Intelligent Routing System For Customer Support

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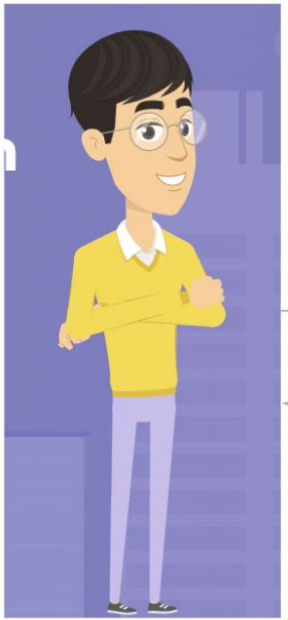
Problem Statement



John

Company A

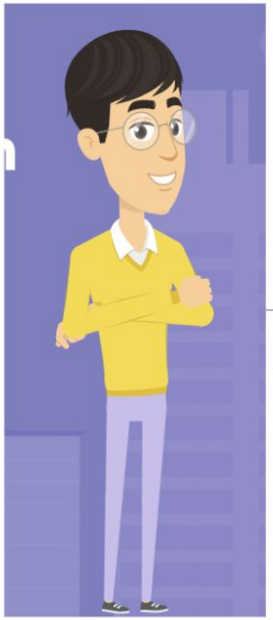
Service request

Company A
Customer Support

Response Time??

12 hours 10 minutes!!!!!!

Our Product - Intelligent Routing System



John

Service request

IRS

Ticket Routed to appropriate agent

Company A Customer Support

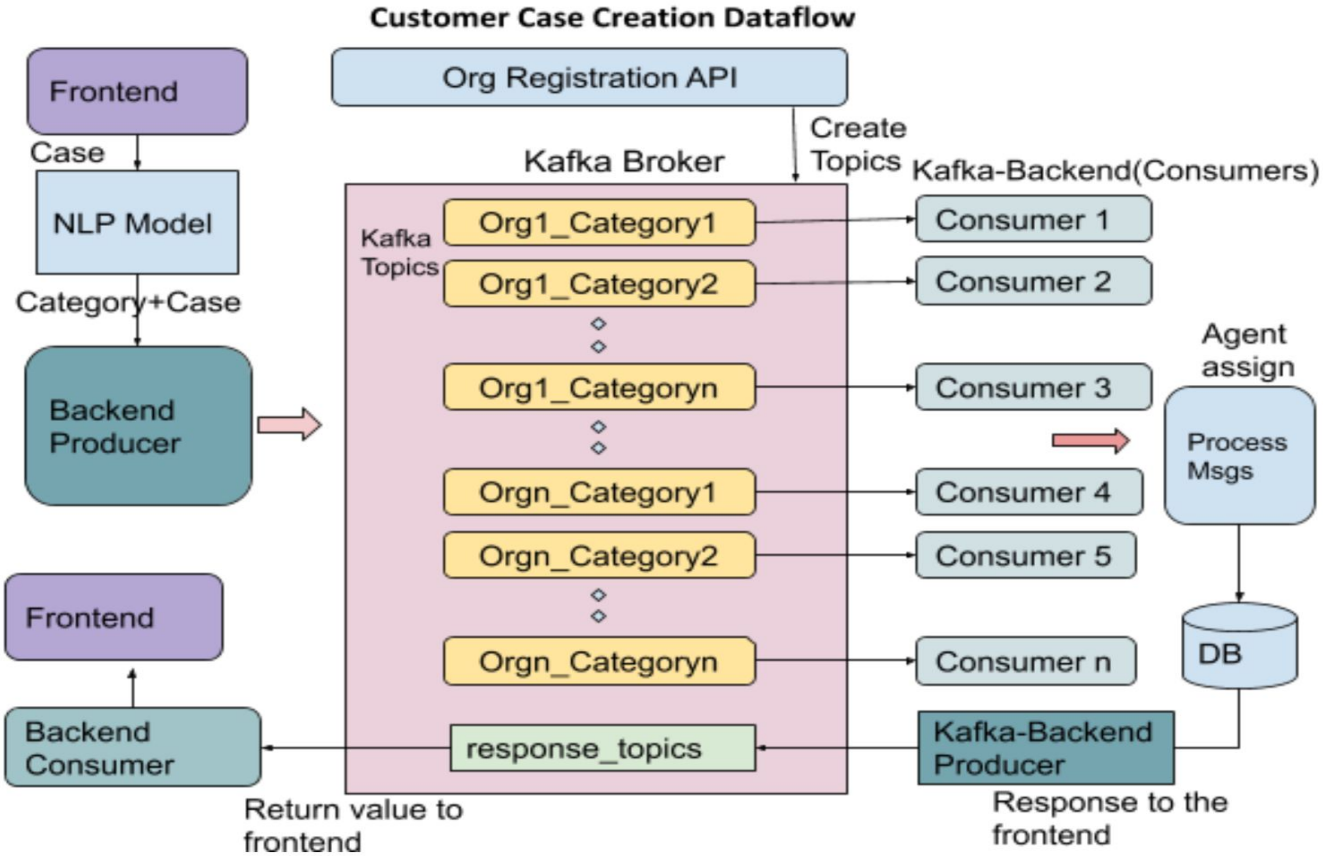
1.5 Seconds to assign case to an agent!!

