# Mekelle University

# Mekelle Institute of Technology

# Department of Computer Science and Engineering

Course Name: Entrepreneurship

Business Name: AI-POWERED MEDICAL & LEGAL TRANSLATION SYSTEM
(ENGLISH ↔ TIGRINYA)

Type of business: Technology-Based Translation Service

Prepared by:

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# 1. Introductory Page

- ➢ Name of the Company: AI-Powered Medical & Legal Translation System

- ➢ Type of Business: Technology-based translation service

- ➢ Location: Mekelle City, Tigray

- ➢ Target Clients: Hospitals, clinics, courts, legal firms, NGOs, academic institutions

## 1.1 Nature of the Business

This is a technology startup that utilizes artificial intelligence and machine learning to provide accurate, fast, and secure translations of medical and legal texts between English and Tigrinya. The system will be accessible via web and mobile applications and include API integration for organizations.

## 1.2 Statement of Confidentiality

This document is the intellectual property of the business group and is not to be duplicated, disclosed, or used without written permission.

## 1.3 Goal

To break language barriers in critical sectors such as healthcare and law by offering fast and reliable AI-powered translation solutions.

## 1.4 Objectives

- ➢ Launch an AI-based translation platform tailored to medical and legal domains

- ➢ Partner with 10 institutions in the first year

- ➢ Translate over 100,000 documents in the first year with >95% accuracy

- ➢ Provide training and support to Tigrinya language professionals

## 1.5 Vision and Mission

**Vision:** To be the leading provider of intelligent translation services for underrepresented languages, starting with Tigrinya.

**Mission:** Empower healthcare and legal sectors through real-time, domain-specific language translation powered by artificial intelligence.

## 2. Executive Summary

### 2.1 Description of the Business

This AI-powered system will enable accurate translation of complex medical and legal documents. Our model is fine-tuned using over 100,000 bilingual texts. The system will be provided as a web/mobile app and API service.

### 2.2 Objective of the Business Plan

- ➢ Assess viability and financial sustainability
- ➢ Serve as a roadmap for implementation
- ➢ Attract grants, partnerships, and skilled collaborators

### 2.3 Business Plan Goals

- ➢ Guide project execution
- ➢ Attract funding and institutional support
- ➢ Create a strategic development and expansion path

### 2.4 Group Profile

The founding members are graduating students in Computer Science and Engineering with expertise in AI, NLP, and system design.

### 2.5 Qualifications of the Founders

- ➢ Final-year research projects on NLP
- ➢ Experience with translation datasets and model deployment
- ➢ Collaboration with linguists and healthcare professionals

### 2.6 Market Opportunity

- ➢ No reliable, domain-specific Tigrinya-English translation tools exist
- ➢ Legal and medical sectors urgently require language support
- ➢ Human translation is costly, slow, and inconsistent

### 2.7 Strategy for Success

- Use high-quality, in-domain data
- Offer free NGO access and low-cost institutional subscriptions
- Build trust through model transparency and human-in-the-loop validation

### 2.8 Requirements

**Raw Materials / Inputs**

- Tigrinya ⟷ English legal and medical datasets (100,000+ collected texts)
- Parallel corpora for AI training
- Terminology databases (legal and medical glossaries)
- Pre-trained language models (e.g., NLLB-200, MarianMT, T5)

**Tools and Software**

- AI/ML Frameworks: PyTorch, TensorFlow, Hugging Face Transformers
- Translation Libraries/APIs: Fairseq, OpenNMT
- Data Cleaning Tools: SpaCy, NLTK, Pandas
- Backend Development: FastAPI / Django
- Frontend Development: React / Vue.js
- Database: PostgreSQL / Firebase / MongoDB
- Deployment Platforms: AWS, Azure, or local hosting (Linux server)
- Model Optimization Tools: ONNX, quantization libraries, Docker

**Human Resources**

- AI Developer / NLP Engineer
- Full-Stack Developer
- Data Annotators / Linguists
- Legal & Medical Advisors (for dataset validation)
- Business & Marketing Manager

