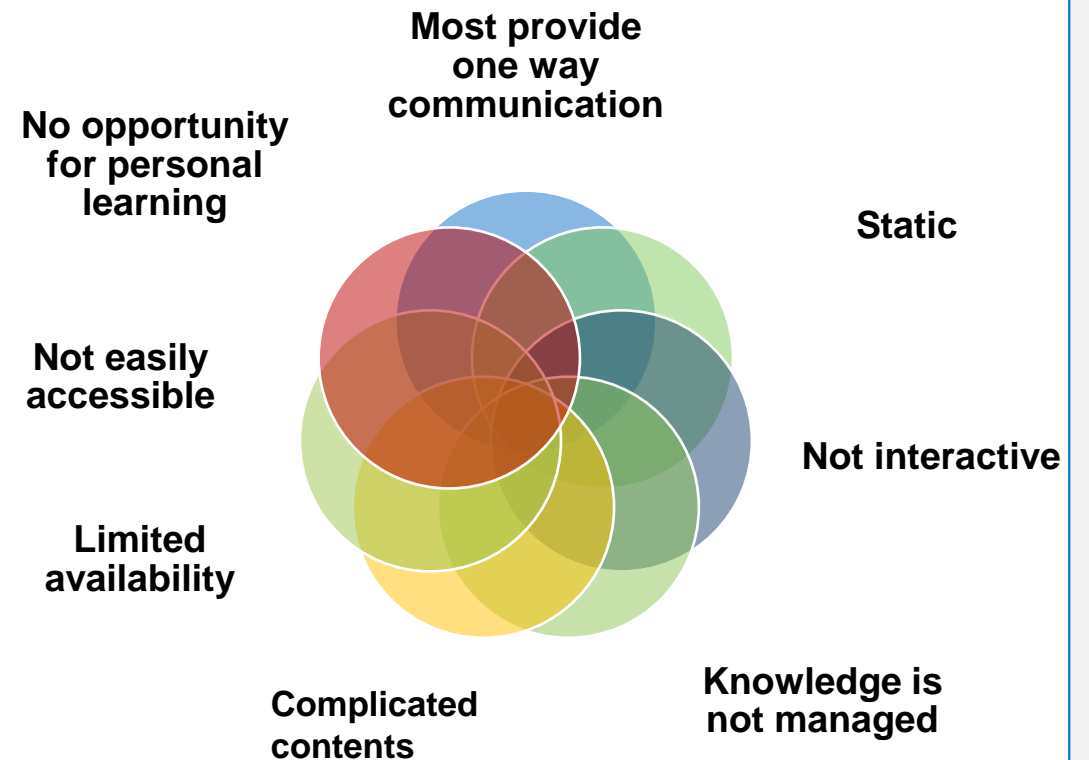


Current Solution

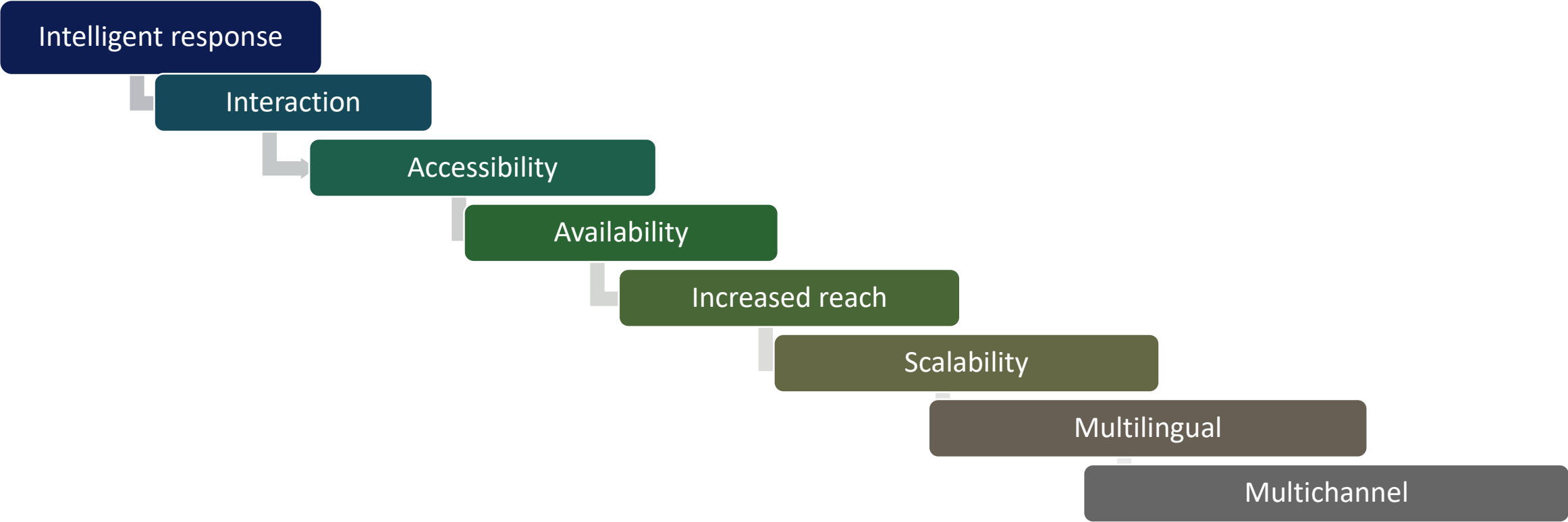
Current aflatoxin knowledge and information sharing methods include:



Challenges with these methods



Artificial intelligence Chatbot offers (Ong et al, 2021; Bharti et al, 2020).



The objective of this study was to
Simplify Aflatoxin Contamination
Knowledge Access through Artificial
Intelligence Chatbot

Study Objective

Methodology

Creating Aflatoxin Knowledge Dataset

Questions collection

- The study area was Dodoma, Iringa, Morogoro, Tabora, Arusha, and Mtwara regions.
- The regions were selected based on their popularity in Maize and Groundnut farming. Random sampling was used to select regions from the 7 agriculture zones in Tanzania.
- 7 FGD sessions were conducted to collect questions from maize and groundnut stakeholders (farmers, traders and consumers). 60 stakeholders participated.
- Data was analysed using RQDA and 6 themes were identified

Answers collection

- Experts and researcher involved were from IITA, TBS, ESRF, TANIPAC and NM-AIST
- Interviews were used to collect the answers, 9 interview sessions were conducted.

Dataset preparation

- Collected questions were matched with respective answers.
- A total of 221 paired questions and answers dataset was created in english language.
- The english dataset was then translated into Swahili language

Chatbot development

Natural Language processing

Chatbot validation

FGD and Interview sessions

1



3



- 1) Tabora
- 2) Arusha
- 3) Dodoma
- 4) IITA

2



4



The background features a vibrant watercolor splash in shades of purple, red, and blue on the left side, and a large, dark blue circular shape on the right side. The text 'Results and Discussion' is centered over the watercolor splash.

