Industry	E-Commerce
Use Case Title	AI based Search Engine and Recommendation System
About the Customer	An upcoming e-commerce company which sales Groceries, Fruits, Vegetables and house hold items online.
Business Problem	E-commerce is a rapidly growing industry; the Indian online grocery market is expected to grow at a compound annual growth rate of 37.1% from 2021 to 2028 to reach USD 38.9 billion by 2028. In such challenging cases, every firm working in this industry needs to be more adaptive towards new emerging tech. Therefore, the customer had 3 major requirements: • AI based Search Engine: The customer had an old SQL based approach for their search engine. This search engine needed to be improved and transformed into an AI based search engine. • Recommendation System: Building a recommendation system based upon past purchase and browsing history of a customer. • Top Selling Products: To reflect the top selling products on the website based on RFM methodology.
Solution	The overall solution approach is described below. **Stats:** • Various approaches were tried out for improving the search engine. • Additional functionality was introduced to search in 10+ different languages. • Synthetic Data was generated for recommendation system. • Top selling products were calculated from around 5000+ products on the website. **Deployment**: Azure cloud-based Linux server. **Implementation**: • A combination approach of elasticsearch and semantic search was used to improve the search engine. Various approaches were tried out using Google's Universal Sentence Encoder, Fasttext, BERT, GPT etc. • An additional functionality of searching in different languages was introduced in the search engine making it different from all other search engines present in ecommerce industry. To achieve this, Google translate library was integrated with the combinational search. • The data needed to build the recommendation system was not sufficient, therefore Gretel.ai tool was used to generate synthetic data. • Further, RFMV methodology (Recency, Frequency, Monetary, Variety) approach was used to define the clusters of customers with similar purchase and browsing interests.

	- Therefore, three matrices were created based upon the clusters i.e., Item-User, Item-Item, User-User matrices which were basically used to train the recommendation model. - To find out top 20 selling products from website, RFM methodology was used which were further assigned a top selling score and sorted into descending order. Therefore, the first 20 products were highlighted as the top selling products.
Outcome	- Achieved an improvement in search accuracy by 50%. - Customers visiting the website and having a good purchase history would get a much more personalised recommendation of products to buy meeting their interests. - The top selling products highlighted would make an easy access for the customers to know and would make an indirect impact on customer to buy the item.
Value Adds	- Achieved a 10% increase in Items click through rate. - Decreased the time spent searching for items by 25%. - Improved user engagement by 20%.