**Office Equipment & Infrastructure**

➢ Laptops / PCs with GPUs (or access to cloud GPUs)

➢ Internet router / Wi-Fi setup

➢ Printers, desks, chairs

➢ Electric power backup (optional)

**Digital Infrastructure**

➢ Official Website & App Hosting

➢ Business Email & Cloud Storage (e.g., Google Workspace, Git Hub)

➢ Customer Support Tools (Chatbot, Email, CRM)

**2.9 Contribution to Local Economy**

➢ Enhances access to health and legal services

➢ Trains local language experts and developers

➢ Creates technical jobs and promotes digital inclusion

## 3. Industry Analysis

**3.1 Outlook & Trends**

➢ Increasing demand for localized digital services

➢ Growth in AI applications for African languages

➢ Government push for digital transformation

**3.2 Competitor Analysis**

| Competitor | Strengths | Weaknesses |
|---|---|---|
| Google Translate | Fast, multilingual, user-friendly | Lacks legal/medical accuracy |
| Microsoft Translator | Enterprise support, Office integration | Lacks domain-specific training |
| Local Translators | Deep cultural knowledge | Expensive, slow, limited scalability |
| NGO-based services | Free or low-cost for local institutions | Manual; lacks real-time functionality |

### 3.3 Market Segmentation

➢ Clinics & Hospitals

➢ Law firms & courts

➢ Humanitarian agencies

➢ Academic institutions

### 3.4 SWOT Analysis

| Strengths: | Weaknesses: |
|---|---|
| • Proprietary in-domain dataset<br><br>• Multilingual AI expertise<br><br>• Tigrinya-focused solution<br><br>• Web, mobile, and API access options | • High computing and infrastructure costs<br><br>• Limited public trust in AI-generated translations<br><br>• Relatively new team with limited track record<br><br>• Need for continuous data updates and retraining |
| Opportunities: | Threats: |
| • Expand to Amharic, Oromo, Somali translation systems<br><br>• Government digital services integration<br><br>• Educational partnerships and research applications<br><br>• Local and international funding opportunities | • Political instability disrupting operations<br><br>• Entry of well-funded international competitors<br><br>• Data privacy concerns in sensitive domains<br><br>• Potential regulatory hurdles for medical/legal AI tools |

## 4. Description of the Company

### 4.1 Description of the Product/Service

- ➢ AI model for English-Tigrinya translation
- ➢ Cloud-based web and mobile applications
- ➢ Secure API for organizational use

### 4.2 Business Size

- ➢ Initial team of four
- ➢ Office and operations based in Mekelle Tech Hub
- ➢ Scalable via cloud infrastructure

### 4.3 Background of Entrepreneurs

We are graduating students in Computer Science and Engineering from Mekelle University, specifically based at the Mekelle Institute of Technology (MIT), Tigray, Ethiopia. Our team is highly passionate about solving real-world language accessibility problems using AI.

Throughout our academic journey, we have actively participated in building and fine-tuning AI-powered translation systems for low-resource languages. These efforts have equipped us with practical experience in data preparation, machine learning, system design, and deployment.

Our diverse skills and collaborative spirit have laid a strong foundation to become successful entrepreneurs committed to the technological advancement of our community.

**General Manager:** Oversees all aspects of the translation system, including budgeting, cloud infrastructure, and deployment logistics.
**Technical Lead:** Manages AI model development, training, and integration into backend systems.
**Marketing Supervisor:** Handles product awareness, institutional partnerships, and user engagement strategies.
**Finance Officer:** Manages budgeting, funding allocations, payrolls, and overall cash flow.