Results and Discussion

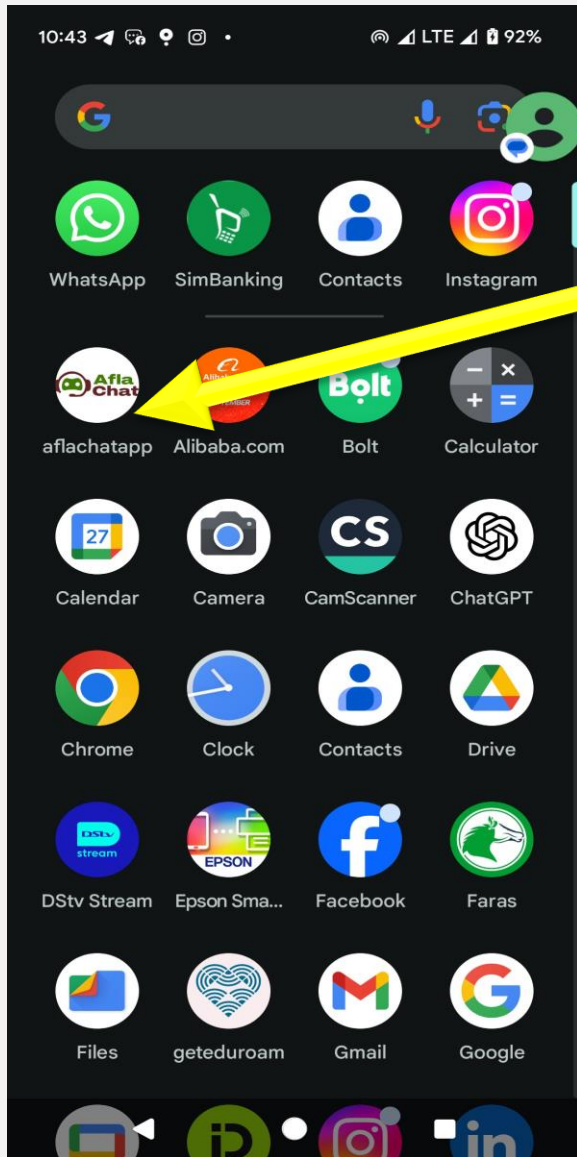
- Aflatoxin knowledge dataset in Swahili and English languages
- It has been published at Mendley Data
- Chogo, P., Kassim, N., Mkoba, E. (2024). Aflatoxin Question and Answer Swahili Dataset (AflaQnASD). Mendeley data. 10.17632/zhpzxpnjfs.1
- Chogo, P., Kassim, N., Mkoba, E. (2024). Identification of Aflatoxin Knowledge Areas for Developing Natural Language Processing Chatbot Datasets. 2023 First International Conference on the Advancements of Artificial Intelligence in African Context (AAIAC). IEEE Xplore, <https://doi.org/10.1109/AAIAC60008.2023.10465309>

Aflatoxin knowledge dataset

- A multilingual text based questions and answers Aflatoxin knowledge chatbot.
- It allows users to ask any question about Aflatoxin contamination and get the response in Swahili and English Languages.

