

# Machine Learning-Enabled Translation and Content Management Platform

The application interprets the cultural context of foreign languages, providing accurate translation and transfer of knowledge.





## Project Overview

A multilingual platform that enables users to manage and derive contextual translations of content. The platform leverages machine learning to analyze the structure of foreign languages and displays contextual meanings under each word and sentence. The platform also features an email service that enables users to send and receive messages in the language of their choice.



## Client Profile

Based in Australia, the client provides end-to-end application development, technical talent on-demand, and professional services across the globe.

## Business Requirement

The requirement was to build an application that enables users to upload and translate documents and books. The solution would offer translation of each word and sentence.

- ◆ Three-layer translation
  - ◇ Original text
  - ◇ Word-by-word translation
  - ◇ Contextual translation
- ◆ View alternate suggestions for translations
- ◆ Provide custom user translation
- ◆ Learn user inputs and predict suggestions

## Solution

The platform offers three layers of translation for users. The machine learning engine learns from Microsoft APIs and user inputs to display suggestions.

**Backend:** The uploaded document is parsed and saved along with the formatting style. This is transferred to the NoSQL datastore to ensure quick retrieval of data.



## Machine Learning Translation Engine (MLTE)

- ◆ Utilizes a third-party translation engine (Microsoft's Translation and Dictionary APIs) to provide initial translation
- ◆ Runs machine learning algorithms to incrementally improve accuracy of translations as the size of the dataset (translation results, suggestions, and voting records) increases
- ◆ Captures statistics related to user suggestions using performance model, which enables tracking of submissions from users in addition to understanding top suggestions for words and sentences
- ◆ Stores user suggestions (words and sentences) in the MLTE database
- ◆ Displays suggestions when users move the mouse over words and sentence

**Frontend:** Data from server-side is rendered in a three-layer view. The first layer contains the original sentence that was uploaded from the document. The second layer contains translation of each word in the original sentence. The third layer contains the contextual translation of the original sentence.

## Key Features

- ◆ Translation in multiple languages such as English, French, German, Russian, Spanish, Portuguese, Italian, and Chinese
- ◆ Upload document and select language combination
- ◆ Create personal library to manage user content
- ◆ Customize meanings, layers displayed, and translate to other languages
- ◆ Bookstore with genre and language filter
- ◆ Download customized meanings and layers as PDF
- ◆ Provide user suggestions for translations and view translations provided by other users
- ◆ Email two or more parties with differing primary languages

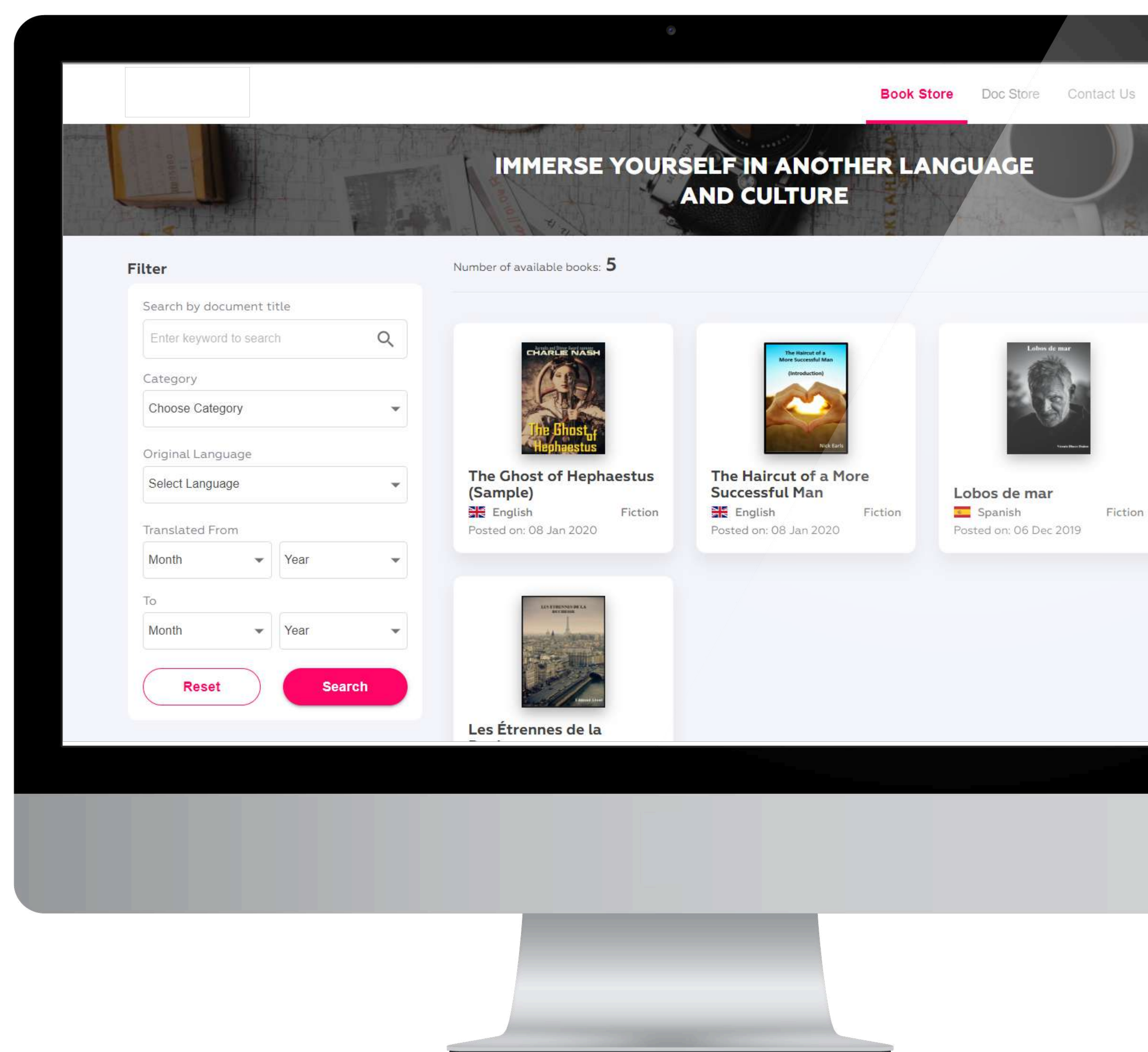


## Technologies

- React-Redux
- Django
- PyTorch
- Material UI
- MongoDB
- Python
- Cassandra

## Business Benefits

- Faster and accurate translation with enhanced machine learning support
- 35% increase in user engagement
- Easily customizable and scalable



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