## 5. Marketing Plan

(a) **Sales Forecast**

The following sales forecast outlines the projected sales for the AI-powered Medical & Legal Translation System over the first three years. The forecast includes the quantity of services sold, unit price in Ethiopian Birr (ETB), and the total sales for each period.

| Period | Product/Service | UoM | Qty | Unit Price (ETB) | Total (ETB) |
|---|---|---|---|---|---|
| Day/Year 1 | AI-powered Translation System (Medical & Legal) | Subscription | 500 | 1,000 | 500,000 |
| Day/Year 2 | AI-powered Translation System (Medical & Legal) | Subscription | 1,000 | 1,200 | 1,200,000 |
| Day/Year 3 | AI-powered Translation System (Medical & Legal) | Subscription | 2,000 | 1,500 | 3,000,000 |
| Total Sales | | | | | 4,700,000 |

(b) **Distribution**

The distribution of the AI-powered Medical & Legal Translation System will be based on multiple channels to ensure wide accessibility:

Online Platform:

➢ The system will be available via a cloud-based platform, accessible globally through the web and mobile applications.
➢ Users can subscribe and access the service online, with an option for cloud storage of translations.

Partnerships with Healthcare and Legal Institutions:

➢ Strategic partnerships with hospitals, clinics, law firms, and government organizations will be established to offer subscription packages at discounted rates.

Third-Party Resellers:

➢ Partnering with resellers who can distribute the system as part of their value-added services for translation solutions in the medical and legal sectors.

Direct Sales:

> ➢ The business will have a sales team to engage directly with potential customers in the healthcare and legal sectors, offering tailored packages based on specific needs.

(c) **Promotion**

The promotional strategy will focus on raising awareness and generating interest among potential clients in the healthcare and legal sectors:

Digital Marketing:

> ➢ Social Media Campaigns: Regular content, including testimonials, case studies, and infographics on platforms like LinkedIn, Facebook, and Twitter.
> ➢ SEO & SEM: Optimizing the website for search engines to ensure visibility when potential clients search for medical or legal translation services.

Targeted Advertising:

> ➢ Online advertising campaigns targeting specific industries (healthcare, legal) through platforms like Google Ads and LinkedIn Ads.

Partnerships & Affiliations:

> ➢ Collaborating with professional medical and legal associations to offer promotional discounts for members.
> ➢ Sponsoring industry events and conferences to showcase the system and its capabilities.

Free Trial & Demonstration:

> ➢ Offering a limited-time free trial or live demonstration of the AI-powered translation system to potential clients, allowing them to experience its accuracy and efficiency firsthand.

Referral Program:

> ➢ Launching a referral program to incentivize current customers to refer new users, offering discounts or additional features as rewards.

## 6. Organizational Plan

### 6.1 Managing Process

To manage the AI-powered Medical & Legal Translation System (English ↔ Tigrinya) effectively, the management process will involve active participation from all members in key decisions. As a collaborative team, each member will focus on their specific areas of expertise, ensuring that their skills and capabilities are fully utilized for the success of the business. The following organizational chart outlines the responsibilities of each member based on their assigned roles.

**Management Roles**

    **I.    Project Manager (Merha Gebrelibanos)**

Responsibilities:

> ➢ Lead and coordinate the overall operations of the business.
>
> ➢ Oversee the management of AI model development, data collection, and deployment.
>
> ➢ Handle customer relations, business negotiations, and strategic partnerships.
>
> ➢ Ensure compliance with legal and ethical standards.
>
> ➢ Responsible for reporting and tracking business progress.

    **II.    AI & Machine Learning Specialist (Halefom Hailemariam)**

Responsibilities:

> ➢ Design and fine-tune the AI models for medical and legal translation.
>
> ➢ Oversee training, evaluation, and optimization of machine translation models (e.g., NLLB-200, Tigrinya-English).
>
> ➢ Ensure efficient deployment and integration of the AI model with user interfaces and APIs.
>
> ➢ Stay updated on the latest trends and technologies in AI and machine translation

    **III.    Business Development & Marketing Specialist (Merha Gebrelibanos)**

Responsibilities:

> ➢ Develop and implement marketing strategies to promote the translation system.
>
> ➢ Conduct market research to identify potential customers, partners, and competitors.
>
> ➢ Develop business strategies and sales plans.
>
> ➢ Handle communications and public relations with stakeholders.
>
> ➢ Monitor business performance and suggest improvements for growth.