Introduction

- Intelligent Routing System (IRS) helps in addressing customer issues in a timely manner which ensures customer satisfaction
- Whenever a customer creates a case from the IRS portal embedded in an organization website. Based on the case description provided by the customer, category is predicted by NLP model and routed to the right agent through kafka who can handle cases related to that category
- Whole process of routing the case to a corresponding agent happens in around 1500 milliseconds
- Customer has the capability to add further details after creating case and also can respond to agent’s comments

Intro..

- Email will be sent to the customer for every comment added by the agent to the case. Customer can unsubscribe to a case if he/she doesn’t need notifications.
- Customer can close the case, if he thinks he got the required information from the agent comments
- Agent can update the case status, once he starts working on it.
- Every change on the case will be tracked as case history, which can be viewed by the customer and the agent.


Customer Case Creation Dataflow
Frontend
Case
NLP Model
Category+Case
Backend Producer
Org Registration API
Create Topics
Kafka Broker
Kafka Topics
Org1_Category1
Org1_Category2
Org1_Categoryn
Orgn_Category1
Orgn_Category2
Orgn_Categoryn
response_topics
Kafka-Backend(Consumers)
Consumer 1
Consumer 2
Consumer 3
Consumer 4
Consumer 5
Consumer n
Agent assign
Process Msgs
DB
Kafka-Backend Producer
Response to the frontend
Frontend
Backend Consumer
Return value to frontend

Roles

Agent	Person who will be handling the cases
Customer	Person who will be creating cases from the organization portal
Org Owner	Person who registers an Organization and maintains the agents and category information