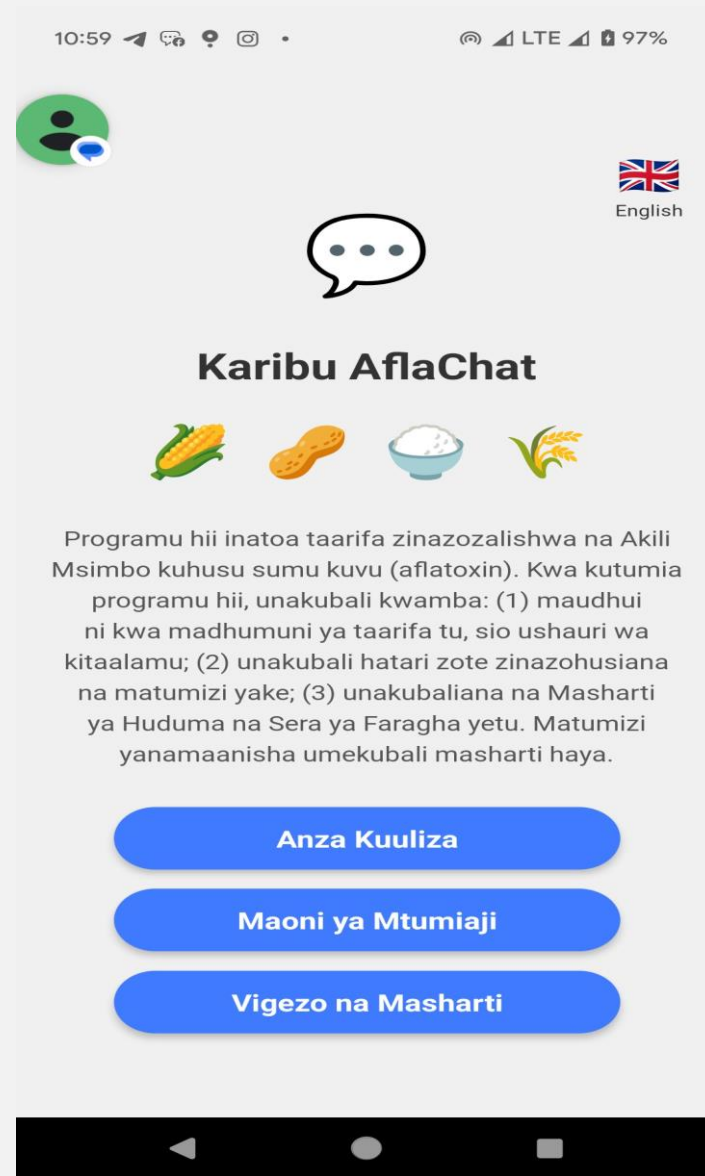
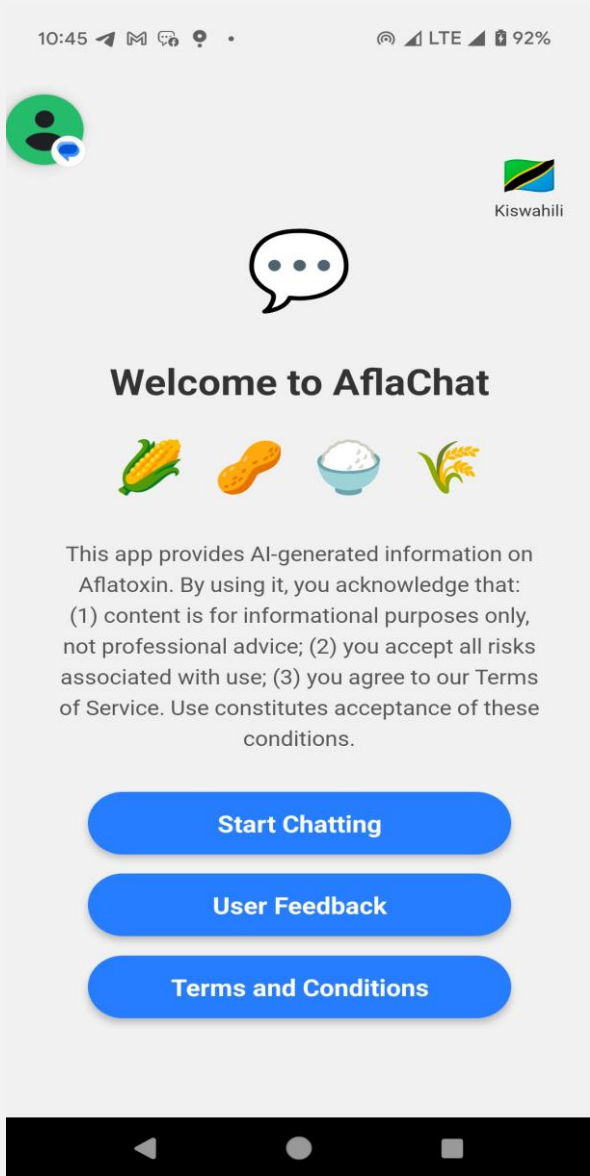
AflaChat Prototype