IV.    **Legal & Regulatory Advisor (Kibrom G/her)**

Responsibilities:

- ➢ Ensure the business operates in compliance with relevant laws and regulations.

- ➢ Provide legal advice on intellectual property, contracts, and partnerships.

- ➢ Handle data privacy and protection policies for user data and translation models.

- ➢ Assist in acquiring any necessary licenses or certifications for the business.

V.    **Technical Support & Customer Service Specialist (Tsega Weldegebrieal)**

Responsibilities:

- ➢ Provide ongoing support and maintenance for the translation system.

- ➢ Address user inquiries and issues related to translation accuracy or system performance.

- ➢ Gather feedback from users to improve system functionality and user experience.

- ➢ Conduct training sessions for clients on using the AI-powered translation system

## 6.2 Development Process

I.    Data Collection & Annotation

II.    Model Training & Evaluation

III.    App & API Development

IV.    Testing, Validation, Deployment

## 7. Risk Assessment

| Risk: | Mitigation Strategy: |
|---|---|
| • High Infrastructure Cost<br>• Lack of Adoption<br>• Model Accuracy Issues<br>• Data Privacy Concerns | • Use cloud credits & grants<br>• Run user training & pilot demos<br>• Add human feedback loop<br>• Implement secure encryption |

## 8. Financial Plan

### (a) Startup Capital Needs

| No. | Item/Expense | Description | Estimated Cost (ETB) |
|---|---|---|---|
| 1 | Product Development Tools | AI model hosting, development tools, domain, backend services | 100,000 |
| 2 | Salaries (First 3 months) | Partial payment for developers, engineers, or technical staff | 120,000 |
| 3 | Cloud Hosting & Storage | For deploying and accessing the AI translation system | 60,000 |
| 4 | Office Rent (3 months) | Temporary office space for the team | 30,000 |
| 5 | Marketing & Promotion (Pre-launch) | Logo, branding, flyers, online ads, and campaign setup | 70,000 |
| 6 | Computers & Basic Tech Equipment | Laptops, routers, and other IT accessories | 50,000 |
| 7 | Communication Setup | Website, business email, phone lines | 20,000 |
| 8 | Legal & Licensing Fees | Business registration, IP protection, licenses | 25,000 |
| 9 | Consumables & Office Supplies | Printing materials, notebooks, etc. | 15,000 |
| 10 | Contingency (10%) | For unforeseen costs | 10,000 |
| **Total** | | | 500,000 ETB |

**(b) Total Costs Projection**

| Type of Cost | Items | Total Value (ETB) |
|---|---|---|
| Variable | Salary (Team & Developers) | 300,000 |
| Fixed | Communication | 600,000 |
| | Maintenance Cost (System upkeep) | 60,000 |
| | Consumable Office Materials | 100,000 |
| | Rent | 50,000 |
| | Utility (Water & Electricity) | 120,000 |
| | Packaging (Digital platforms) | 40,000 |
| | Promotion (Marketing campaigns) | 30,000 |
| | Other Operating Expenses | 150,000 |
| Total | | 1,550,000 |

**(c) Financial Forecast – Income (Profit and Loss Statement)**

| Category | Year 1 (ETB) | Year 2 (ETB) | Year 3 (ETB) | Total (ETB) |
|---|---|---|---|---|
| A. **Sales Revenue** | 900,000 | 2,900,000 | 7,000,000 | 10,800,000 |
| 1. Merchandize / Raw Material | 300,000 | 350,000 | 400,000 | 1,050,000 |
| 2. Salary | 600,000 | 650,000 | 700,000 | 1,950,000 |
| 3. Communication | 60,000 | 70,000 | 80,000 | 210,000 |
| 4. Maintenance Cost | 100,000 | 120,000 | 150,000 | 370,000 |
| 5. Consumable Office Materials | 50,000 | 55,000 | 60,000 | 165,000 |
| 6. Rent | 120,000 | 130,000 | 140,000 | 390,000 |
| 7. Utility (Water & Electricity) | 40,000 | 45,000 | 50,000 | 135,000 |
| 8. Packaging | 30,000 | 35,000 | 40,000 | 105,000 |
| 9. Promotion | 150,000 | 200,000 | 250,000 | 600,000 |
| 10. Other Operating Expenses | 100,000 | 120,000 | 150,000 | 370,000 |
| B. **Total Costs/Expenses (1–10)** | 1,550,000 | 1,780,000 | 2,020,000 | 5,350,000 |
| Profit Before VAT (PBV = A - B) | -650,000 | 1,120,000 | 4,980,000 | 5,450,000 |
| **VAT (15%)** | -97,500 | 168,000 | 747,000 | 817,500 |
| **Net Profit (PAV = PBV - VAT)** | -552,500 | 952,000 | 4,233,000 | 4,632,500 |

