Functional Document

1. Introduction

The Location-Based Recommendation System project **aims to revolutionize personalized recommendations by leveraging advanced deep learning techniques**. This sprint focuses on addressing the growing demand for personalization, enhancing accuracy, and moving beyond traditional methods that often yield generic suggestions. By integrating Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) to analyse user interactions and spatial-temporal patterns, the project seeks to deliver highly customized and context-aware recommendations.

2. Product Goal

The primary goal of this sprint is to **enhance the recommending precision** and **provide personalized experience** contributing to the overarching **objective of providing seamless online shopping.**

3. Demography (Users, Location)

Users:

- **Target Users:** Online shoppers, including individual consumers and small business owners.
- **User Characteristics:** A diverse demographic spanning various age groups, from tech-savvy millennials to older adults, with differing levels of online shopping experience and technical proficiency.

Location:

- **Target Location:** Major cities across India, including metropolitan areas and emerging urban centres, to optimize recommendations based on local preferences and shopping behaviours.

4. Business Processes

The key business process include:

User Registration and Authentication:

A secure process for users to register and authenticate their accounts, ensuring a seamless onboarding experience for online shoppers.

Location Discovery:

A process that enables users to search, filter, and explore personalized location-based recommendations for products and services, tailored to their preferences and local trends.

Recommendation Management:

A process for the system to analyse user interactions and contextual data using a hybrid CNN and LSTM model, continuously refining and managing location recommendations based on user behaviour and spatial-temporal patterns.

5. Features

This sprint we will be focusing on key feature:

Feature: **Model Training and Prediction:**

1. Description

- Train a hybrid CNN and LSTM model using the Amazon dataset to analyse user interactions and spatial-temporal patterns.
- This feature will enhance the system's ability to deliver accurate and personalized location-based recommendations in Indian cities.

2. User Story

- As an online shopper, I want to receive tailored product recommendations based on my location and shopping history, so that I can discover relevant products that fit my preferences.

6. Authorization Matrix

Role	**Access Level**
Administrator	Full access to user management, recommendation settings, and system analytics.
Data Scientist	Access to model training, evaluation, and prediction tools.
Seller	Access to product management, sales analytics, and location-based promotion tools.
User	Access to personalized recommendations, account settings, and purchase history.
Guest User	Limited access to browse available products and view public recommendations.

7. Assumptions

- The development environment and infrastructure will remain stable during the sprint.
- The dataset made is comprehensive and representative of shopping behaviours in Indian cities.
- Team members possess the necessary skills and resources to implement and optimize the hybrid CNN and RNN(LSTM) models.
- Adequate testing and validation resources are available to ensure the accuracy of the recommendations generated by the system.