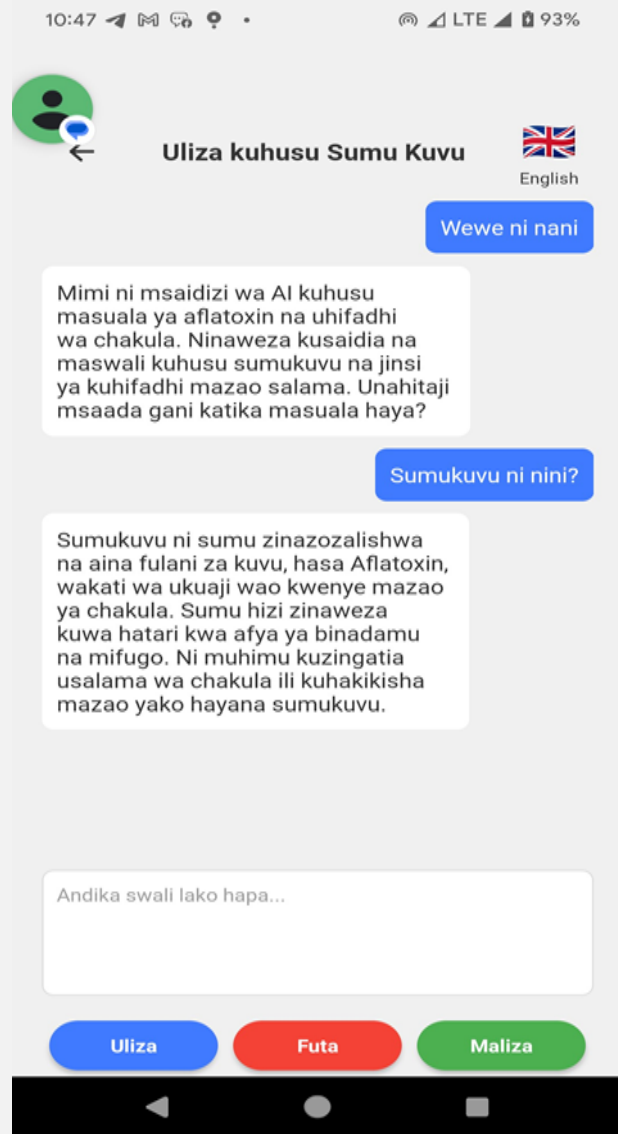
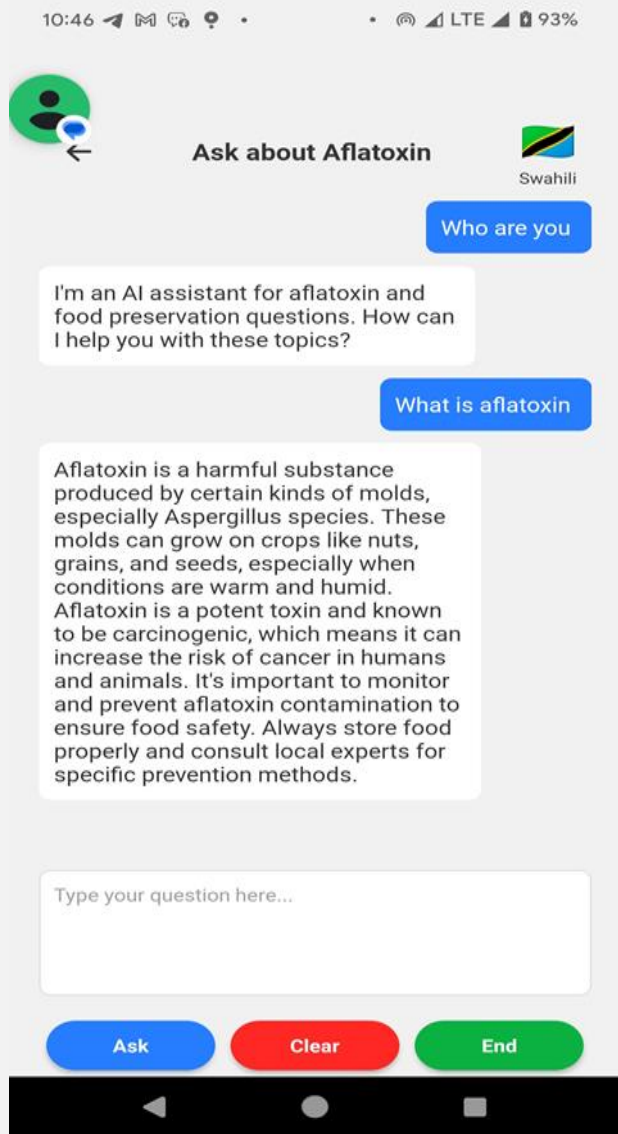