Technologies

React - frontend

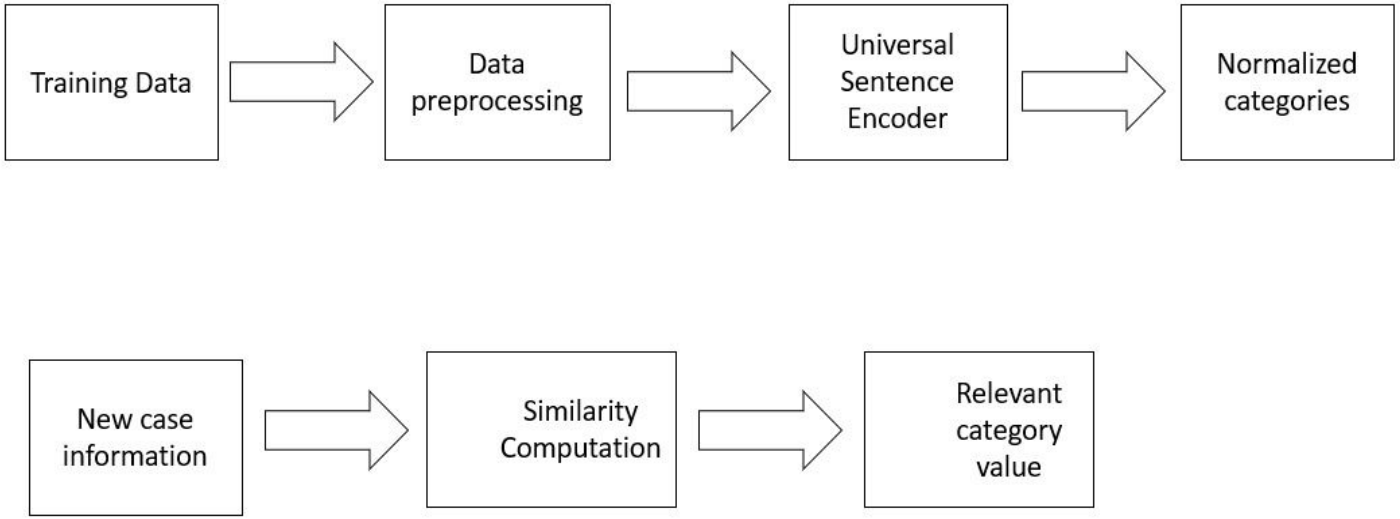
NodeJs - Backend

Python + Flask - NLP Model

Kafka - Topics mapping

AWS - Deployment

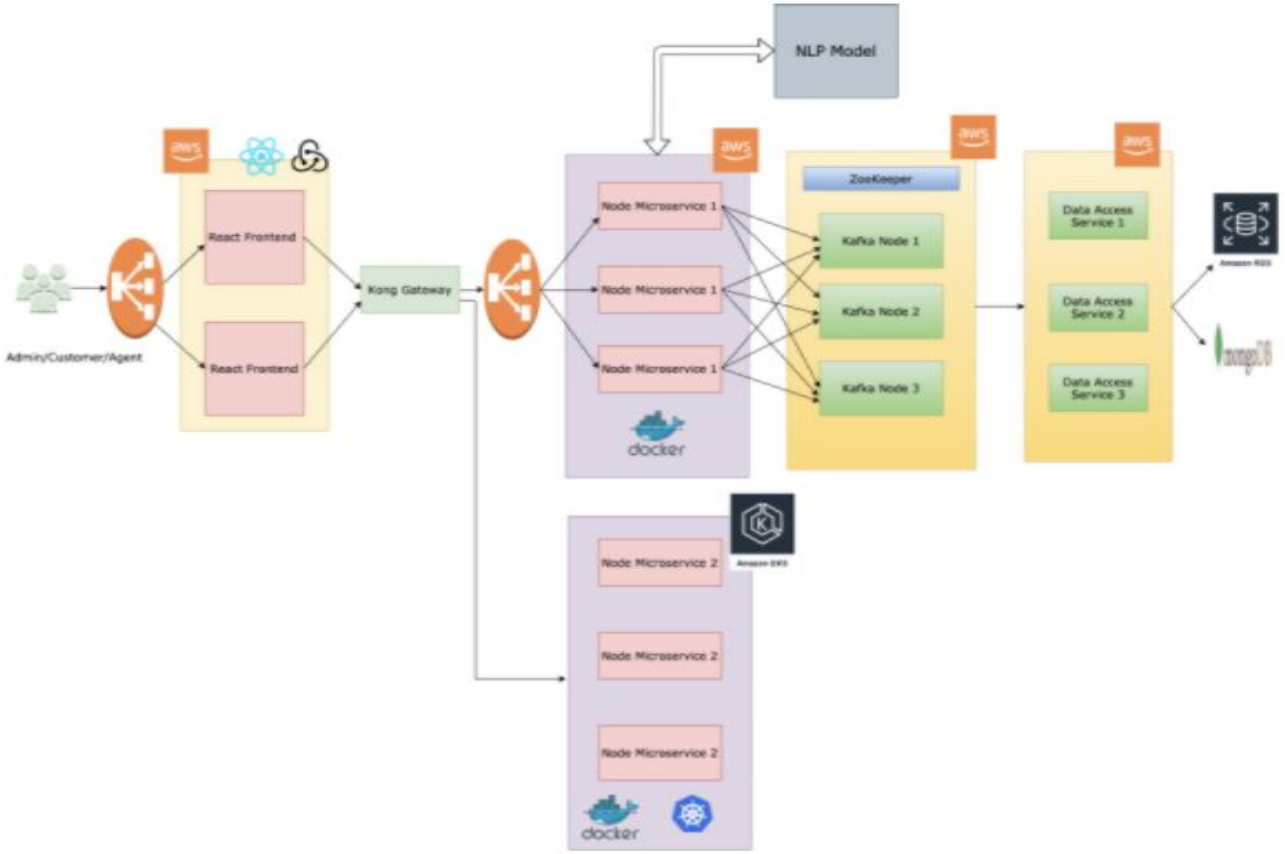
NLP Model


Training Data
Data preprocessing
Universal Sentence Encoder
Normalized categories
New case information
Similarity Computation
Relevant category value

NLP Model

- We had a flask endpoint to take the case info and return the case category.
- Item - Item similarity technique to identify the case category
- We calculated similarity scores with each item in the training data belonging to a specific category and calculated the average score of that item with respect to that category.
- Once we get the average similarity scores with respect to each category.
- We will be returning the category with highest average similarity.
- NLP model is dockerized and will be running on an EC2 Instance

Architecture



Result

- NLP Model => 80% efficient
- Web application => 1500 ms to respond to 1000 concurrent users

Thank you!