# **Documentation**

# **AI Solution (5)**

Taal Tech is a Python-based application designed to recognize and translate South African slang into clear, standardized English in real time.This technology directly tackles ongoing communication obstacles in industries like customer service, tourism, retail, and municipal administration, settings where slang and code-switching often lead to confusion. Utilizing progress in Natural Language Processing (NLP) and machine learning, Taal Tech detects informal phrases, understands their cultural significance, and translates them into formal English while maintaining both meaning and purpose.

In relation to the theme, *“An AI Solution for Industries,”* Taal Tech presents a strong instance of the effective implementation of Fourth Industrial Revolution (4IR) technologies to enhance communication efficiency, accessibility, and precision within regional industries. Through the automation of informal speech translation, organizations can reduce miscommunication, optimize service delivery, and improve client satisfaction. Taal Tech empowers those who are at the frontlines in the municipality to reach out to diverse communities, for example youth and non-native English speakers. This is the type of innovation that enables industries to apply AI to achieve better communication, better service outcomes and enhanced community engagement.

# **Business Objectives (25)**

## Business Objectives:

1. **Improving Communication Clarity**

* Real-time translation of South African slang and code-switching into standard English significantly reduces misunderstandings.

1. **Promoting Inclusivity**

* Promotes efficient communication for businesses, municipal services, and tourism sectors
* Ensures accessibility for diverse communities, non-native English speakers, and visitors

1. **Maintaining Cultural Context**

* Precisely understands slang and casual phrases while maintaining tone and context.
* Maintains the original intent and meaning in translation, supporting authentic communication

1. **Enhancing Service Effectiveness**

* Enables real-time, context-sensitive translations, thereby decreasing average response and resolution times in customer support, public services, and e-commerce.
* Aids in simplifying communication procedures, leading to improved service delivery

## Business Success Criteria:

* Achieve at least 85% translation accuracy in slang-to-English tests.
* Reduce Average Handling Time (AHT) in support scenarios by at least 15%, improving overall response efficiency.
* Increase Customer Satisfaction (CSAT) scores by at least 20% during trials, with a specific focus on channels where slang is frequently used.
* Accurately detect and process at least 90% of slang terms present in test datasets, including recognition of regional slang variations.
* Maintain system response time of 1 second or less for text translations.

## Business Background:

South Africa’s language diversity combines English with isiZulu, isiXhosa, Sesotho, Afrikaans, and changing township slang. In customer-facing industries, this complexity can cause issues when frontline staff or automated systems cannot understand slang terms. Taal Tech addresses this gap with a Python-based AI translator trained on South African language patterns, supporting sectors like retail, tourism, and municipal services.

## Requirements:

**Functional Requirements:**

* Real-time slang detection using NLP algorithms
* Accurate translation to standard English with context preservation
* User-friendly interface for both web and mobile platforms
* Integration capabilities with popular communication platforms (WhatsApp, Teams, Email)
* Multi-user support with personalized learning capabilities
* Offline functionality for basic translation features
* Voice-to-text and text-to-speech capabilities for accessibility

**Non-Functional Requirements:**

* System availability of 99.5% uptime
* Support for minimum 1000 concurrent users
* Response time under 2 seconds for translation requests
* Secure data handling complying with POPIA regulations
* Scalable architecture supporting future language additions
* Cross-platform compatibility (Windows, Mac, Linux, Android, iOS)

## Constraints:

## Risks:

## Initial Assessment of tools and techniques:

# **Problem Definition (10)**

## What is the problem?

South Africa's multicultural business environment faces critical communication barriers due to widespread use of local slang and colloquialisms. Professional settings frequently feature terms like "eish," "howzit," "sharp," "now-now," and complex township slang from isiZulu, Afrikaans, and Sotho origins. These culturally-specific expressions create misunderstandings between different demographic groups, generations, and international stakeholders. The communication gap results in lost business opportunities, reduced workplace efficiency, customer service failures, and social exclusion. International companies struggle to understand local market communications, while local businesses lose global partnerships due to miscommunication. Educational institutions face challenges when diverse linguistic backgrounds prevent effective communication, impacting learning outcomes. Tourism suffers as visitors cannot comprehend local expressions, leading to poor service experiences. Current translation tools focus on formal language and lack contextual understanding for accurate slang interpretation, perpetuating communication barriers and hindering digital transformation goals.

## How relevant is it to the theme?

This issue sits squarely within the theme of “AI Solution for Industries,” since it impacts sectors like business, education, and tourism and calls for a technological approach rooted in the Fourth Industrial Revolution.

## How beneficial it will be in saving the problem?

Taal Tech will remove language obstacles, boost productivity in the workplace, improve customer support, and enable inclusive communication, aiding municipalities in achieving enhanced citizen interaction and service provision