After installing the App on the phone this is how it appears

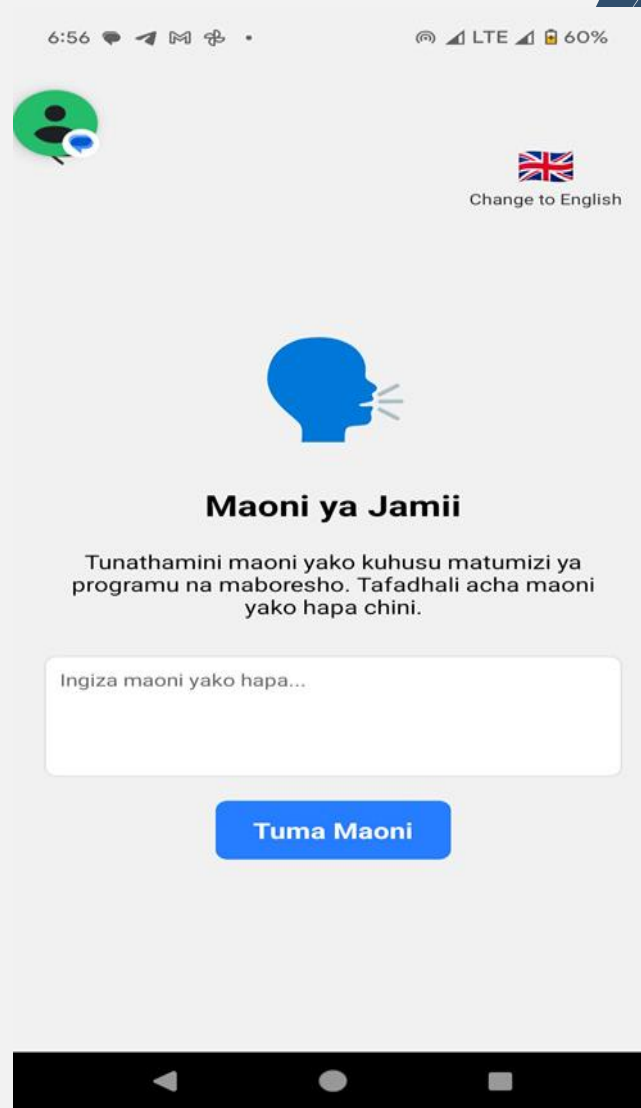
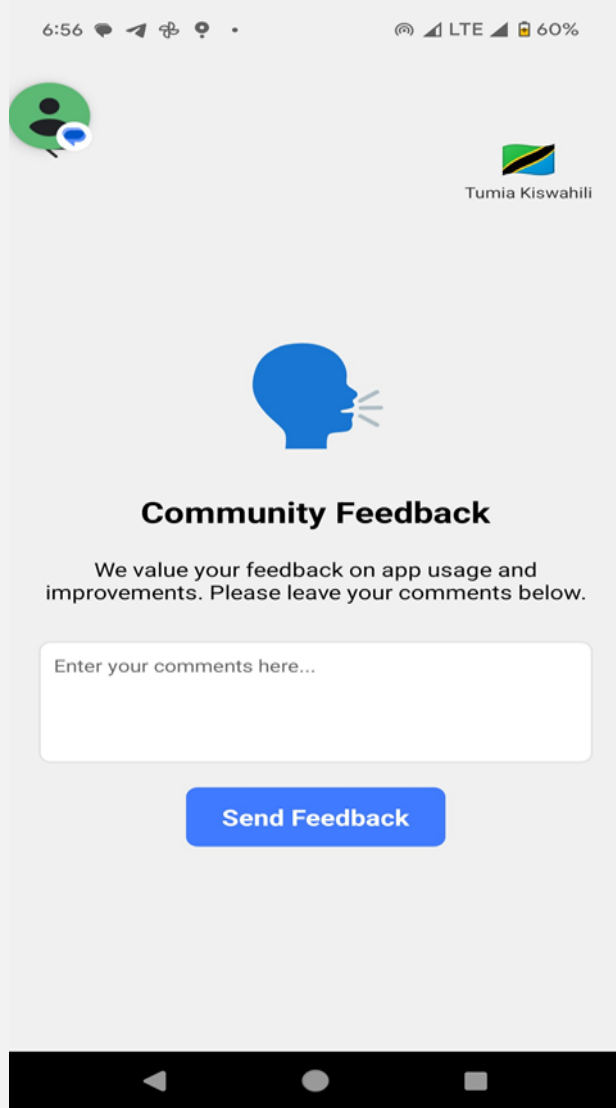
Aflachat Prototype