**(d) Cash Flow Projections**

| Period | Description | a. Income (ETB) | b. Expense (ETB) | c. Balance (a - b) |
|---|---|---|---|---|
| Starting | Initial Cash | 500,000 | – | 500,000 |
| Year 1 | Sales + Initial Cash | 900,000 + 500,000 | 1,550,000 | -150,000 |
| Year 2 | Sales + Year 1 Balance | 2,900,000 - 150,000 | 1,780,000 | 970,000 |
| Year 3 | Sales + Year 2 Balance | 7,000,000 + 970,000 | 2,020,000 | 5,950,000 |
| **Total** | | 11,270,000 | 5,350,000 | 5,920,000 |

**(e) Break-Even Analysis**

> Fixed Costs (Annual): ~1,250,000 ETB

> Average Subscription Price: ~5,000 ETB

> Break-even Volume = Fixed Costs / Unit Price
> = 1,250,000 ÷ 5,000 = 250 subscribers

So, the business must acquire at least 250 paying subscribers annually to break even.

## 9. References

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# THE BUSINESS MODEL CANVAS

AI-POWERED MEDICAL AND LEGAL TRANSLATION SYSTEM

DESIGNED FOR THE COMPANY    DESIGNED BY : HALEFOM H.    DATE : April 15, 2025

## Key Partners

- Mekelle University (mentorship, infrastructure)
- Local hospitals, clinics, courts
- NGOs and humanitarian organizations
- Linguists, legal and medical professionals
- Cloud service providers (AWS, G.Colab)
- AI communities and open-source contributors

## Key Activities

- Data collection & annotation for Tigrinya ↔ English
- AI model development & fine-tuning
- Web & mobile app development
- Marketing & customer acquisition
- User training and technical support
- Partner onboarding and API integration

## Key Resources

- In-domain translation dataset (100,000+ texts)
- AI/ML tools (Hugging Face, PyTorch, TensorFlow)
- Development tools (FastAPI, React, PostgreSQL)
- Human resources: AI engineers, developers, linguists, advisors
- Cloud infrastructure and computing power

## Value Propositions

- Accurate, domain-specific translations for medical and legal fields
- Real-time access through web/mobile apps and secure APIs
- Cost-effective alternative to human translation
- Support for underrepresented language (Tigrinya)
- Enhances access to justice and healthcare

## Customer Relationship

- Dedicated support through email/chatbot
- Onboarding and demo sessions for organizations
- Feedback loop and continuous improvement
- Referral and loyalty programs

## Channel

- Official website & mobile app
- Institutional partnerships (clinics, courts)
- Conferences and professional networks
- Digital marketing (SEO, social media, LinkedIn)
- Resellers and integration partners

## Customer Segments

- Hospitals and clinics
- Legal firms and courts
- NGOs and humanitarian agencies
- Academic and research institutions
- Government offices

## Cost Structure

- Cloud hosting & infrastructure
- AI development tools and licenses
- Salaries (developers, linguists, support)
- Marketing and promotions
- Office rent and equipment
- Legal and compliance expenses

## Revenue Stream

- Subscription fees from institutions (monthly/yearly)
- API access for integration (usage-based pricing)
- Custom solutions for NGOs or government
- Grants and funding from tech-for-good initiatives