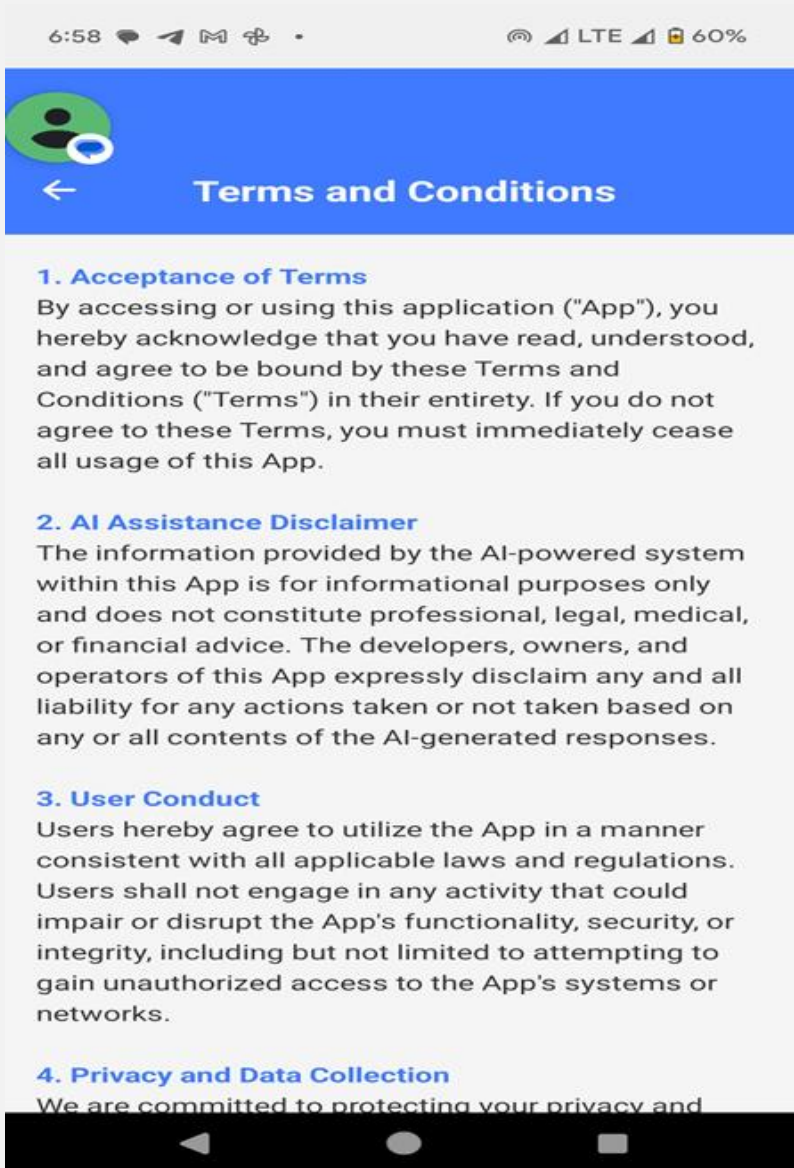
As you start
AflaChat this
is what
comes up



Start
chatting/
Anza kuuliza



User
feedback/
Maoni ya
Mtumiaji



Terms and
conditions /
Vigezo na
masharti

- Study contributes to the body of knowledge through the development of AflaChat: Aflatoxin knowledge chatbot
- The study is limited to the Swahili and English languages. Further studies should extend it to other languages.



Contribution and limitation

AflaChat has been developed following the scientific procedures and ethical guidelines for ChatBot Development. It is expected to give accurate responses and hence simplify access to aflatoxin contamination knowledge. The Chatbot is now in the validation stage.

Conclusion

AflaChat link:

<https://drive.google.com/file/d/1CKlWy6O5NXmKKHcqS-0BDeK3FmtqVW7U/view?usp=sharing>



Conclusion



THANKYOU